2007 Mazda3 MAZDASPEED3 Workshop Manual

FOREWORD

This manual contains on-vehicle service and/or diagnosis procedures for the Mazda3, MAZDASPEED3.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing.
As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), and related materials shown on the following page.

CONTENTS

PRINTED IN U.S.A., JULY 2006
Form No. 1886–1U–06G
Part No. 9999–95–017B–07

VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1 BK123*7#	600001—
JM1 BK124*7#	600001—
JM1 BK12F*7#	600001—
JM1 BK12G*7#	600001—
JM1 BK143*7#	600001—
JM1 BK144*7#	600001—
JM1 BK14L*7#	600001—
JM1 BK14M*7#	600001—
JM1 BK323*7#	600001—
JM1 BK324*7#	600001—
JM1 BK32F*7#	600001—
JM1 BK32G*7#	600001—
JM1 BK343*7#	600001—
JM1 BK344*7#	600001—
JM1 BK34L*7#	600001—
JM1 BK34M*7#	600001—

RELATED MATERIALS

Material Name	MNAO Part No.	Mazda Material No.
2004 Mazda3 Service Highlights	9999–95–064F–04	3385–1U–03I
2005 Mazda3, Mazda MX-5 Miata, Mazda MX-5, MAZDASPEED MX-5, Mazda MPV, Mazda RX-8 Service Highlights	9999–95–MODL–05	3400–1U–04H
2006 Mazda3, Mazda MPV Service Highlights	9999–95–MPV3–06	3408–1U–05G
2007 Mazda3, MAZDASPEED3, Mazda5, Mazda6, MAZDASPEED6, Mazda MX-5, Mazda RX-8 Service Highlights	9999–95–MODL–07	3422–1U–06G
1995, 1996, 1997, 1998, 1999, 2000 OBD-II Service Highlights	9999–95–OBD2–00	3344–1U–99K
Engine Workshop Manual L3 WITH TC	9999–95–0L3T–06	1833–1U–05H
Engine Workshop Manual LF, L3	9999–95–LFL3–05	1866–1U–05H
Manual Transaxle Workshop Manual G35M-R	9999–95–0G35–03	1756–1U–02I
Manual Transaxle and Transfer Workshop Manual A26M-R, A26MX-R	9999–95–A26M–07	1898–1U–06G
Automatic Transaxle Workshop Manual FN4A-EL	9999–95–FN4A–04	1793–1U–03I
Automatic Transaxle Workshop Manual FS5A-EL	9999–95–FS5A–06	1859–1U–05F
2004 Mazda3 Bodyshop Manual	9999–95–036F–04	3386–1U–03J
2007 Mazda3 Wiring Diagram	9999–95–019G–07	5677–1U–06G

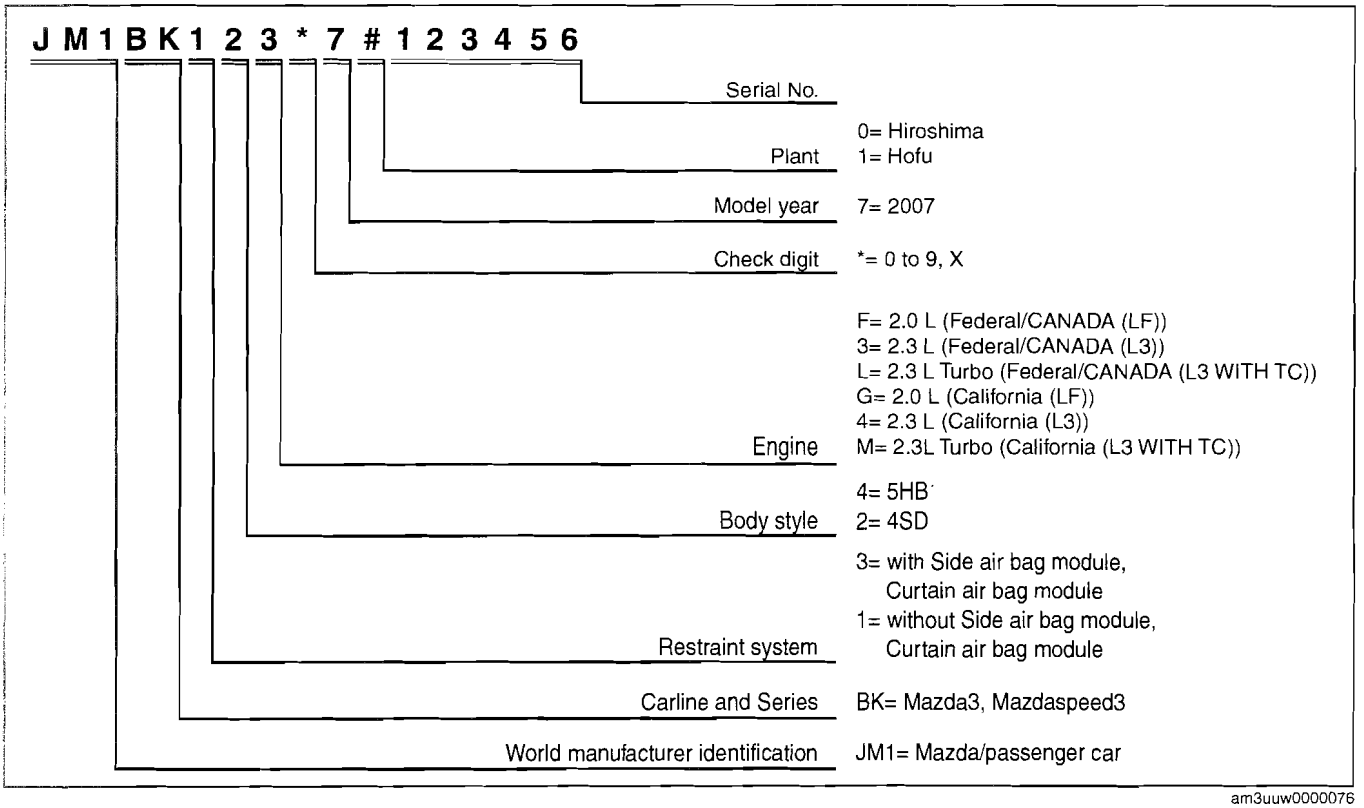
GENERAL INFORMATION

00
SECTION

00-00 GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER (VIN) CODE

id000000100200



am3uuw0000076

VEHICLE IDENTIFICATION NUMBER (VIN)

id000000100300

JM1 BK123*7# 600001—
JM1 BK124*7# 600001—
JM1 BK12F*7# 600001—
JM1 BK12G*7# 600001—
JM1 BK143*7# 600001—
JM1 BK144*7# 600001—
JM1 BK14L*7# 600001—
JM1 BK14M*7# 600001—
JM1 BK323*7# 600001—
JM1 BK324*7# 600001—
JM1 BK32F*7# 600001—
JM1 BK32G*7# 600001—
JM1 BK343*7# 600001—
JM1 BK344*7# 600001—
JM1 BK34L*7# 600001—
JM1 BK34M*7# 600001—

HOW TO USE THIS MANUAL

id000000800100

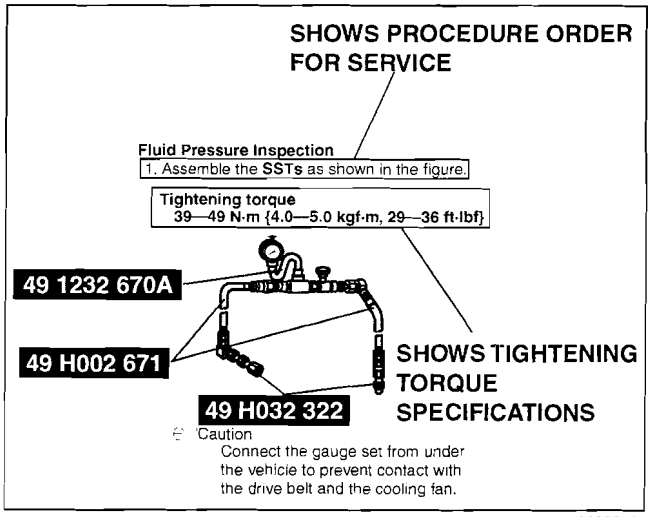
Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  - — Removal/Installation
  - — Disassembly/Assembly
  - — Replacement
  - — Inspection
  - — Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

Service Procedure

Inspection, adjustment

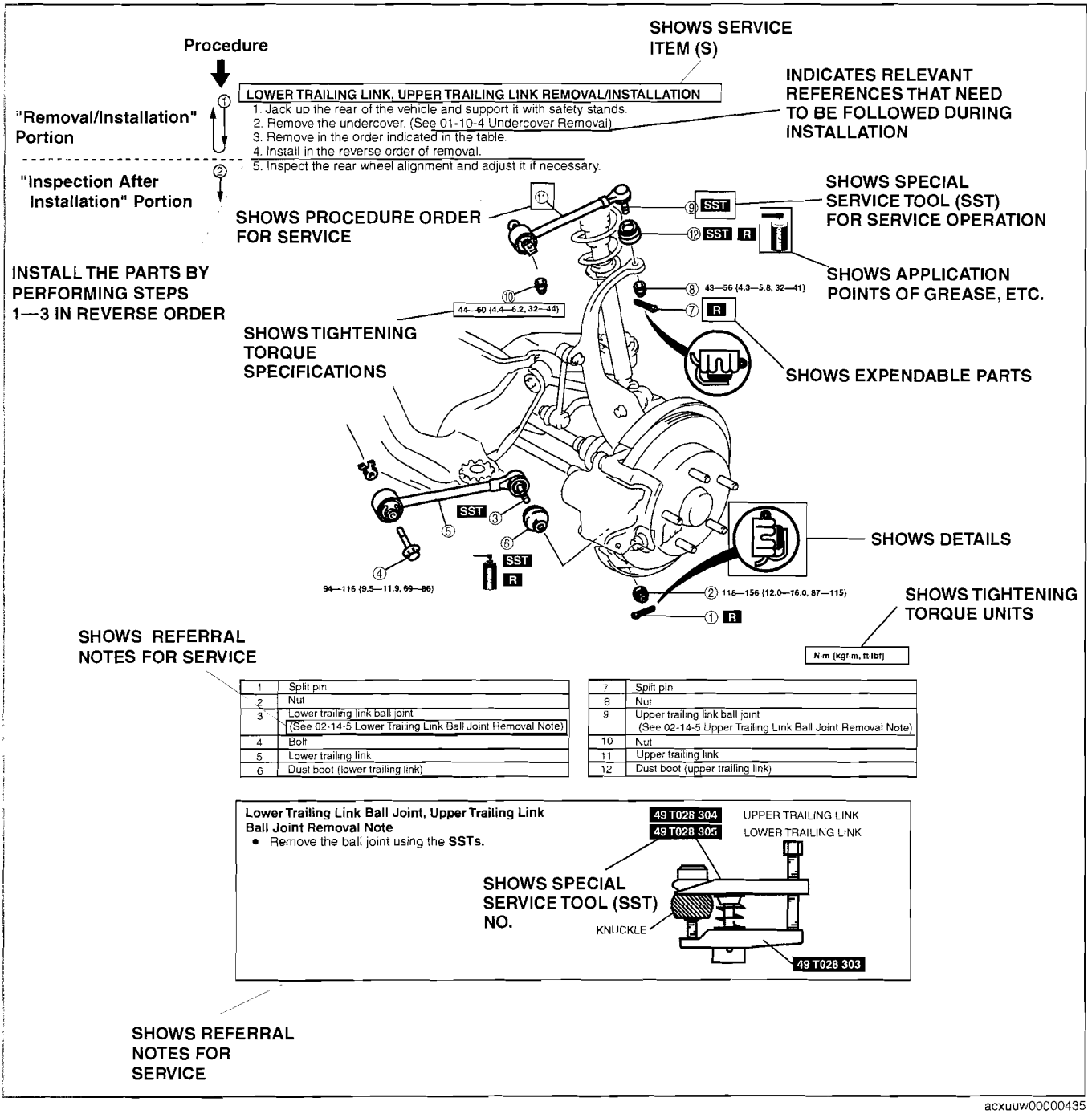
- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



acxuuw00000434

Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.



1	Split pin
2	Nut
3	Lower trailing link ball joint (See 02-14-5 Lower Trailing Link Ball Joint Removal Note)
4	Bolt
5	Lower trailing link
6	Dust boot (lower trailing link)

7	Split pin
8	Nut
9	Upper trailing link ball joint (See 02-14-5 Upper Trailing Link Ball Joint Removal Note)
10	Nut
11	Upper trailing link
12	Dust boot (upper trailing link)

acxuuw00000435

Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/ transmission fluid	New appropriate automatic transaxle/ transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

Advisory Messages

- You will find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

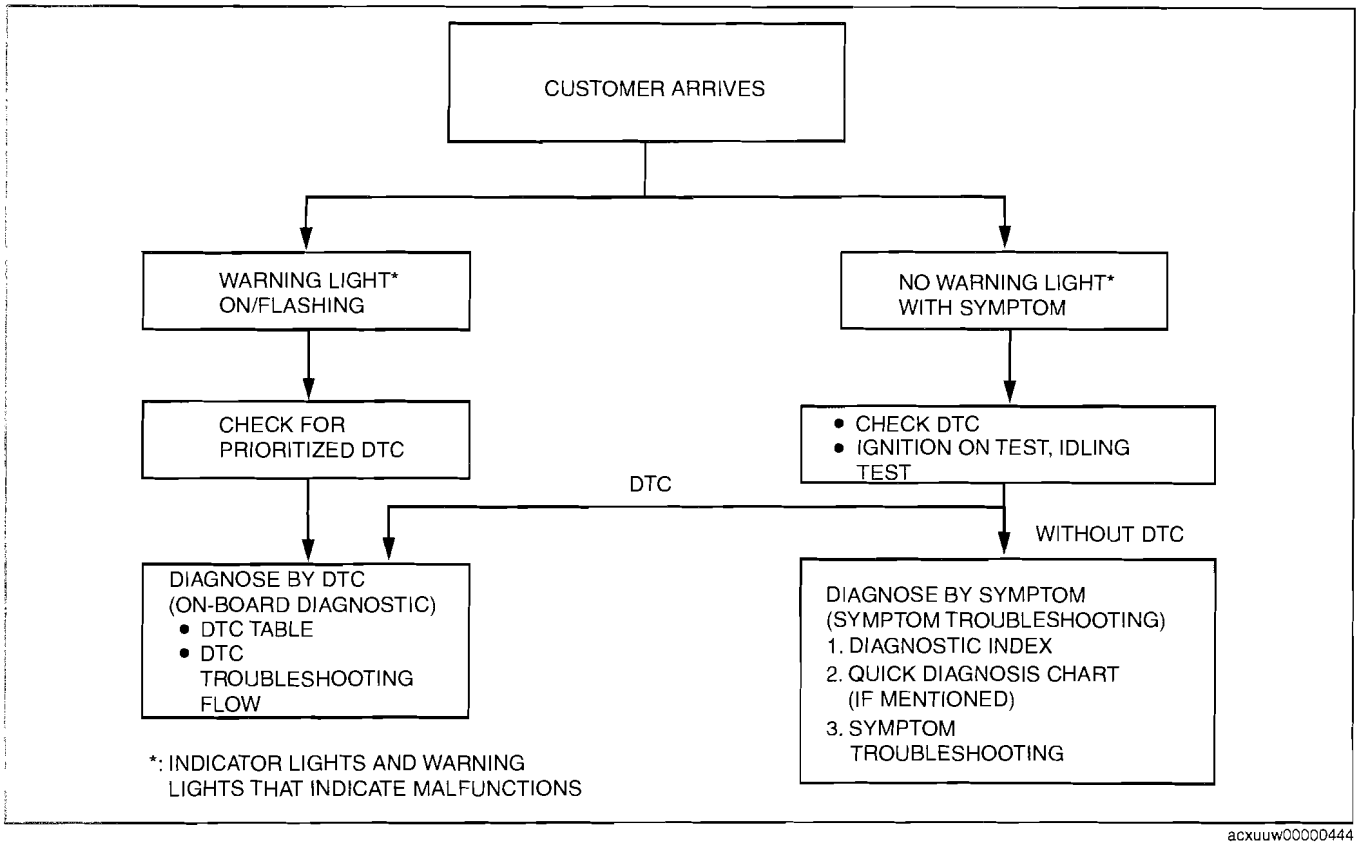
Specification

- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

Troubleshooting Procedure
Basic flow of troubleshooting



acxuuw00000444

DTC troubleshooting flow (on-board diagnostic)
- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

Diagnostic index
- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

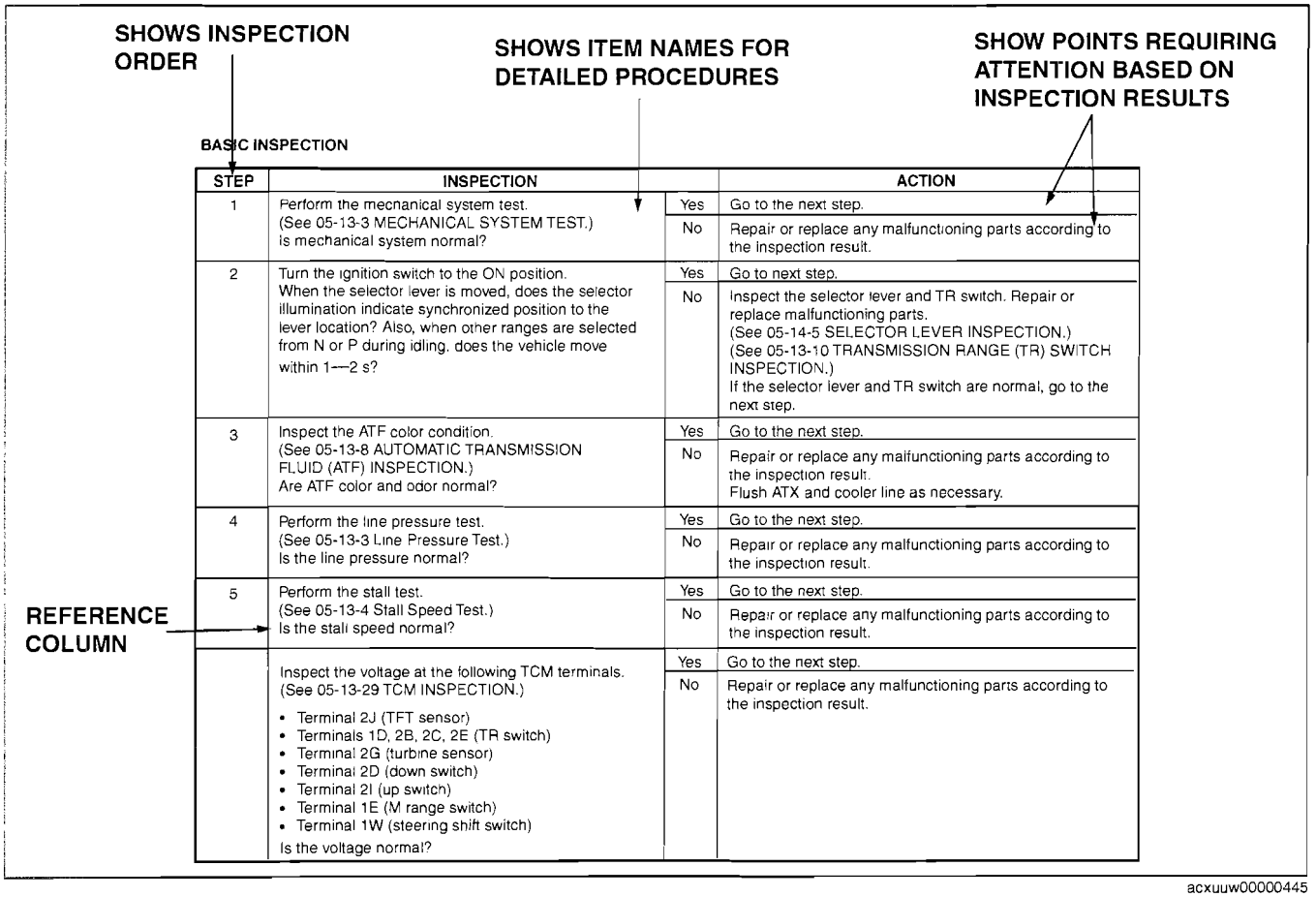
Quick diagnosis chart (If mentioned)
- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

Symptom troubleshooting
- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

Procedures for Use

Using the basic inspection (section 05)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the action column.



BASIC INSPECTION

STEP	INSPECTION		ACTION
1	Perform the mechanical system test. (See 05-13-3 MECHANICAL SYSTEM TEST.) Is mechanical system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
2	Turn the ignition switch to the ON position. When the selector lever is moved, does the selector illumination indicate synchronized position to the lever location? Also, when other ranges are selected from N or P during idling, does the vehicle move within 1—2 s?	Yes	Go to next step.
		No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-14-5 SELECTOR LEVER INSPECTION.) (See 05-13-10 TRANSMISSION RANGE (TR) SWITCH INSPECTION.) If the selector lever and TR switch are normal, go to the next step.
3	Inspect the ATF color condition. (See 05-13-8 AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION.) Are ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result. Flush ATX and cooler line as necessary.
4	Perform the line pressure test. (See 05-13-3 Line Pressure Test.) Is the line pressure normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
5	Perform the stall test. (See 05-13-4 Stall Speed Test.) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
	Inspect the voltage at the following TCM terminals. (See 05-13-29 TCM INSPECTION.) • Terminal 2J (TFT sensor) • Terminals 1D, 2B, 2C, 2E (TR switch) • Terminal 2G (turbine sensor) • Terminal 2D (down switch) • Terminal 2I (up switch) • Terminal 1E (M range switch) • Terminal 1W (steering shift switch) Is the voltage normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.

acxuuw00000445

Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

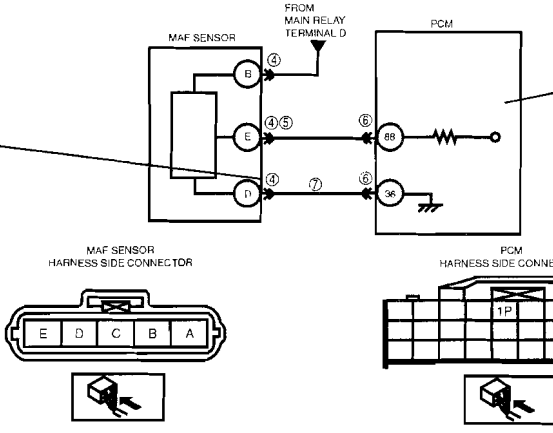
TROUBLE CONDITION

DETECTION CONDITION describes the condition under which the DTC is detected.

DTC P0103

DTC P0103	MAF circuit high input
DETECTION CONDITION	PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 68 is above 8.25 V, PCM determines that TP circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction during first drive cycle. Therefore, PENDING CODE is not available. • FREEZE FRAME DATE is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Open circuit in wiring between MAF sensor terminal D and PCM terminal 36 • Open circuit in MAF sensor ground circuit

POSSIBLE CAUSE describes possible point(s) of malfunction



Indicates the circuit to be inspected (01 and 05 section)

Indicates the inspection step No. to be performed (01 and 05 section)

Indicates the connector related to the inspection

STEP shows the order of troubleshooting

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Are related Service Bulletins and/or on-line repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect diagnostic tool to DLC-2. • Start engine. • Access MAF V PID using diagnostic tool. • Is MAF V PID within 0.2 - 8.3 V?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-33 INTERMITTENT CONCERN TROUBLESHOOTING)
		No	Go to next step.
4	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn ignition key to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion etc.). • Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.

ACTION describes the appropriate action to be taken according to the result (Yes/No) of the INSPECTION.

INSPECTION describes the method to quickly determine the malfunctioning part(s).

Reference item(s) to perform ACTION.

acxuuw00000446

Using the diagnostic index

- The symptoms of the malfunctions are listed in the diagnostic index for symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

No.	TROUBLESHOOTING ITEM		DESCRIPTION	Page
1	Melting of main or other fuses		—	(See 01-03-6 MELT NO.1 MAIN OR OTHER FUSE)
2	MIL comes on		MIL is illuminated incorrectly.	(See 01-03-7 NO.2 MIL COMES ON)
3	Will not crank		Starter does not work.	(See 01-03-8 NO. 3 WILL NOT CRANK)
4	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01-03-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK)
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	(See 01-03-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE)
6	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.	(See 01-03-15 NO.6 CRANKS NORMALLY BUT WILL NOT START)
7	Slow return to idle		Engine takes more time than normal to return to idle speed.	(See 01-03-19 NO. 7 SLOW RERUN TO IDLE)
8	Engine runs rough/rotling		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01-03-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE)
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	(See 01-03-23 NO. 9 FAST IDLE/RUNS ON)
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	(See 01-03-24 NO. 10 LOW IDLE/ STALLS DURING DECELERATION)

acxuuw00000447

Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. It also specifies the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

② PARTS WHICH MAY BE THE CAUSE OF PROBLEMS

SYMPTOM QUICK DIAGNOSTIC CHART

PART WHICH MAY BE THE SYMPTOM

① CHOOSE THE ACTUALSYMPTOM

Troubleshooting item \ Possible factor			Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture improperly	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts improperly installed	Cooling fan or condenser fan seat improperly	Accelerator cable free play mis-adjustment	Fuel quality
1	Melts of main or other fuse																						
2	MIL comes on																						
3	Will not crank		x	x		x	x			x			x										
4	Hard to start/long crank/erratic start/erratic crank																						x
5	Engine stalls	After start/at idle						x	x	x													x
6	Cranks normally but will not start							x	x	x													x
7	Slow return to idle																		x				
8	Engine runs rough/rolling idle							x	x														x
9	Fast idle/runs on																					x	
10	Low idle/stalls during deceleration																						
11	Engine stalls/quits	Acceleration/cruise						x	x														x
	Engine runs rough	Acceleration/cruise						x	x														x
	Misses	Acceleration/cruise						x	x														x
	Buck/jerk	Acceleration/cruise/ deceleration						x	x														x
	Hesitation/stumble	Acceleration						x	x														x
	Surges	Acceleration/cruise						x	x														x
12	Lack/loss of power	Acceleration/cruise						x	x														x
13	Knocking/pinging	Acceleration/cruise						x										x					
14	Poor fuel economy							x	x							x		x	x				x
15	Emissions compliance							x	x				x					x					
16	High oil consumption/leakage										x	x	x										
17	Cooling system concerns	Overheating													x	x	x	x	x				
18	Cooling system concerns	Runs cold																x	x				
19	Exhaust smoke												x					x					
20	Fuel odor (in engine compartment)																						
21	Engine noise			x									x		x								
22	Vibration concerns (engine)														x					x	x		
23	A/C does not work sufficiently																						
24	A/C always on/ A/C compressor runs continuously																						
25	A/C does not cut off under wide open throttle conditions																						
26	Exhaust sulphur smell																						x
27	Fuel refill concerns																						
28	Fuel filling shut off issues																						
29	Intermittent concerns					x																	
30	Constant voltage																						
31	Spark plug condition							x			x		x				x						x
32	Automatic transaxle concerns	Upshift/downshift/ engagement	(See 05-01 AUTOMATIC TRANSAXLE SYMPTOM TROUBLESOOTING)																				

acxuuw00000448

Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to take for each trouble symptom.

DESCRIPTION describes what kind of TROUBLE SYMPTOM

TROUBLE SYMPTOM

14	Engine flares up or slips when upshifting or down shifting
DESCRIPTION	• When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly. • When accelerator is depressed while driving, engine speed increases but vehicle not.
POSSIBLE CAUSE	• There is clutch slip because clutch is stuck or line pressure is low. — Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) • Line pressure low • Malfunction or mis-adjustment of TP sensor • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor grouno • Malfunction of shift solenoid A, B or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Malfunction of throttle cable • Malfunction of throttle valve body — Poor operating of mechanical pressure • Selector lever position disparity • TR switch position disparity Note • Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

POSSIBLE CAUSE describes possible point of malfunction

STEP shows the order of troubleshooting.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is line pressure okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	• Is shift point okay? (See 05-17-5 ROAD TEST)	Yes	Go to next step
		No	Go to symptom troubleshooting No.9 "Abnormal shift".
3	• Stop engine and turn ignition switch on. • Connect diagnostic tool to DLC-2. • Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. • Is operating sound of shift solenoids heard?	Yes	• Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F)) • If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATiON)
		No	• Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation) • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.
4	• Verify test results. — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. — If vehicle is repaired, troubleshooting completed. — If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM.		

Reference item(s) for additional information to perform INSPECTION.

INSPECTION describes the method to quickly determine the malfunctioning part(s).

ACTION describes the appropriate action to be taken according to the result (Yes/No) of the INSPECTION.

How to perform ACTION is described in the relative material shown.

Reference item(s) to perform ACTION.

acxuuw00000449

UNITS

id000000801600

Electric current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm^2 (kilogram force per square centimeter)
	psi (pounds per square inch)
Number of revolutions	rpm (revolutions per minute)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm^2 in the following specifications:

  210—260 kPa {2.1—2.7 kgf/cm^2, 30—38 psi}
  270—310 kPa {2.7—3.2 kgf/cm^2, 39—45 psi}

- The actual converted values for 2.7 kgf/cm^2 are 264 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

SERVICE CAUTIONS

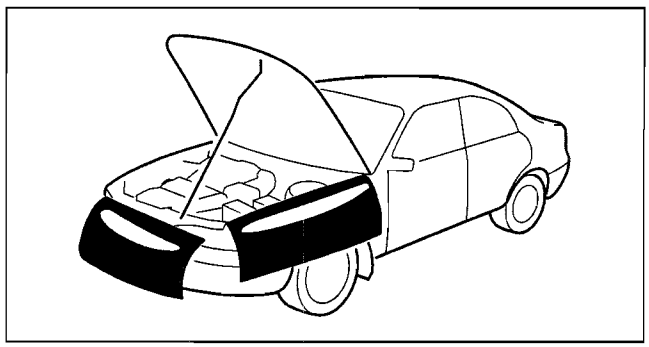
id000000800200

Injury/damage Prevention Precautions

- Depending on the vehicle, the cooling fan may operate suddenly even when the ignition switch is turned off. Therefore, keep hands and tools away from the cooling fan even if the cooling fan is not operating to prevent injury to personnel or damage to the cooling fan. Always disconnect the negative battery cable when servicing the cooling fan or parts near the cooling fan.

Protection of the Vehicle

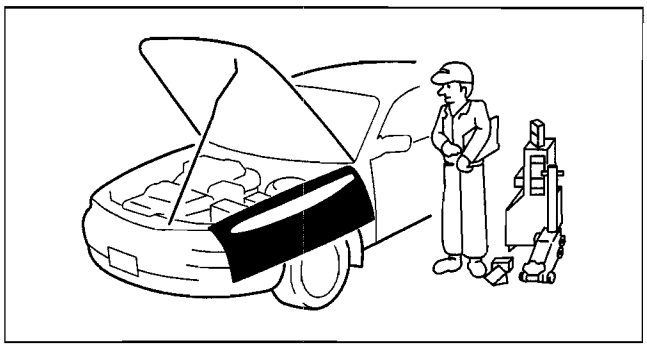
- Always be sure to cover fenders, seats and floor areas before starting work.



am3uuw0000010

Preparation of Tools and Measuring Equipment

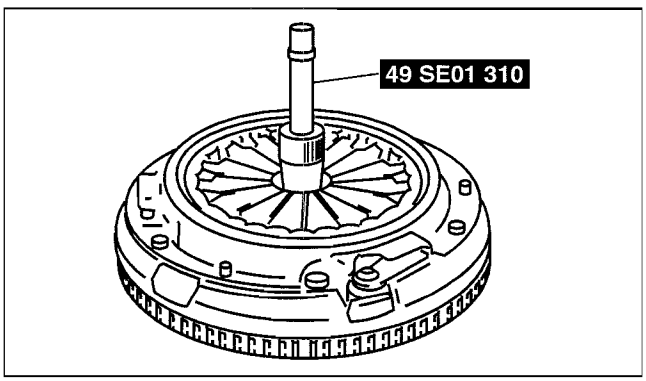
- Be sure that all necessary tools and measuring equipment are available before starting any work.



am3uuw0000010

Special Service Tools

- Use special service tools or equivalent when they are required.



am3uuw0000010

Malfunction Diagnosis System

- Use the Mazda modular diagnostic system (M-MDS) or equivalent for malfunction diagnosis.

Disconnection of the Negative Battery Cable

- When working with the negative battery cable disconnected, wait for 1 min or more to allow the back up power supply of the SAS control module to deplete its stored power after the cable is disconnected.
- Disconnecting the battery cable will delete the memories of the clock, audio, and DTCs, etc. Therefore, it is necessary to note down the information stored in those memories before disconnecting the cable.
- When the ignition switch is turned to the ON position with the negative battery cable connected, the car navigation unit starts program reading. To prevent a car navigation unit malfunction, do not start the engine while "Program reading. Do not turn the power off" is displayed on the screen (**approx. 10 sec.**).

Oil Leakage Inspection

- Use either of the following procedures to identify the type of oil that is leaking:

Using UV light (black light)

1. Remove any oil on the engine or transaxle/transmission.

Note

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle/transmission oil).

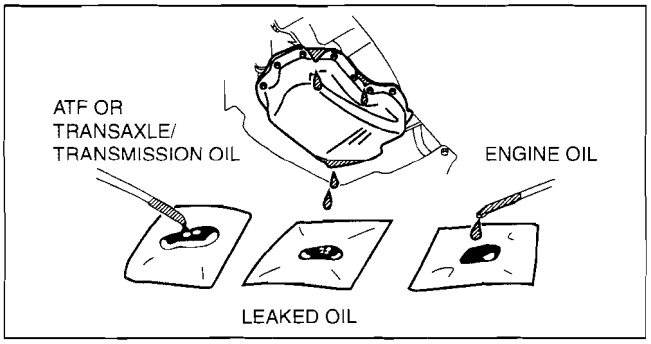
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle/transmission oil).
3. Allow the engine to run for 30 min.
4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.
5. If no dye leakage is found, allow the engine to run for another 30 min. or drive the vehicle then reinspect.
6. Find where the oil is leaking from, then make necessary repairs.

Note

- To determine whether it is necessary to replace the oil after adding the fluorescent dye, refer to the fluorescent dye instruction manual.

Not using UV light (black light)

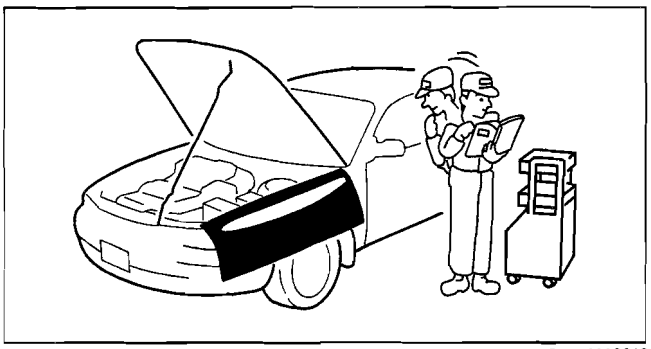
1. Gather some of the leaking oil using an absorbent white tissue.
2. Take samples of engine oil and ATF (or transaxle/transmission oil), both from the dipstick, and place them next to the leaked oil already gathered on the tissue.
3. Compare the appearance and smell, and identify the type of oil that is leaking.
4. Remove any oil on the engine or transaxle/transmission.
5. Allow the engine to run for 30 min.
6. Check the area where the oil is leaking, then make necessary repairs.



am3uuw0000010

Removal of Parts

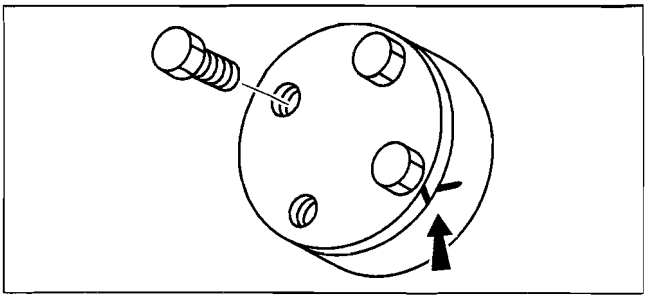
- While correcting a problem, also try to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.



am3uuw0000010

Disassembly

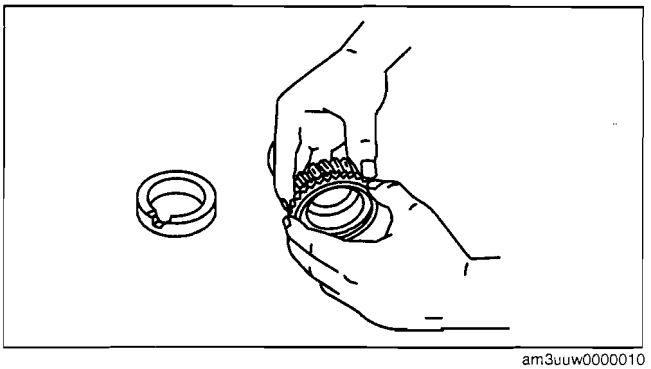
- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



am3uuw0000010

Inspection During Removal, Disassembly

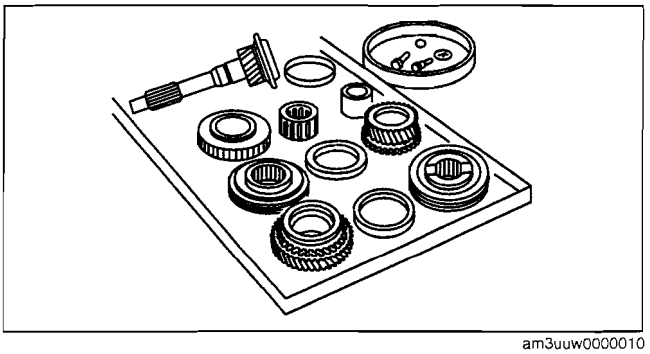
- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



am3uuw0000010

Arrangement of Parts

- All disassembled parts should be carefully arranged for reassembly.
- Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



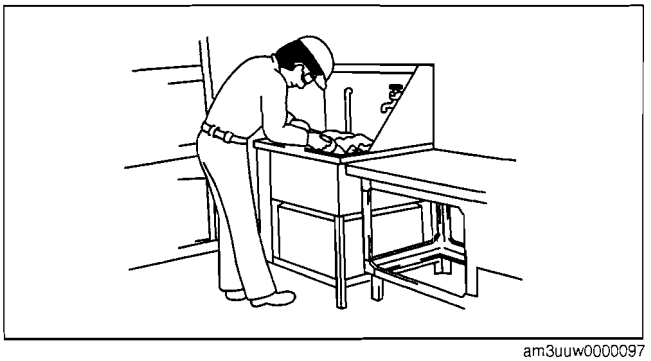
am3uuw0000010

Cleaning of Parts

- All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

  Warning

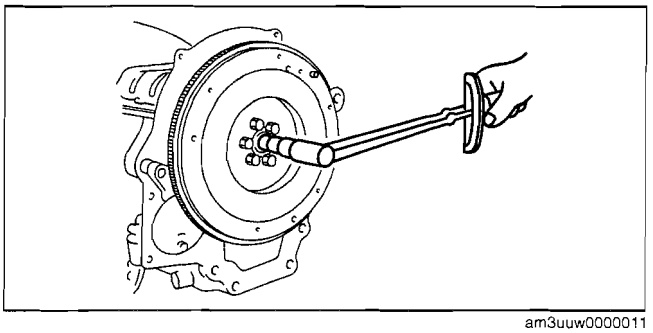
  - **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



am3uuw0000097

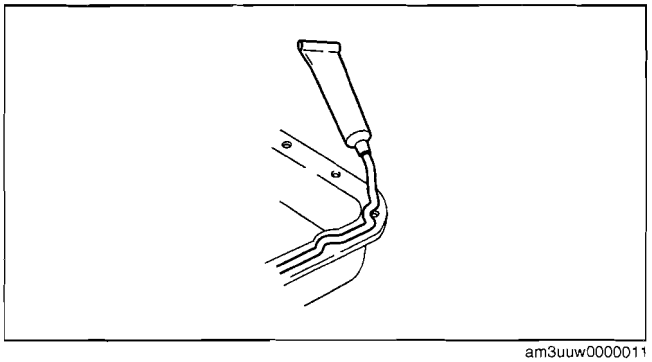
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, the following parts should be replaced with new ones:
  - Oil seals
  - Gaskets
  - O-rings
  - Lock washers
  - Cotter pins
  - Nylon nuts



am3uuw0000011

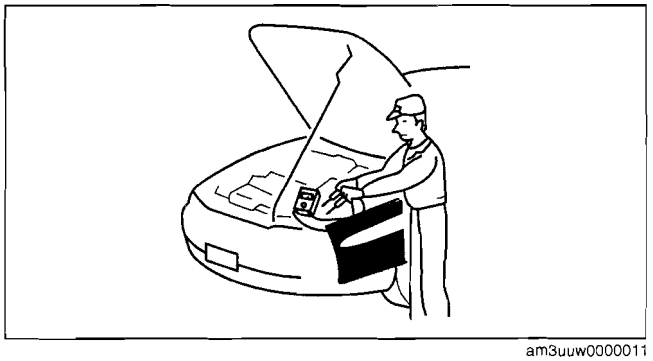
- Depending on location:
  - Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
  - Oil should be applied to the moving components of parts.
  - Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



am3uuw0000011

Adjustment

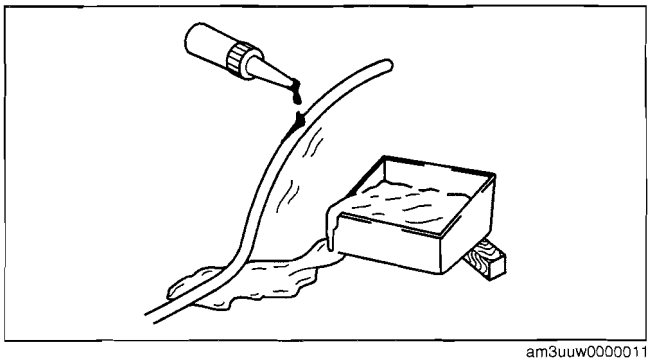
- Use suitable gauges and testers when making adjustments.



am3uuw0000011

Rubber Parts and Tubing

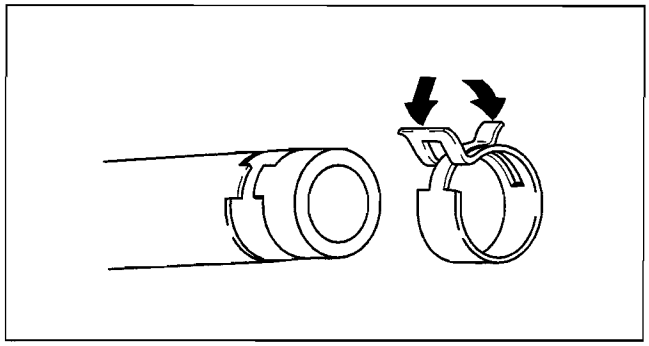
- Prevent gasoline or oil from getting on rubber parts or tubing.



am3uuw0000011

Hose Clamps

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.

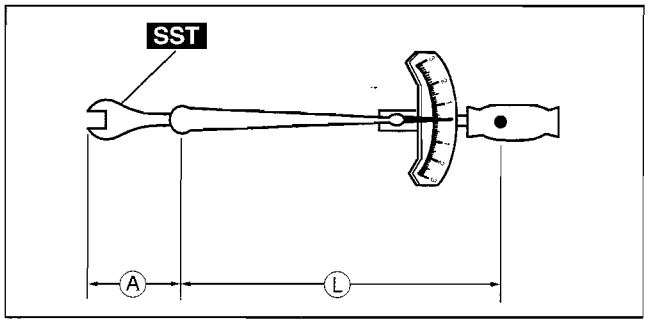


am3uuw0000011

Torque Formulas

- When using a torque wrench-**SST** or equivalent combination, the written torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]

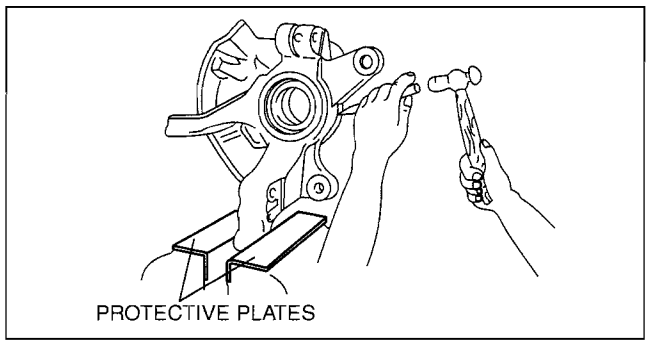


am3uuw0000011

A : The length of the **SST** past the torque wrench drive.
L : The length of the torque wrench.

Vise

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



am3uuw0000011

Dynamometer

- When inspecting and servicing the power train on the dynamometer or speed meter tester, pay attention to the following:
  - Place a fan, preferably a vehicle-speed proportional type, in front of the vehicle.
  - Make sure the vehicle is in a facility with an exhaust gas ventilation system.
  - Since the rear bumper might deform from the heat, cool the rear with a fan. (Surface of the bumper must be below **70°C {158°F} degrees**.)
  - Keep the area around the vehicle uncluttered so that heat does not build up.
  - Watch the water temperature gauge and don't overheat the engine.
  - Avoid added load to the engine and maintain normal driving conditions as much as possible.

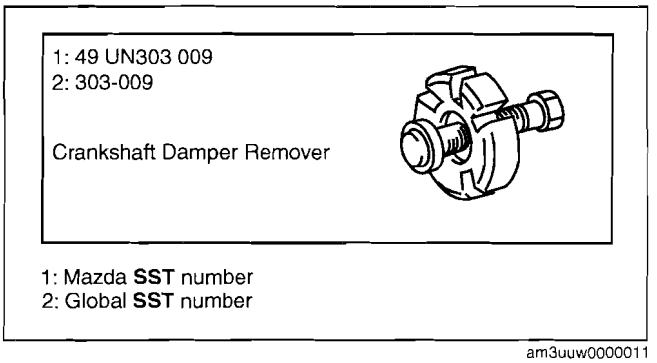
Note

- When only the front or rear wheels are rotated on a chassis dynamometer or equivalent, the ABS CM determines that there is a malfunction in the ABS and illuminates the following lights:
  - Vehicles with ABS
    - ABS warning light
    - Brake system warning light
  - Vehicles with DSC
    - ABS warning light
    - Brake system warning light
    - DSC indicator light
- If the above lights are illuminated, dismount the vehicle from the chassis dynamometer and turn the ignition switch to the LOCK position. Then, turn the ignition switch back to the ON position, run the vehicle at 10 km/h or more and verify that the warning lights go out. In this case, a DTC will be stored in the memory. Clear the DTC from the memory by following the memory clearing procedure [ABS]/[DSC] in the on-board diagnostic system. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)(See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

SST

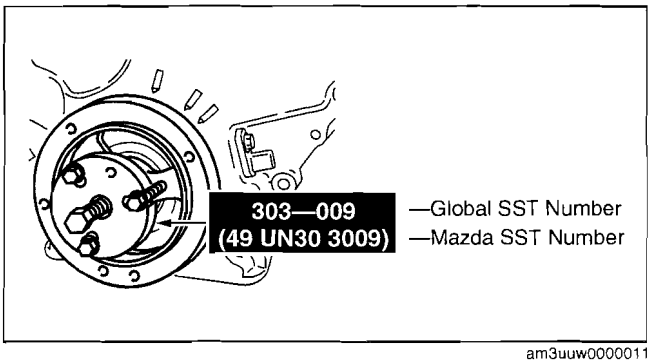
- Some global **SST** or equivalent are used as **SSTs** necessary for engine repair. Note that these **SSTs** are marked with global **SST** numbers.
- Note that a global **SST** number is written together with a corresponding Mazda **SST** number as shown below.

Example (section **-60)



am3uuw0000011

Example (except section **-60)



am3uuw0000011

INSTALLATION OF RADIO SYSTEM

id000000800300

- If a radio system is installed improperly or if a high-powered type is used, the CIS and other systems may be affected. When the vehicle is to be equipped with a radio, observe the following precautions:
  - — Install the antenna at the farthest point from control modules.
  - — Install the antenna feeder as far as possible from the control module harnesses.
  - — Ensure that the antenna and feeder are properly adjusted.
  - — Do not install a high-powered radio system.

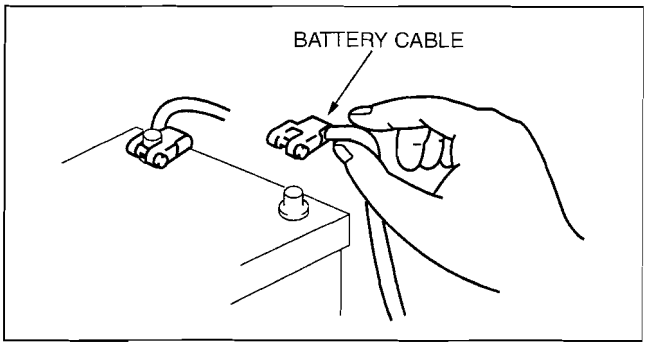
ELECTRICAL SYSTEM

id000000800400

Electrical Parts

Battery cable

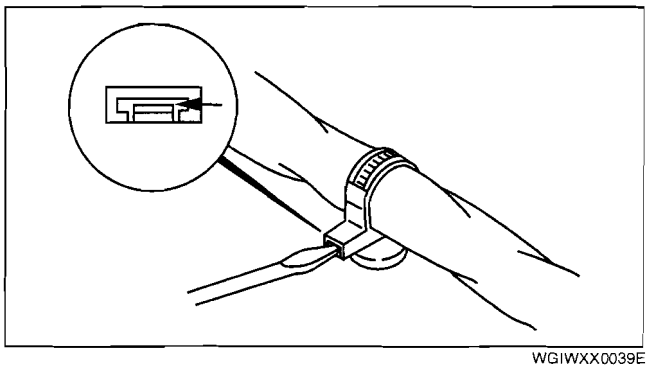
- Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.



am3uuw00001087

Wiring Harness

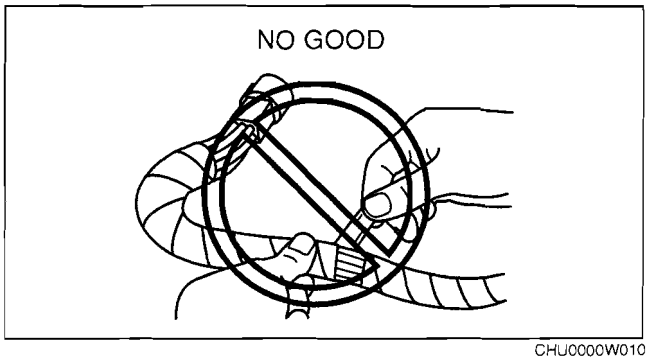
- To remove the wiring harness from the clip in the engine room, pry up the hook of the clip using a flathead screwdriver.



WGIWXX0039E

Caution

- **Do not remove the harness protective tape. Otherwise, the wires could rub against the body, which could result in water penetration and electrical shorting.**

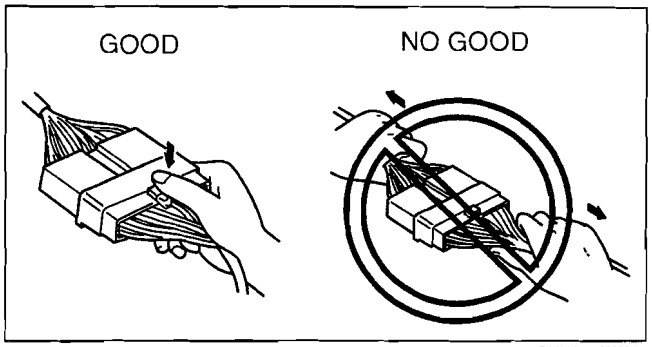


CHU0000W010

Connectors

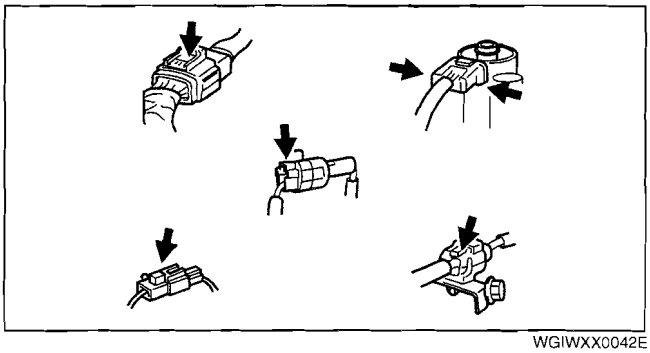
Disconnecting connectors

- When disconnecting connector, grasp the connectors, not the wires.



CHU0000W014

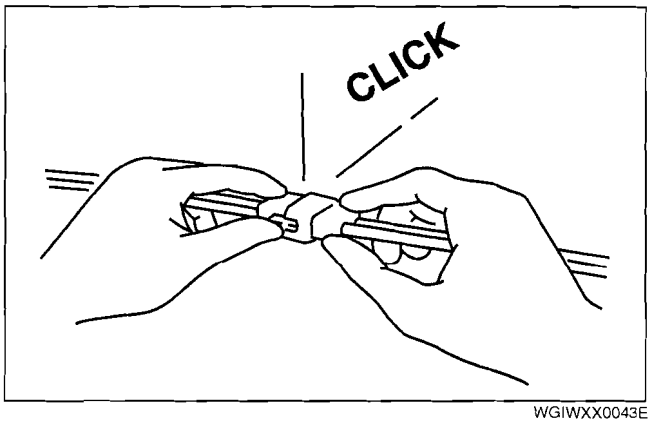
- Connectors can be disconnected by pressing or pulling the lock lever as shown.



WGIWXX0042E

Locking connector

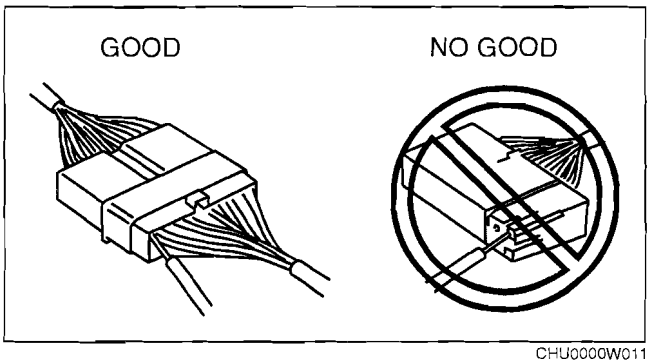
- When locking connectors, listen for a click indicating they are securely locked.



WGIWXX0043E

Inspection

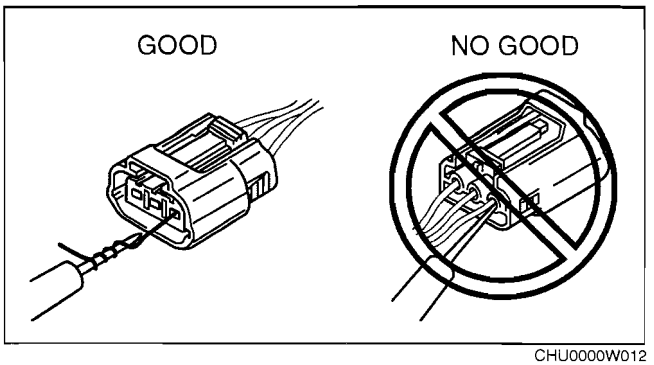
- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.



CHU0000W011

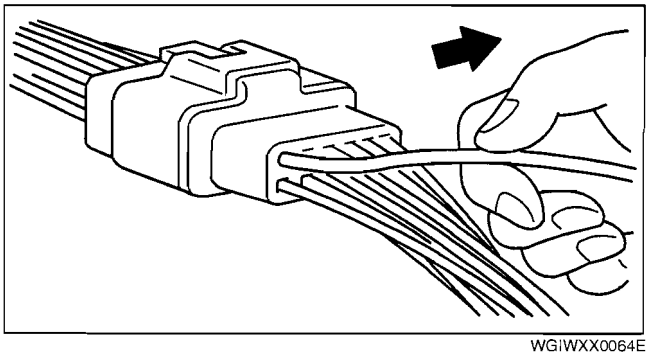
- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.

Caution
- **To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.**

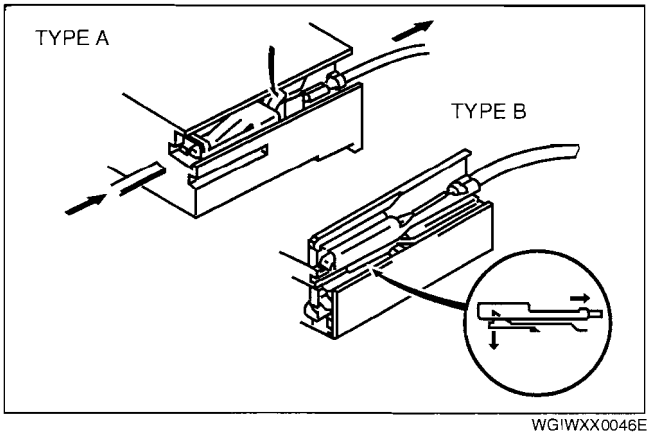


CHU0000W012

Terminals
Inspection
- Pull lightly on individual wires to verify that they are secured in the terminal.

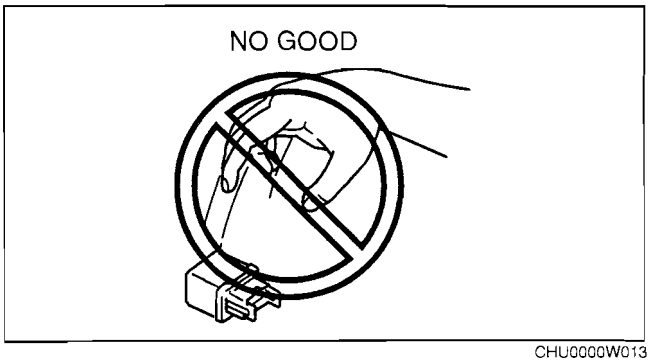

WGIWXX0064E

Replacement
- Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.
- Insert a thin piece of metal from the terminal side of the connector and with the terminal locking tab pressed down, pull the terminal out from the connector.



WGIWXX0046E

Sensors, Switches, and Relays
- Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.



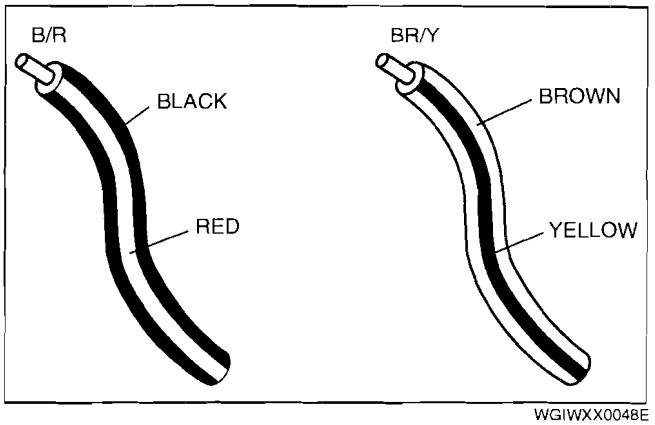
CHU0000W013

Wiring Harness

Wiring color codes

- Two-color wires are indicated by a two-color code symbol.
- The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green	–	–

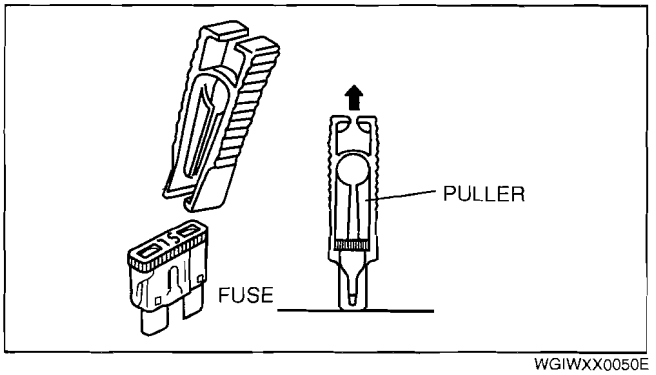


WGIWXX0048E

Fuse

Replacement

- When replacing a fuse, be sure to replace it with one of the same capacity. If a fuse fails again, the circuit probably has a short and the wiring should be inspected.
- Be sure the negative battery terminal is disconnected before replacing a main fuse.
- When replacing a pullout fuse, use the fuse puller.



WGIWXX0050E

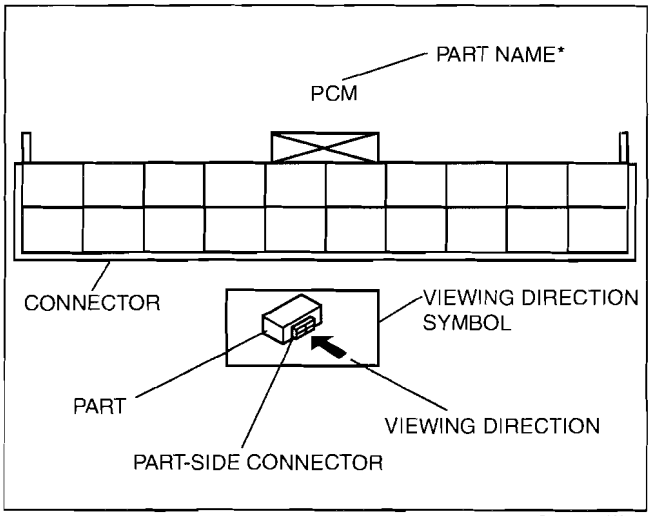
Direction of View for Connector

- The viewing direction of connectors is indicated with a symbol.
- The figures showing the viewing direction are the same as those used in Wiring Diagrams.
- The viewing directions are shown in the following three ways:

Part-side connector

The viewing direction of part-side connectors is from the terminal side.

* : Part names are shown only when there are multiple connector drawings.

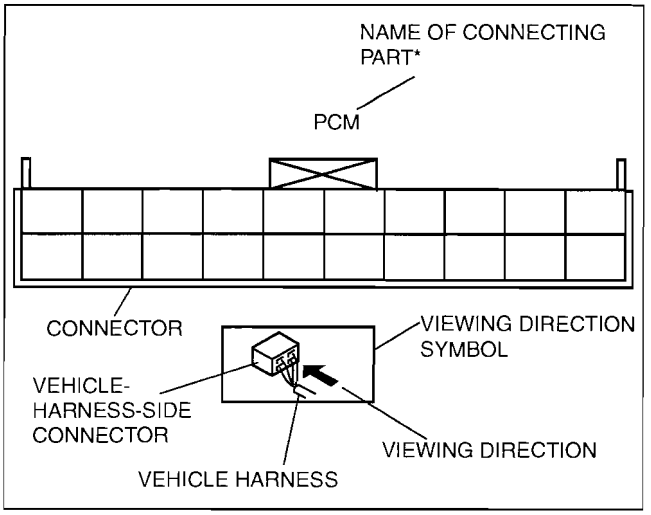


CHU0000W001

Vehicle harness-side connector

The viewing direction of vehicle harness-side connectors is from the harness side.

* : Part names are shown only when there are multiple connector drawings.

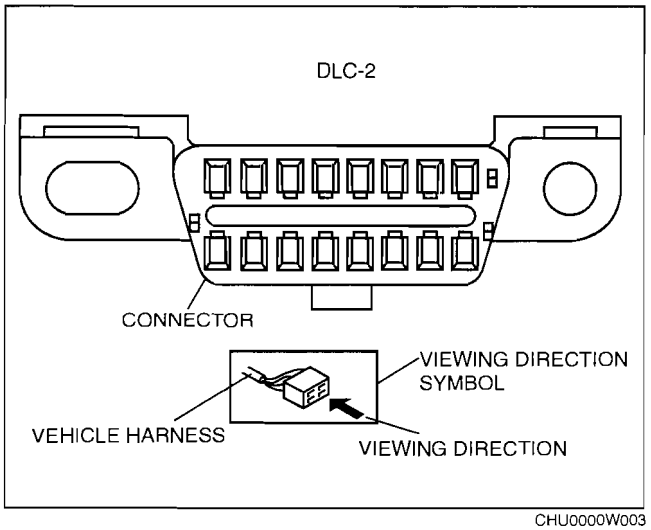


CHU0000W002

Other

When it is necessary to show the terminal side of vehicle harness-side connectors, such as the following connectors, the viewing direction is from the terminal side.

- Main fuse block and the main fuse block relays
- Data link connector
- Check connector
- Relay box



CHU0000W003

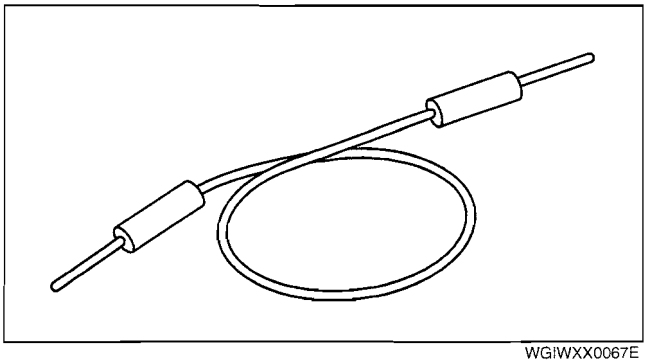
Electrical Troubleshooting Tools

Jumper wire

Caution

- **Do not connect a jumper wire from the power source line to a body ground. This may cause burning or other damage to wiring harnesses or electronic components.**

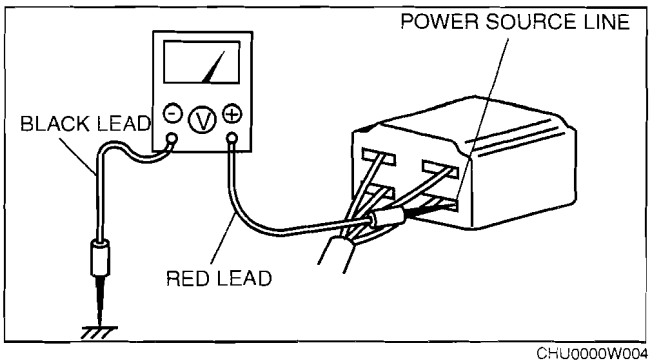
- A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.



WGIWXX0067E

Voltmeter

- The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of **15 V or more** is used by connecting the positive (+) probe (red lead wire) to the point where voltage will be measured and the negative (-) probe (black lead wire) to a body ground.



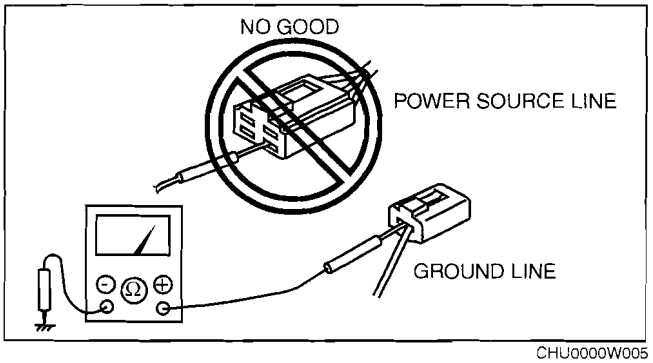
CHU0000W004

Ohmmeter

Caution

- **Do not connect the ohmmeter to any circuit where voltage is applied. This will damage the ohmmeter.**

- The ohmmeter is used to measure the resistance between two points in a circuit and to inspect for continuity and short circuits.

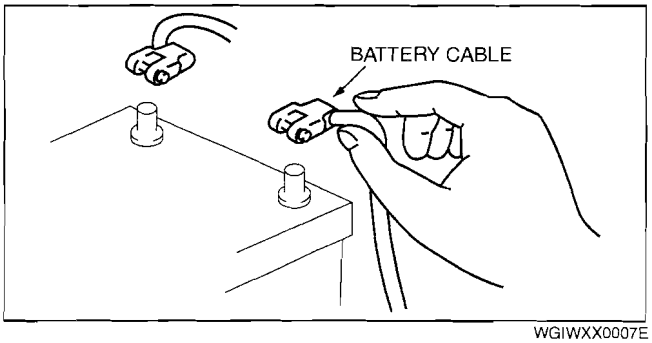


CHU0000W005

Precautions Before Welding

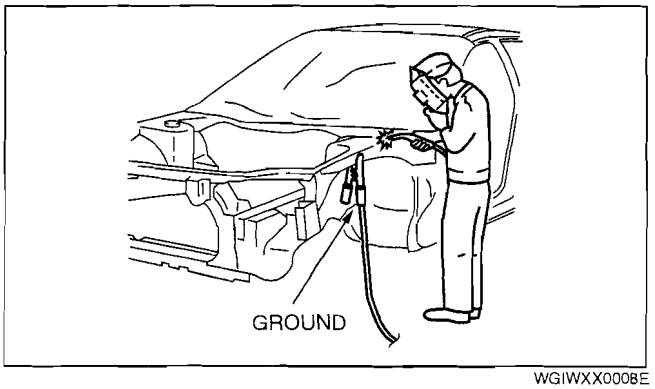
A vehicle has various electrical parts. To protect the parts from excessive current generated when welding, be sure to perform the following procedure.

1. Turn the ignition switch to the LOCK position.
2. Disconnect the battery cables.



WGIWXX0007E

3. Securely connect the welding machine ground near the welding area.
4. Cover the peripheral parts of the welding area to protect them from weld spatter.



WGIWXX0008E

JACKING POSITIONS, VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITIONS

id000000800500

Jacking Positions

Warning

- **Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking points and block the wheels.**

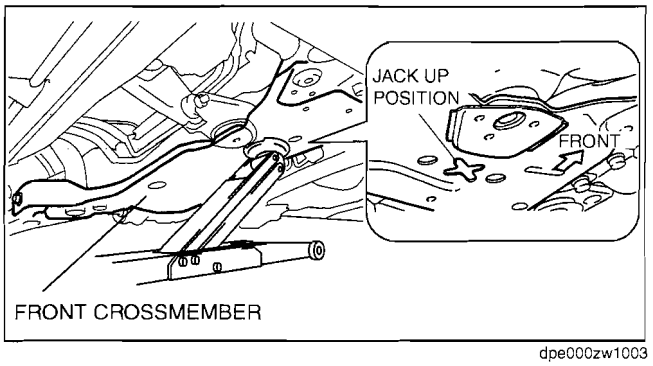
- Use safety stands to support the vehicle after it has been lifted.

Front

Note

- To prevent obstruction between the jack body and front bumper when the jack body is inserted, use a low-floor type jack.

- Near the center of the front crossmember.



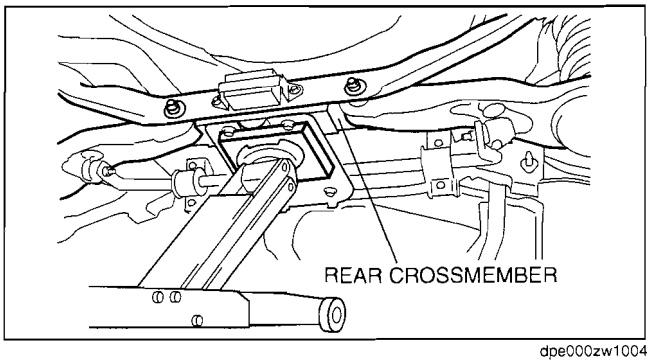
dpe000zw1003

Rear

Caution

- **Place a board (approx. 20 mm {0.78 in} thick) between the rear crossmember and the jack to prevent damage to the crossmember.**

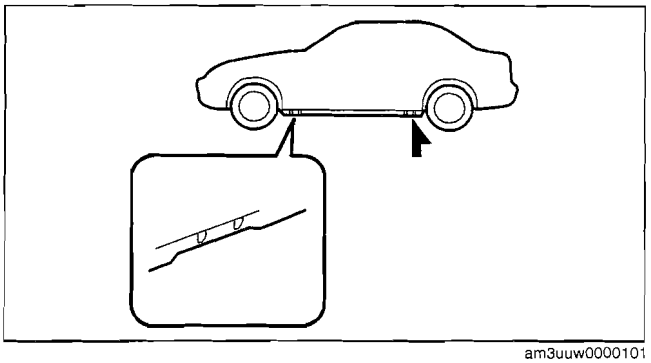
- At the center of the rear crossmember.



dpe000zw1004

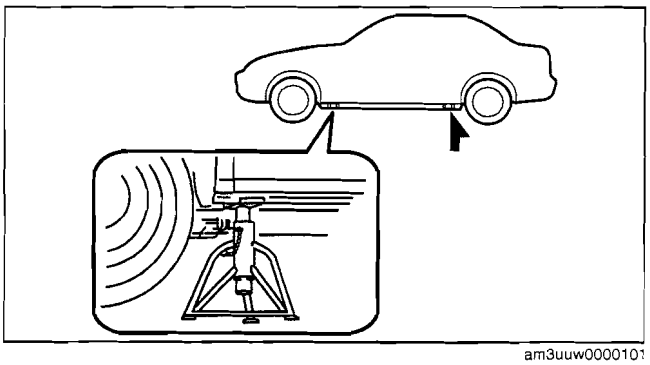
Vehicle Lift Positions
Front and rear

Warning
- **Unstably lifting a vehicle is dangerous. The vehicle can slip off the lift and cause serious injury and/or vehicle damage. Make sure that the vehicle is on the lift horizontally by adjusting the height of support at the end of the arm of the lift.**



am3uuw0000101

Safety Stand Positions
Front and rear
- Both sides of the vehicle, on side sills.



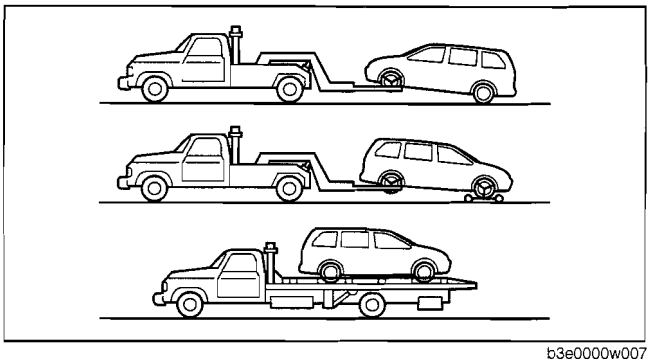
am3uuw0000101

TOWING

id000000800600

Towing

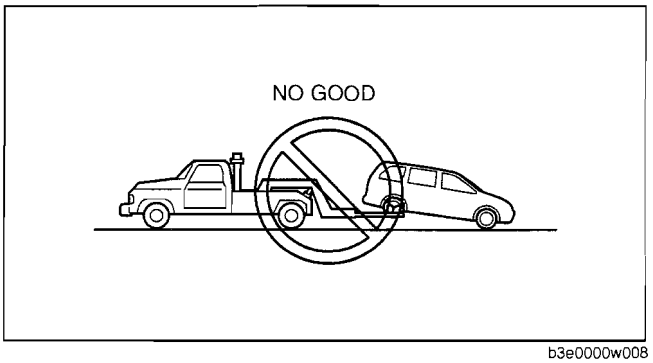
- Proper lifting and towing are necessary to prevent damage to the vehicle. State and local laws must be followed.
- A towed vehicle usually should have its front wheels off the ground. If excessive damage or other conditions prevent this, use wheel dollies.
- When towing with the rear wheels on the ground, release the parking brake.



b3e0000w007

Caution

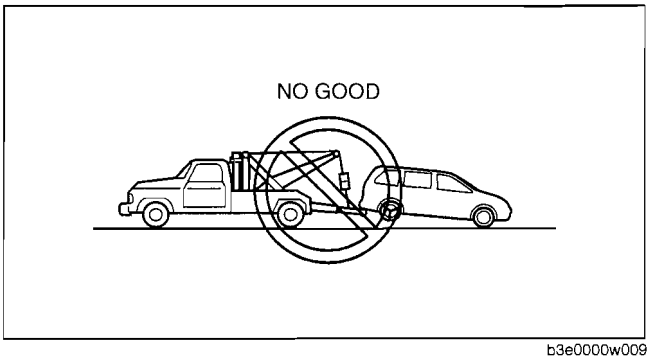
- **Do not tow the vehicle pointed backward with driving wheel on the ground. This may cause internal damage to the transaxle.**



b3e0000w008

Caution

- **Do not tow with sling-type equipment. This could damage your vehicle. Use wheel-lift or flatbed equipment.**



b3e0000w009

Tiedown Hooks

Caution

- **Don't use the tiding hook under the rear for tiedown. It is designed ONLY for tying down the vehicle when it's being transported. Using it for tiedown will damage the bumper.**

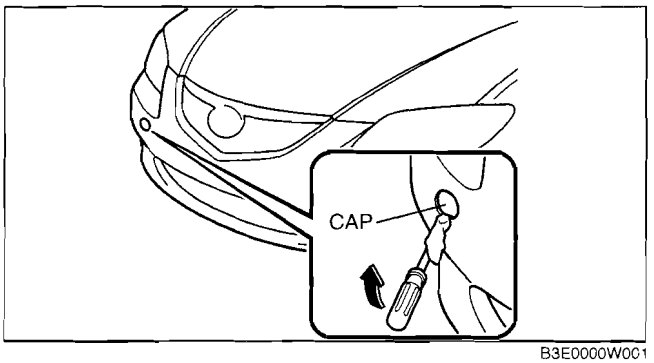
Note

- When tiedown with chain or cable, wrap the chain or cable with a soft cloth near the bumper to prevent damage to the bumper.

1. Remove the tiedown eyelet from trunk.
2. Wrap a screwdriver or similar tool with a soft cloth to prevent damage to the painted bumper and open the cap located on the front bumper.

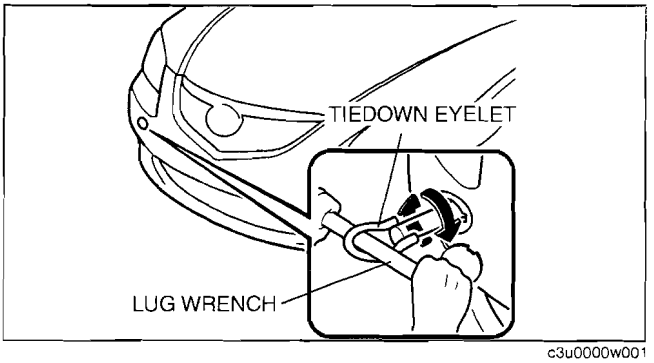
Caution

- **The cap cannot be completely removed. Do not use excessive force as it may damage the cap or scratch the painted bumper surface.**



B3E0000W001

3. Securely install the tiedown eyelet using the wheel brace.

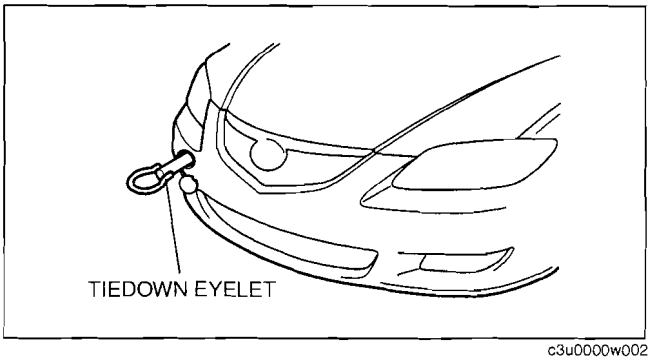


c3u0000w001

4. Hook the tying rope to the tiedown eyelet.

Caution

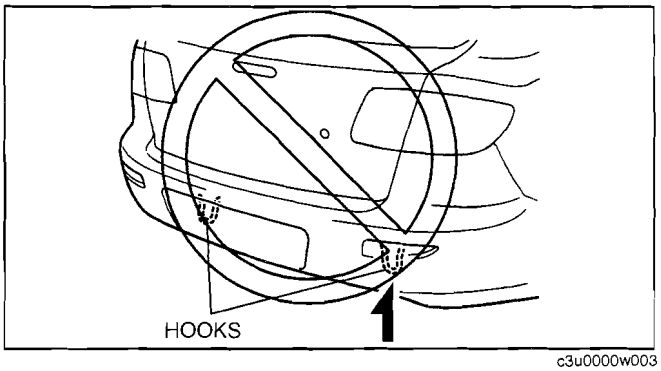
- **If the tiedown eyelet is not securely tightened, it may loosen or disengage from the bumper when tying down the vehicle. Make sure that the tiedown eyelet is securely tightened to the bumper.**



c3u0000w002

Caution

- **Do not use the hooks under the rear bumper for towing and tying down, as they cannot hold the load and it will damage the bumper.**



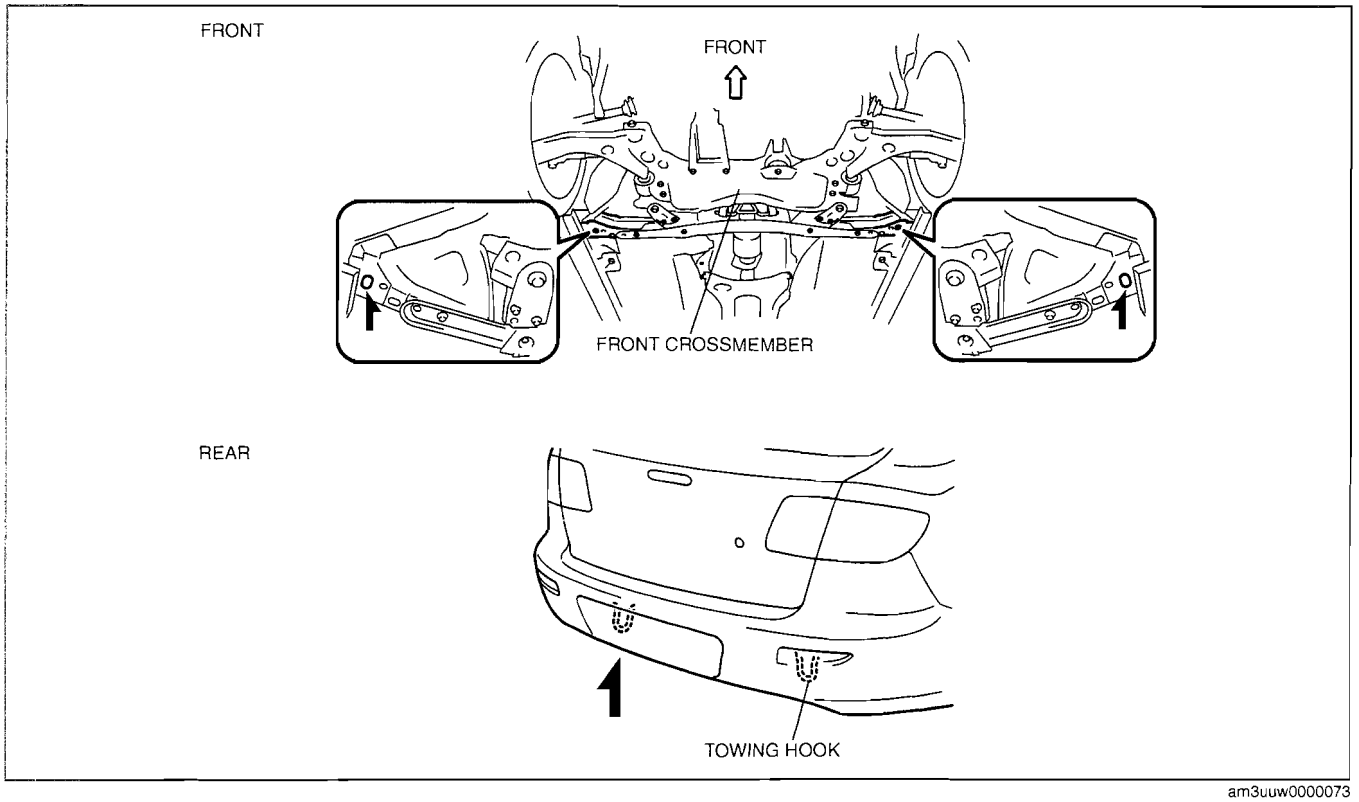
c3u0000w003

TIEDOWN HOOK

id000000800700

Caution

- **Do not use the tie down hook for towing the vehicle. Use it only for securing the vehicle.**

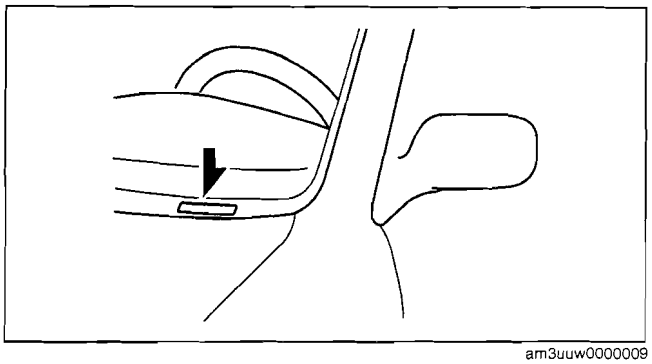


am3uuw0000073

IDENTIFICATION NUMBER LOCATIONS

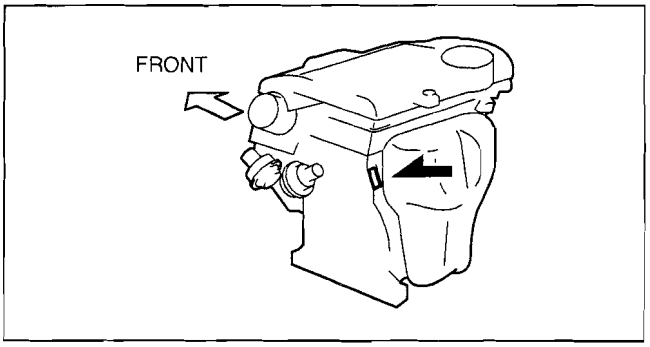
id000000800800

Vehicle Identification Number (VIN)



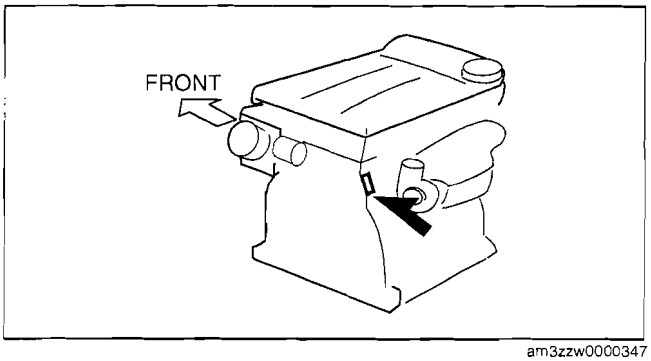
am3uuw0000009

Engine Identification Number
LF, L3



am3uuw0000010

L3 WITH TC



am3zzw0000347

SAE STANDARDS

id000000800900

- In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

SAE Standard		Remark		SAE Standard		Remark
Abbreviation	Name			Abbreviation	Name	
AP	Accelerator Pedal			MAP	Manifold Absolute Pressure	
APP	Accelerator Pedal Position			MAF sensor	Mass Air Flow Sensor	
ACL	Air Cleaner			MFL	Multiport Fuel Injection	
A/C	Air Conditioning			OBD	On-board Diagnostic System	
BARO	Barometric Pressure			OL	Open Loop	
B+	Battery Positive Voltage			OC	Oxidation Catalytic Converter	
CMP sensor	Camshaft Position Sensor			O2S	Oxygen sensor	
CAC	Charge Air Cooler			PNP	Park/Neutral Position	
CLS	Closed Loop System			PSP	Power Steering Pressure	
CTP	Closed Throttle Position			PCM	Powertrain Control Module	#3
CPP	Clutch Pedal Position			PAIR	Pulsed Secondary Air Injection	Pulsed injection
CIS	Continuous Fuel Injection System			AIR	Secondary Air Injection	Injection with air pump
CKP sensor	Crankshaft Position Sensor			SAPV	Secondary Air Pulse Valve	
DLC	Data Link Connector			SFI	Sequential Multiport Fuel Injection	
DTM	Diagnostic Test Mode	#1		3GR	Third Gear	
DTC	Diagnostic Test Code(s)			TWC	Three Way Catalytic Converter	
DI	Distributor Ignition			TB	Throttle Body	
DLI	Distributorless Ignition			TP sensor	Throttle Position Sensor	
EI	Electronic Ignition	#2		TCC	Torque Converter Clutch	
ECT	Engine Coolant Temperature			TCM	Transmission (Transaxle) Control Module	
EM	Engine Modification			TR	Transmission (Transaxle) Range	
EVAP	Evaporative Emission			TC	Turbocharger	
EGR	Exhaust Gas Recirculation			VSS	Vehicle Speed Sensor	
FC	Fan Control			VR	Voltage Regulator	
FF	Flexible Fuel			VAF sensor	Volume Air Flow Sensor	
4GR	Fourth Gear			WU-TWC	Warm Up Three Way Catalytic Converter	#4
GEN	Generator			WOP	Wide Open Throttle	
GND	Ground					
HO2S	Heated Oxygen Sensor	With heater				
IAC	Idle Air Control					
IAT	Intake Air Temperature					
KS	Knock Sensor					
MIL	Malfunction Indicator Lamp					

#1: Diagnostic trouble codes depend on the diagnostic test mode.
#2: Controlled by the PCM
#3: Device that controls engine and powertrain
#4: Directly connected to exhaust manifold

ABBREVIATIONS

id000000801000

ABS	Antilock Brake System
ACC	Accessories
ALR	Automatic Locking Retractor
AMB	Ambient
ATF	Automatic Transaxle Fluid
ATX	Automatic Transaxle
CAN	Controller Area Network
CCM	Comprehensive Component Monitor
CM	Control Module
DC	Drive Cycle
DRL	Day Time Running Light
DSC	Dynamic Stability Control
EBD	Electronic Brakeforce Distribution
EHPAS	Electro Hydraulic Power Assist Steering
ELR	Emergency Locking Retractor
GPS	Global Positioning System
HI	High
HU	Hydraulic Unit
IDS	Integrated Diagnostic Software
IG	Ignition
IN	Intake
INT	Intermittent
KOEO	Key On Engine Off
KOER	Key On Engine Running
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LF	Left Front
LH	Left Hand
LO	Low
LR	Left Rear
M	Motor
MAX	Maximum
MIN	Minimum
MTX	Manual Transaxle
OCV	Oil Control Valve
PAD	Passenger Air Bag Deactivation
PATS	Passive Anti-Theft System
PDS	Portable Diagnostic Software
PID	Parameter Identification
PJB	Passenger Junction Box
POWER MOS FET	Power Metal Oxide Semiconductor Field Effect Transistor
P/W CM	Power Window Control Module
RF	Right Front
RH	Right Hand
RR	Right Rear
SAS	Sophisticated Air Bag Sensor
SST	Special Service Tool
SW	Switch
TCS	Traction Control System
TFT	Transaxle Fluid Temperature
TNS	Tail Number Side Lights
TPMS	Tire Pressure Monitoring System
1GR	First Gear
2GR	Second Gear
3GR	Third Gear
4GR	Fourth Gear
5GR	Fifth Gear

PRE-DELIVERY INSPECTION

id000000801100

Pre-Delivery Inspection Table

Exterior

INSPECT and **ADJUST**, if necessary, the following items to specification:

- ❑Glass, exterior bright metal and paint for damage
- ❑Wheel lug nuts
- ❑All weatherstrips for damage or detachment
- ❑Tire pressures
- ❑Headlight cleaner and fluid level (if equipped)
- ❑Operation of hood release and lock
- ❑Operation of trunk lid and fuel-filler lid opener
- ❑Door operation and alignment including side door and back door
- ❑Headlight aiming

INSTALL the following parts:

- ❑Flap (if equipped)

Under hood—engine off

INSPECT and **ADJUST**, if necessary, the following items to specification:

- ❑Fuel, engine coolant, and hydraulic lines, fittings, connections, and components for leaks
- ❑Engine oil level
- ❑Brake and clutch fluid level
- ❑Windshield washer reservoir fluid level
- ❑Coolant level and specific gravity
- ❑Tightness of water hose clamps
- ❑Tightness of battery terminals, electrolyte level and specific gravity

❑Tension of drive belt

Interior
INSTALL the following items:
❑Fuse for accessories
INSPECT the operations of the following items:
❑Seat controls (slide and recline) and headrests
❑Folding rear seat
❑Door locks, including childproof door locks
❑Seat belts and warning system
❑Ignition switch and steering lock
❑Transaxle range switch
❑Warning buzzers
❑Ignition key reminder alarm
❑Air bag system using warning light
❑Cruise control system (if equipped)
❑Power door lock
❑Shift-lock system (if equipped)
❑Starter interlock
❑All lights including warning, and indicator lights
❑Horn, wipers, and washers
❑Wiper blades performance
Clean wiper blades and windshield, if necessary
❑Audio system
❑Cigarette lighter and clock
❑Power windows (if equipped)
❑Heater, defroster, and air conditioner at various mode selections (if equipped)
INSPECT the following items:
❑Presence of spare fuse
❑Upholstery and interior finish
INSPECT and **ADJUST**, if necessary, the following items:
❑Operation and fit of windows
❑Pedal height and free play of clutch and brake pedal
❑Parking brake

Under hood—engine running at operating temperature
INSPECT the following items:
❑Automatic transaxle fluid level
❑Operation of idle-up system for electrical load, air conditioner or power steering (if equipped)
❑Ignition timing
❑Idle speed
❑Operation of throttle position sensor

On hoist
INSPECT the following items:
❑Manual transaxle oil level
❑Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
❑Tires for cuts or bruises
❑Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage

Road test
INSPECT the following items:
❑Brake operation
❑Operation of gauges
❑Engine general performance
❑Emergency locking retractors and automatic locking retractors
❑Cruise control system (if equipped)
❑Operation of meters and gauges, squeaks, rattles, and abnormal noises

After road test
INSPECT for necessary owner information materials, tools, and spare tire in vehicle
The following items must be completed just before delivery to your customer.
❑Load test battery and charge if necessary (Load test result: Volts)
❑Adjust tire pressure to specification
❑Install fuses for accessories

SCHEDULED MAINTENANCE

id000000801200

Scheduled Maintenance Table for U.S.A., CANADA and Puerto Rico
Schedule 1: Normal driving conditions (U.S.A. only)

- The vehicle is mainly operated where none of the "unique driving conditions" apply.

Maintenance Interval		Number of months or kilometers (miles), whichever comes first							
	Months	6	12	18	24	30	36	42	48
	×1000 km	12	24	36	48	60	72	84	96
	×1000 miles	7.5	15	22.5	30	37.5	45	52.5	60
ENGINE									
Engine valve clearance		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust							
Drive belts (tension)						I			
Engine oil		R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R
COOLING SYSTEM									
Cooling system					I				I
Engine coolant	FL22 type*1	Replace at first 192,000 km (120,000 miles) or 10 years; after that, every 96,000 km (60,000 miles) or 5 years							
	Others	Replace at first 96,000 km (60,000 miles) or 4 years; after that, every 2 years							
FUEL SYSTEM									
Air cleaner element						R			
Fuel lines and hoses*2					I				I
Hoses and tubes for emission*2									I
IGNITION SYSTEM									
Spark plugs		Replace every 120,000 km (75,000 miles)							
CHASSIS and BODY									
Brake lines, hoses and connections					I				I
Disc brakes			I		I		I		I
Tire (Rotation)		Rotate every 12,000 km (7,500 miles)							
Steering operation and linkages					I				I
Front and rear suspension, ball joints and wheel bearing axial play					I				I
Driveshaft dust boots					I				I
Exhaust system and heat shields		Inspect every 72,000 km (45,000 miles) or 5 years							
All locks and hinges		L	L	L	L	L	L	L	L
Bolts and nuts on chassis and body					T				T
AIR CONDITIONER SYSTEM (if installed)									
Cabin air filter		Replace every 40,000 km (25,000 miles) or 2 years							

Chart symbols
I: Inspect and repair, clean, adjust, or replace if necessary.
R: Replace
L: Lubricate
T: Tighten

Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.

*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage/kilometer period to ensure long-term reliability.

Schedule 2: Unique driving conditions (For U.S.A. unique conditions and CANADA/Puerto Rico all conditions)

- Repeated short-distance driving
- Driving in dusty conditions
- Driving with extended use of brakes
- Driving in areas where salt or other corrosive materials are used
- Driving on rough or muddy roads
- Extended periods of idling or low-speed operation
- Driving for long periods in cold temperatures or extremely humid climates

Maintenance Interval		Number of months or kilometers (miles), whichever comes first											
	Months	4	8	12	16	20	24	28	32	36	40	44	48
	×1000 km	8	16	24	32	40	48	56	64	72	80	88	96
	×1000 miles	5	10	15	20	25	30	35	40	45	50	55	60
ENGINE													
Engine valve clearance		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust											
Drive belts (tension)								I					
Engine oil	Puerto Rico	Replace every 5,000 km (3,000 miles) or 3 months											
	Others	R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system							I						I
Engine coolant	FL22 type*1	Replace at first 192,000 km (120,000 miles) or 10 years; after that, every 96,000 km (60,000 miles) or 5 years											
	Others	Replace at first 96,000 km (60,000 miles) or 4 years; after that, every 2 years											
Engine coolant level		I	I	I	I	I	I	I	I	I	I	I	I
FUEL SYSTEM													
Air cleaner element	Puerto Rico						R						R
	Others							R					
Fuel lines and hoses*2							I						I
Hoses and tubes for emission*2													I
IGNITION SYSTEM													
Spark plugs (for LF/L3 engine)		Replace every 120,000 km (75,000 miles)											
Spark plugs (for L3 WITH TC engine)	USA	Replace every 96,000 km (60,000 miles)											
	Others*3	Replace every 120,000 km (75,000 miles)											
ELECTRICAL SYSTEM													
Function of all lights		I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY													
Brake lines, hoses and connections							I						I
Brake and clutch fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes				I			I			I			I
Tire (Rotation)		Rotate every 8,000 km (5,000 miles)											
Tire inflation pressure and tire wear		I	I	I	I	I	I	I	I	I	I	I	I
Steering operation and linkages							I						I
Power steering fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Front and rear suspension, ball joints and wheel bearing axial play							I						I
Driveshaft dust boots							I						I
Exhaust system and heat shields		Inspect every 72,000 km (45,000 miles) or 5 years											
All locks and hinges		L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Bolts and nuts on chassis and body							T						T
AIR CONDITIONER SYSTEM (if installed)													
Cabin air filter		Replace every 40,000 km (25,000 miles) or 2 years											

Chart symbols
I: Inspect and repair, clean, adjust, or replace if necessary.
R: Replace
L: Lubricate
T: Tighten

Remarks
- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.

*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage/kilometer period to ensure long-term reliability.

*3: If the vehicle is operated under any of the following conditions, replace the spark plugs every 96,000 km (60,000 miles) or shorter.
a. Repeated short-distance driving
b. Extended periods of idling or low-speed operation
c. Driving for long periods in cold temperatures or extremely humid climates

Scheduled Maintenance Table for Mexico
Schedule 1: Normal driving conditions
- The vehicle is mainly operated where none of the "unique driving conditions" apply.

Maintenance Interval		Number of months or kilometers, whichever comes first											
	Months	6	12	18	24	30	36	42	48	54	60	66	72
	×1000 km	10	20	30	40	50	60	70	80	90	100	110	120
ENGINE													
Engine valve clearance		Audible inspect every 120,000 km, if noisy, adjust											
Drive belts (tension)					I				I				I
Engine oil		R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system					I				I				I
Engine coolant	FL22 type*1	Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years											
	Others	Replace every 40,000 km or 2 years											
FUEL SYSTEM													
Air cleaner element			R		R		R		R		R		R
Fuel lines and hoses					I*2				I*2				I
Hoses and tubes for emission					I*2				I*2				I
Fuel filter					R				R				R
IGNITION SYSTEM													
Spark plugs		Replace every 60,000 km											
CHASSIS and BODY													
Brake lines, hoses and connections			I		I		I		I		I		I
Brake and clutch fluid level		I	I	I		I	I	I		I	I	I	
Brake fluid					R				R				R
Disc brakes		I	I	I	I	I	I	I	I	I	I	I	I
Tire (Rotation)		Rotate every 10,000 km											
Tire inflation pressure and tire wear		I	I	I	I	I	I	I	I	I	I	I	I
Steering operation and linkages		I	I	I	I	I	I	I	I	I	I	I	I
Power steering fluid level		I	I	I	I	I	I	I	I	I	I	I	I
Front and rear suspension, ball joints and wheel bearing axial play			I		I		I		I		I		I
Driveshaft dust boots			I		I		I		I		I		I
Exhaust system and heat shields			I		I		I		I		I		I
All locks and hinges		L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level		I	I	I	I	I	I	I	I	I	I	I	I

Maintenance Interval	Number of months or kilometers, whichever comes first												
	Months	6	12	18	24	30	36	42	48	54	60	66	72
	×1000 km	10	20	30	40	50	60	70	80	90	100	110	120
Bolts and nuts on chassis and body			T		T		T		T		T		T
AIR CONDITIONER SYSTEM (if installed)													
Cabin air filter					R				R				R

Chart symbols:
I: Inspect and repair, clean, adjust, or replace if necessary.
R: Replace
L: Lubricate
C: Clean
T: Tighten

Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.

*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or kilometer period to ensure long-term reliability.

Schedule 2: Unique Driving Conditions

- Repeated short-distance driving
- Driving in dusty conditions
- Driving with extended use of brakes
- Driving in areas where salt or other corrosive materials are used
- Driving on rough or muddy roads
- Extended periods of idling or low-speed operation
- Driving for long periods in cold temperatures or extremely humid climates
- Driving in extremely hot conditions
- Driving in mountainous conditions continually

Maintenance Interval		Number of months or kilometers, whichever comes first											
	Months	3	6	9	12	15	18	21	24	27	30	33	36
	×1000 km	5	10	15	20	25	30	35	40	45	50	55	60
ENGINE													
Engine valve clearance		Audible inspect every 120,000 km, if noisy, adjust											
Drive belts (tension)									I				
Engine oil		R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system									I				
Engine coolant	FL22 type *1	Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years											
	Others	Replace every 40,000 km or 2 years											
Engine coolant level		I	I	I	I	I	I	I	I	I	I	I	I
FUEL SYSTEM													
Air cleaner element			C		R		C		R		C		R
Fuel lines and hoses									I*2				
Hoses and tubes for emission									I*2				
Fuel filter									R				
IGNITION SYSTEM													
Spark plugs		Replace every 60,000 km											
ELECTRICAL SYSTEM													
Function of all lights		I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY													
Brake lines, hoses and connections					I				I				I
Brake and clutch fluid level			I		I		I				I		I
Brake fluid									R				
Disc brakes			I		I		I		I		I		I
Tire (Rotation)		Rotate every 10,000 km											
Tire inflation pressure and tire wear			I		I		I		I		I		I
Steering operation and linkages			I		I		I		I		I		I
Power steering fluid level			I		I		I		I		I		I
Front and rear suspension, ball joints and wheel bearing axial play					I				I				I
Driveshaft dust boots					I				I				I
Exhaust system and heat shields					I				I				I
All locks and hinges			L		L		L		L		L		L
Washer fluid level			I		I		I		I		I		I
Bolts and nuts on chassis and body					T				T				T
AIR CONDITIONER SYSTEM (if installed)													
Cabin air filter					R				R				R

Cont.

Maintenance Interval		Number of months or kilometers, whichever comes first											
	Months	39	42	45	48	51	54	57	60	63	66	69	72
	×1000 km	65	70	75	80	85	90	95	100	105	110	115	120
ENGINE													
Engine valve clearance		Audible inspect every 120,000 km, if noisy, adjust											
Drive belts (tension)					I								I
Engine oil		R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system					I								I
Engine coolant	FL22 type*1	Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years											
	Others	Replace every 40,000 km or 2 years											
Engine coolant level		I	I	I	I	I	I	I	I	I	I	I	I
FUEL SYSTEM													
Air cleaner element			C		R		C		R		C		R
Fuel lines and hoses					I*2								I
Hoses and tubes for emission					I*2								I
Fuel filter					R								R
IGNITION SYSTEM													
Spark plugs		Replace every 60,000 km											
ELECTRICAL SYSTEM													
Function of all lights		I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY													
Brake lines, hoses and connections					I				I				I
Brake and clutch fluid level			I				I		I		I		
Brake fluid					R								R
Disc brakes			I		I		I		I		I		I
Tire (Rotation)		Rotate every 10,000 km											
Tire inflation pressure and tire wear			I		I		I		I		I		I
Steering operation and linkages			I		I		I		I		I		I
Power steering fluid level			I		I		I		I		I		I
Front and rear suspension, ball joints and wheel bearing axial play					I				I				I
Driveshaft dust boots					I				I				I
Exhaust system and heat shields					I				I				I
All locks and hinges			L		L		L		L		L		L
Washer fluid level			I		I		I		I		I		I
Bolts and nuts on chassis and body					T				T				T
AIR CONDITIONER SYSTEM (if installed)													
Cabin air filter					R				R				R

Chart symbols:
I: Inspect and repair, clean, adjust, or replace if necessary.
R: Replace
L: Lubricate
C: Clean
T: Tighten
Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.

*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or kilometer period to ensure long-term reliability.

ENGINE

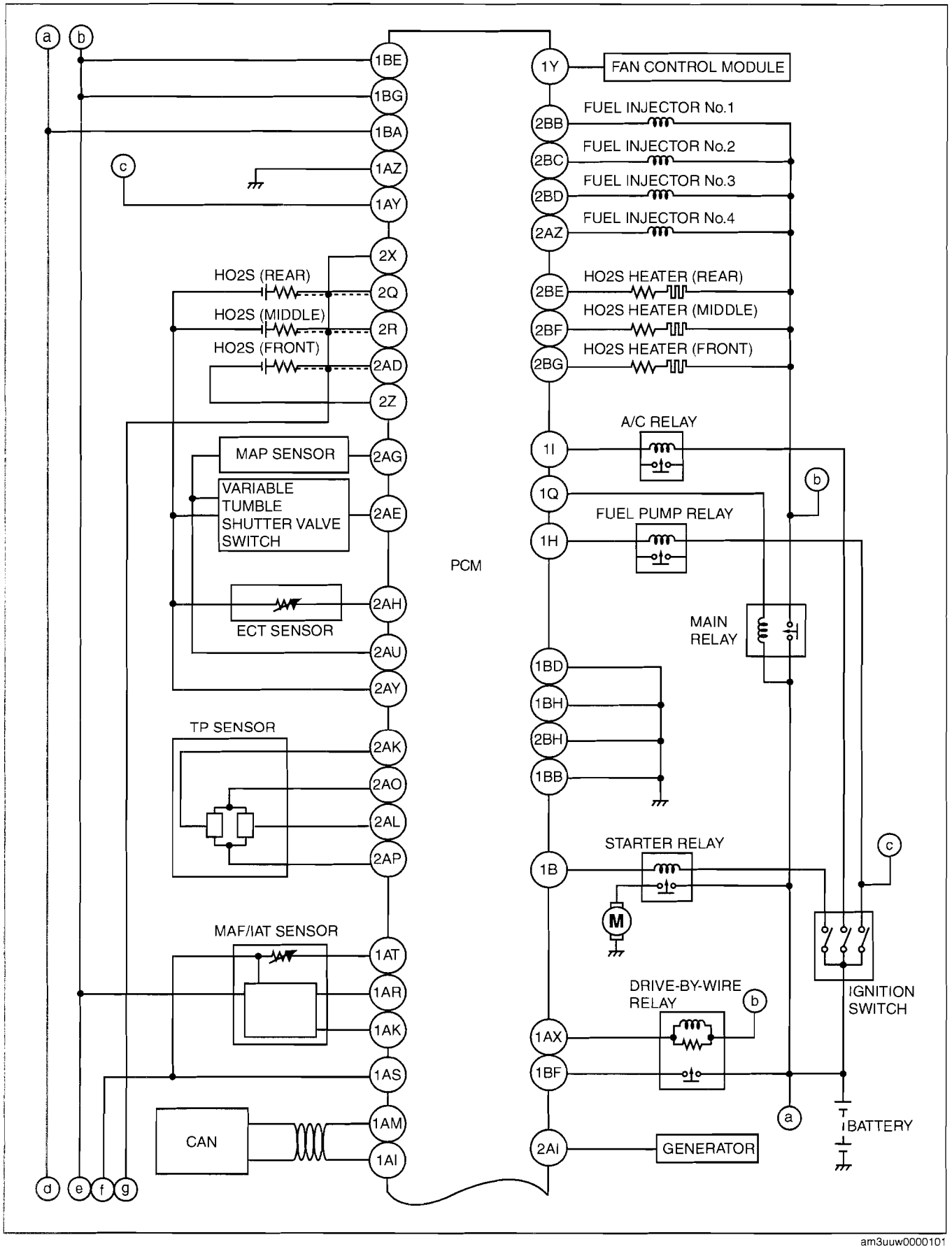
01 SECTION

01-02A ON-BOARD DIAGNOSTIC [LF, L3]

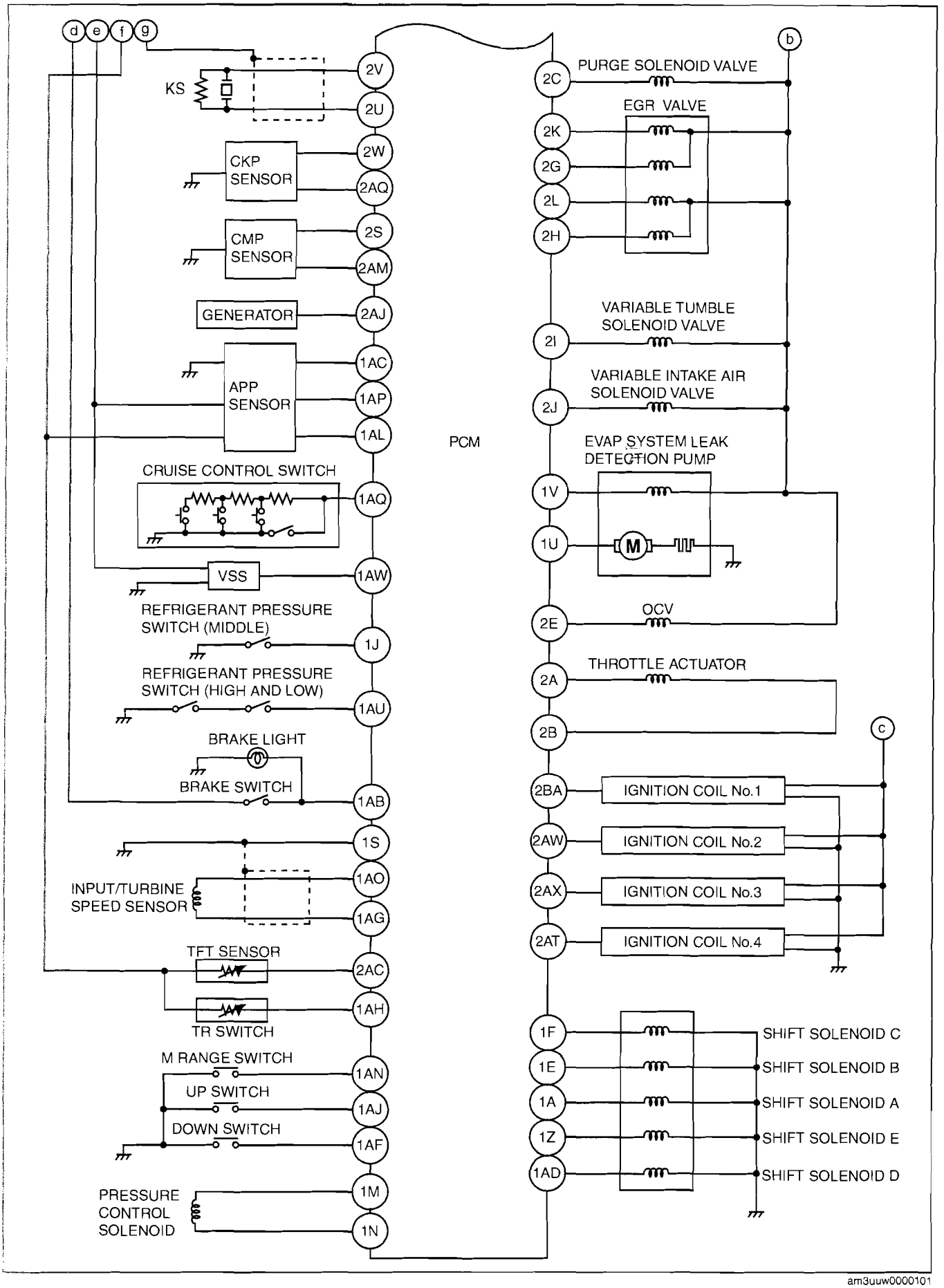
ON-BOARD DIAGNOSTIC WIRING DIAGRAM[LF, L3]

id0102a3800100

California Emission Regulation Applicable Model with LF ATX

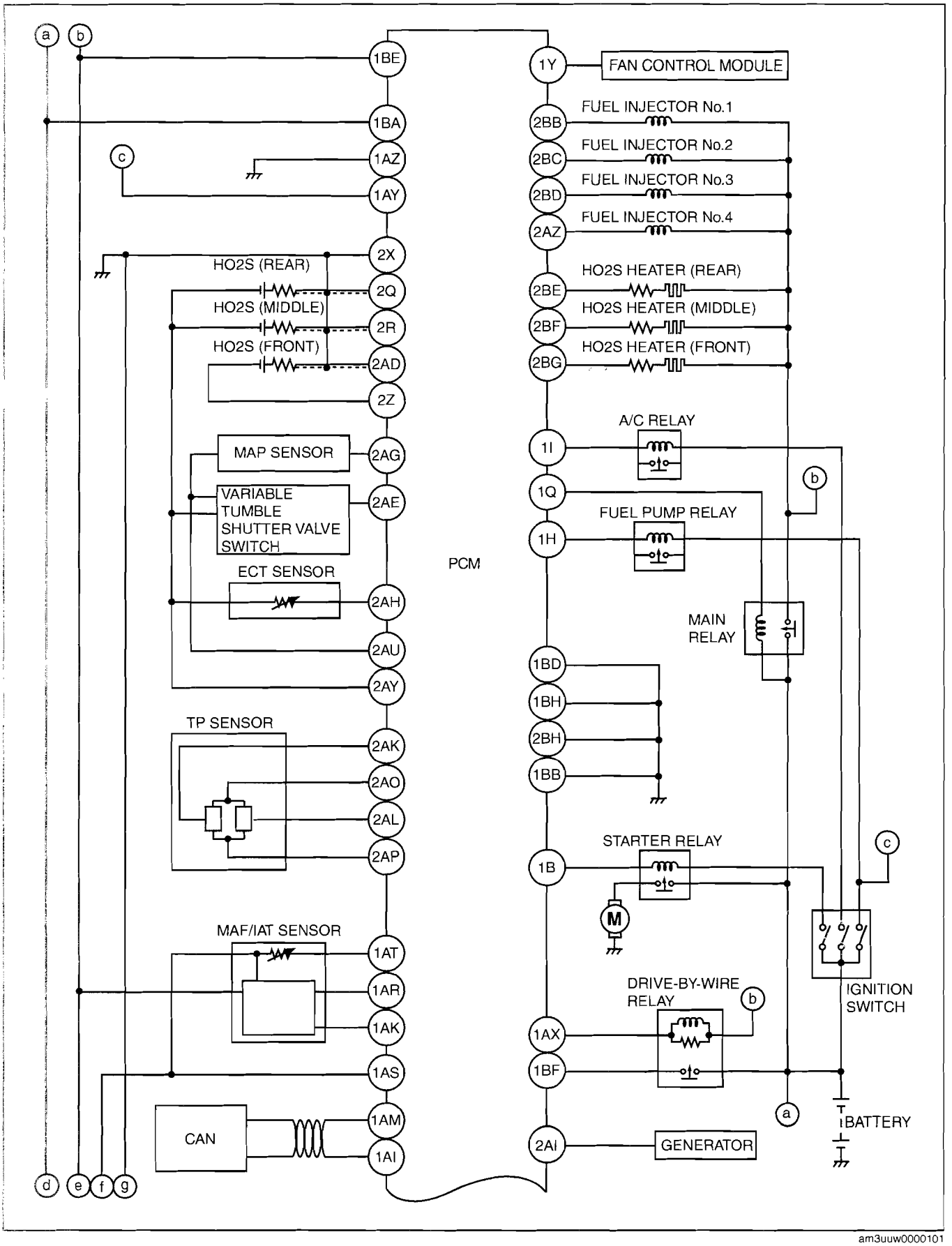


am3uuw0000101

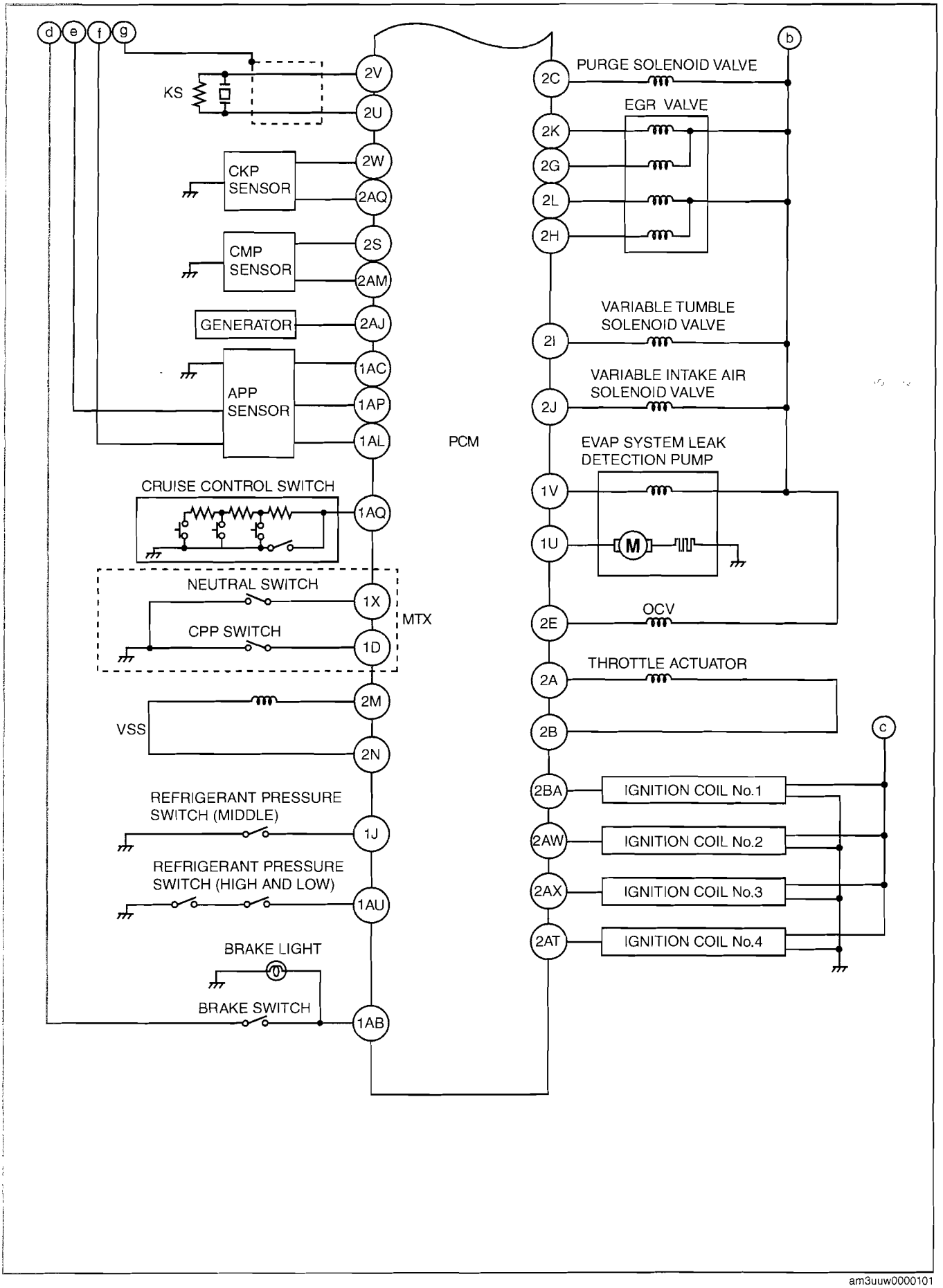


am3uuw0000101

California Emission Regulation Applicable Model with LF MTX, L3

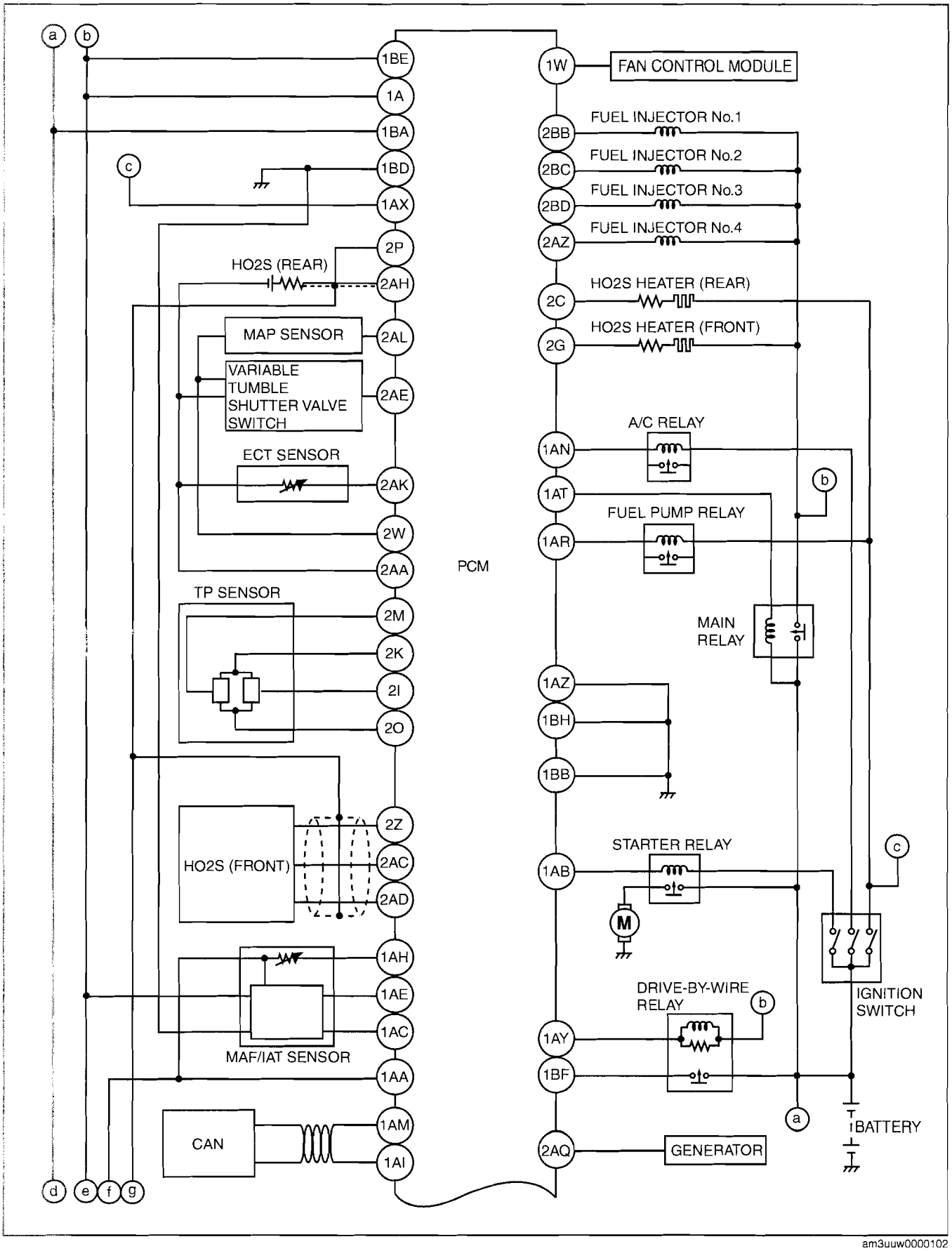


am3uuw0000101

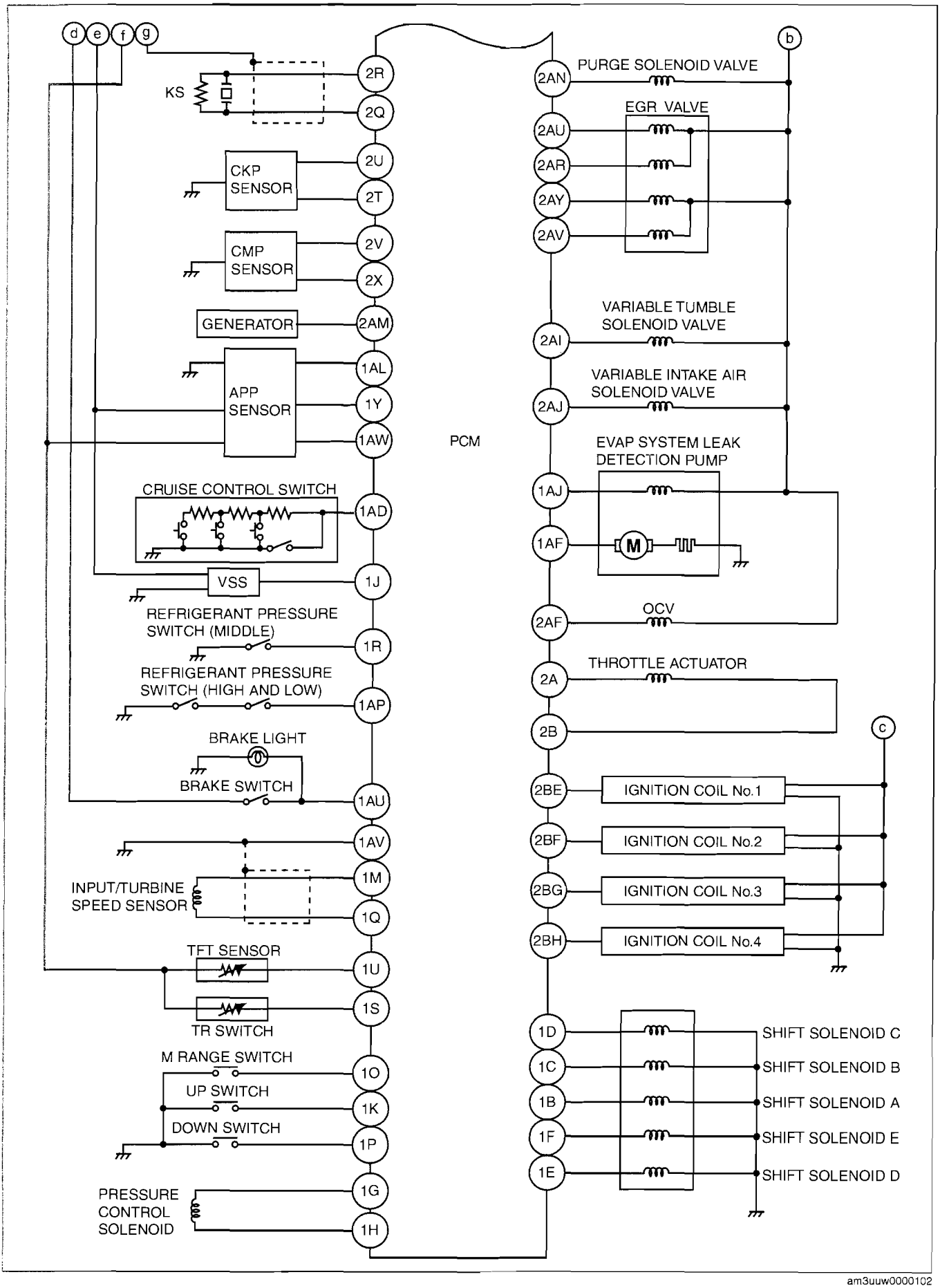


am3uuw0000101

Except for California Emission Regulation Applicable Model with LF ATX

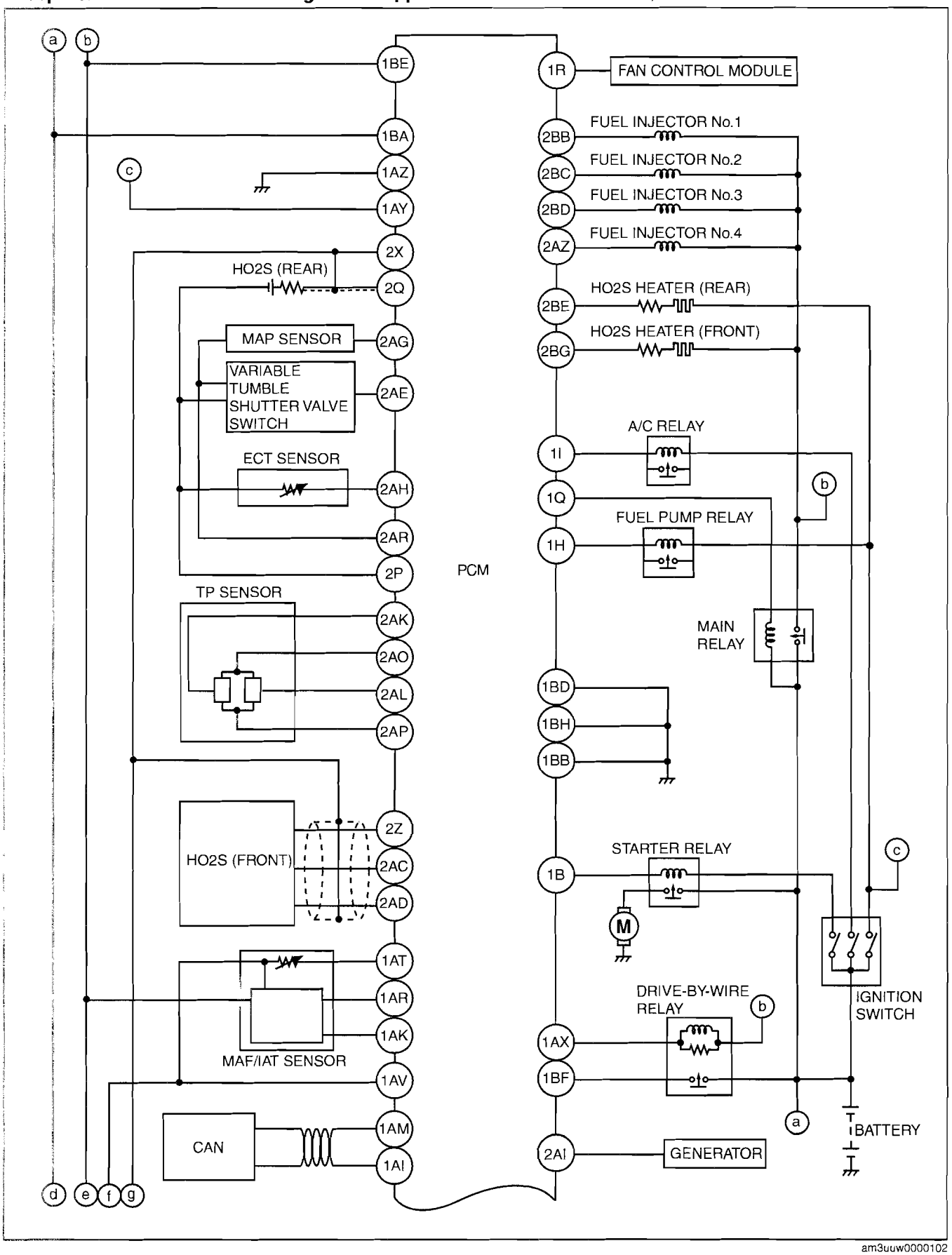


am3uuw0000102

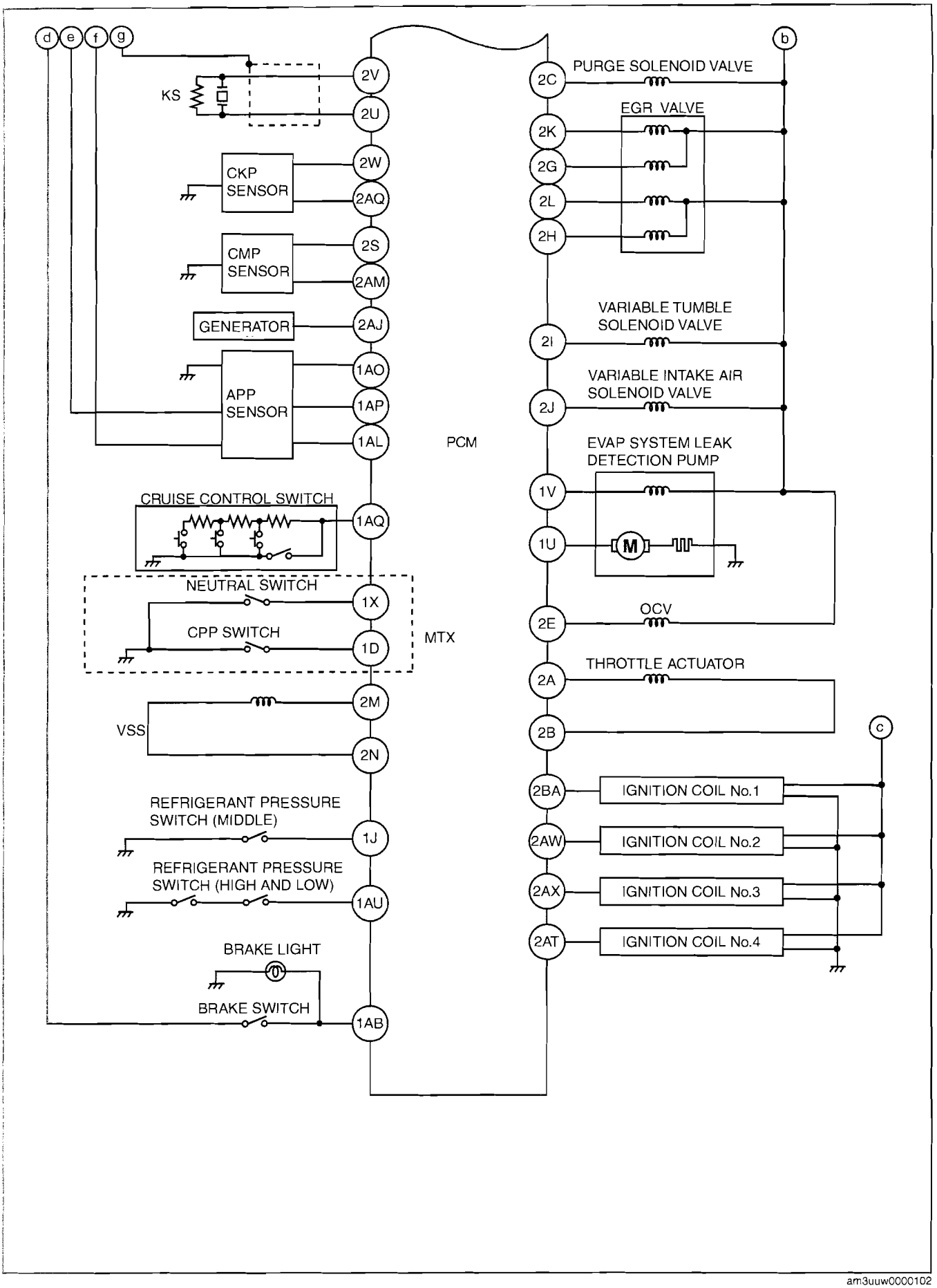


am3uuw0000102

Except for California Emission Regulation Applicable Model with LF MTX, L3



am3uuw0000102



am3uuw0000102

MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART[LF, L3]

id0102a3800200

California Emission Regulation Applicable Model

x: Applicable

Component	Oxygen sensor monitor	Oxygen sensor heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	Evaporative emission system monitor	EGR system monitor	Thermostat monitor
Input								
Battery		x		x		x		
Ignition switch	x	x				x		
A/C switch, refrigerant pressure switch (high, low pressure)							x	x
TP sensor	x		x	x	x	x	x	
ECT sensor	x	x	x	x	x	x	x	x
IAT sensor	x	x	x		x	x	x	x
MAF sensor	x	x	x	x	x		x	x
HO2S (front)	x	x	x		x			
HO2S (middle)	x	x	x		x			
HO2S (rear)	x	x			x			
Fuel gauge sender unit						x		
BARO sensor	x	x	x		x	x		
MAP sensor							x	
CMP sensor				x				
CKP sensor	x	x	x	x	x	x	x	x
VSS							x	x
Output								
Fuel injector					x			
HO2S heater (front)		x						
HO2S heater (middle)		x						
HO2S heater (rear)		x						
EGR valve							x	
Purge solenoid valve	x		x		x	x		
EVAP system leak detection pump						x		
MIL	x	x	x	x	x	x	x	x
DLC-2	x	x	x	x	x	x	x	x

Except for California Emission Regulation Applicable Model

x: Applicable

Component	Oxygen sensor monitor	Oxygen sensor heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	Evaporative emission system monitor	EGR system monitor	Thermostat monitor
Input								
Battery		x		x		x		
Ignition switch	x	x				x		
A/C switch, refrigerant pressure switch (high, low pressure)							x	x
TP sensor	x		x	x	x	x	x	
ECT sensor	x	x	x	x	x	x	x	x
IAT sensor	x		x		x	x	x	x
MAF sensor	x	x	x	x	x		x	x
HO2S (front)	x	x	x		x			
HO2S (rear)	x	x			x			
Fuel gauge sender unit						x		
BARO sensor	x					x		
MAP sensor							x	
CMP sensor				x				
CKP sensor	x	x	x	x	x	x	x	x
VSS	x					x	x	x
Output								
Fuel injector					x			
HO2S heater (front)		x						
HO2S heater (rear)		x						
EGR valve							x	
Purge solenoid valve	x		x		x	x		
EVAP system leak detection pump						x		
MIL	x	x	x	x	x	x	x	x
DLC-2	x	x	x	x	x	x	x	x

OBD PENDING TROUBLE CODE[LF, L3]

id0102a3816200

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the PCM judges that the system returned to normal or the problem was mistakenly detected, and deletes the pending code. If the problem is found in a second drive cycle too, the PCM judges that the system has failed, and the DTC is stored.

OBD FREEZE FRAME DATA[LF, L3]

id0102a3815900

- This is the technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of Fuel system or Misfire DTCs. Once freeze frame data for Fuel system or Misfire DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD ON-BOARD SYSTEM READINESS TEST[LF, L3]

id0102a3816000

- This shows the OBD systems operating status. If any monitor function is incomplete, M-MDS will identify which monitor function has not been completed. The Fuel system, Misfire and CCM are continuous monitoring-type functions. The HO2S, EGR system and Catalyst will be monitored under drive cycles. The OBD diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD READ/CLEAR DIAGNOSTIC TEST RESULT[LF, L3]

id0102a3816300

- This retrieves all stored DTCs in the PCM and clears the on-board readiness test results, freeze frame data, DTC and pending trouble code.

OBD PARAMETER IDENTIFICATION (PID) ACCESS[LF, L3]

id0102a3816100

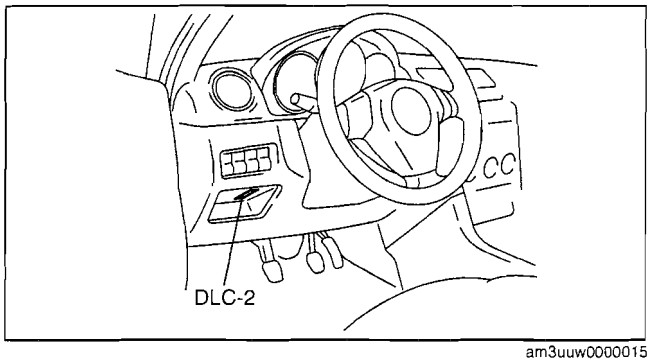
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since the PID values for output devices are the PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST[LF, L3]

id0102a3801000

DTC Reading Procedure

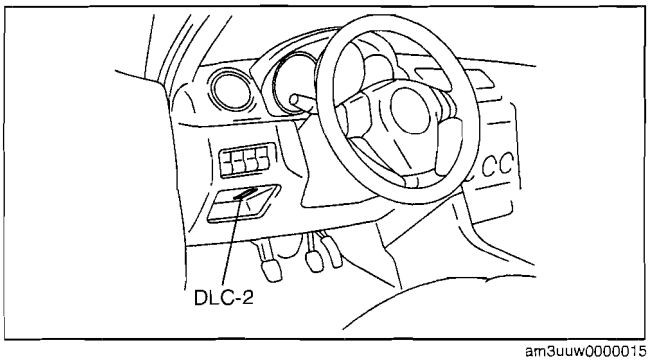
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Verify the DTC according to the directions on the M-MDS screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".



am3uuw0000015

Pending Trouble Code Access Procedure

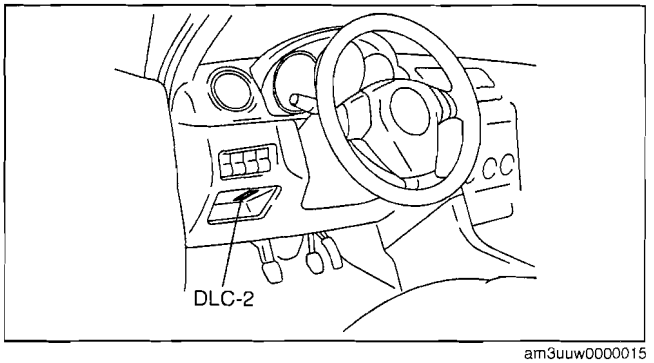
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Retrieve the pending trouble codes according to the directions on the M-MDS screen.



am3uuw0000015

Freeze Frame PID Data Access Procedure

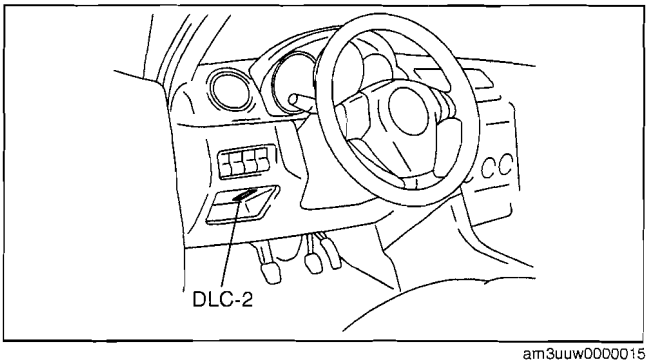
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Retrieve the freeze frame PID data according to the directions on the M-MDS screen.



am3uuw0000015

On-Board System Readiness Tests Access Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Powertrain".
     3. Select "OBD Test Modes".
     4. Select "Mode 1 Powertrain Data".
     5. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "OBDII Modes".
     2. Select "Mode 1 Powertrain Data".
     3. Select "PCM".
3. Then, select the "***SUP" and "***EVAL" PIDs in the PID selection screen.
4. Monitor those PIDs and check it system monitor is completed.



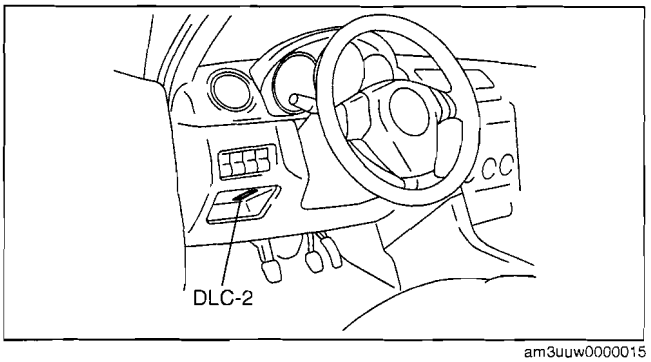
am3uuw0000015

PID/DATA Monitor and Record Procedure

Note

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.

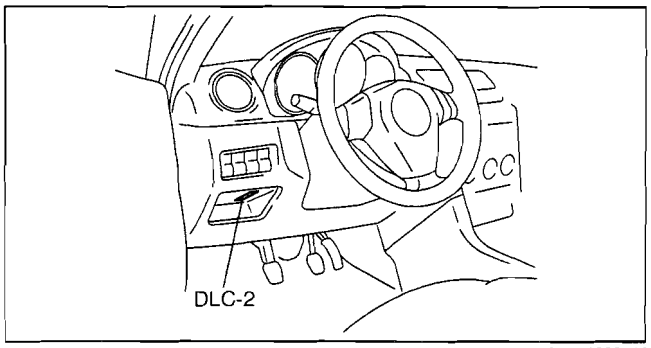
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "DataLogger".
3. Select the PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000015

Diagnostic Monitoring Test Results Access Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Powertrain".
     3. Select "OBD Test Modes".
     4. Select "Mode 6 On-Board Test Results".
   - When using the PDS (Pocket PC)
     1. Select "OBDII Modes".
     2. Select "Mode 6 On-Board Test Results".
3. Verify the diagnostic monitoring test results according to the directions on the screen.

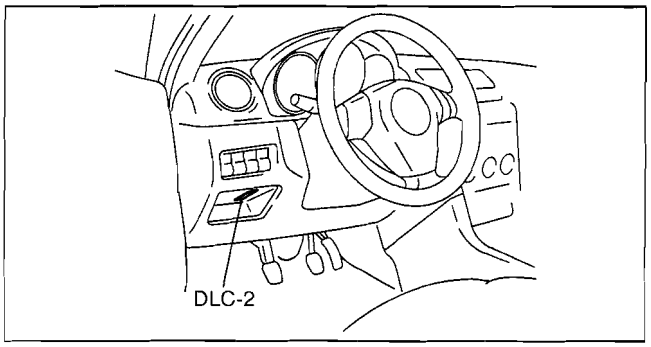


am3uuw0000015

AFTER REPAIR PROCEDURE[LF, L3]

id0102a3801100

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
     5. Select "Retrieve CMDTCs".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
     4. Select "Retrieve CMDTCs".
3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.

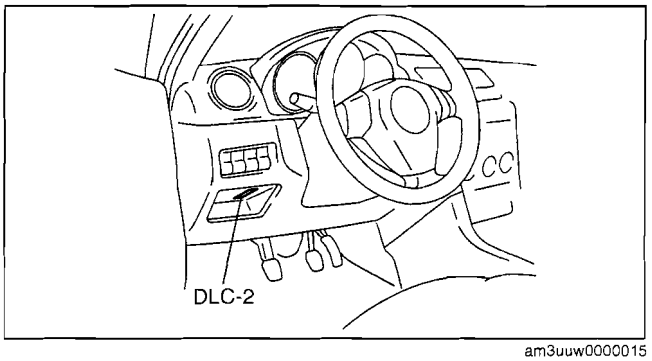


am3uuw0000015

KOEO/KOER SELF TEST[LF, L3]

id0102a3801200

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
3. Then, select the "KOEO On Demand Self Test" or "KOER On Demand Self Test" and perform procedures according to directions on the M-MDS screen.
4. Verify the DTC according to the directions on the M-MDS screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".



am3uuw0000015

OBD-II DRIVE MODE[LF, L3]

id0102a3801300

- Using the OBD-II drive mode, the monitoring item requested by OBD-II regulations can be easily diagnosed.
- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- The OBD-II drive mode is divided into the specific drive mode and single drive mode.
- For the specific drive mode, specified drive modes have been set for each individual monitoring item requested by OBD-II regulations, and they can be diagnosed individually. For the single drive mode, the entire monitoring item requested by OBD-II regulations can be diagnosed.
- The following modes are in the specific drive mode. The applicable system is diagnosed by driving in the following drive modes.
  - PCM Adaptive Memory Produce Drive Mode
  - EGR System Repair Verification Drive Mode
  - HO2S heater, HO2S, and TWC Repair Verification Drive Mode
  - EVAP System Repair Verification Drive Mode
- The following systems are diagnosed with the single drive mode.
  - EGR system
  - Oxygen sensor (HO2S)
  - Oxygen sensor heater
  - Catalytic converter (TWC)
  - Fuel, misfire and evaporative (EVAP) system

Caution

- **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.**
- **When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD function and inspect later.**

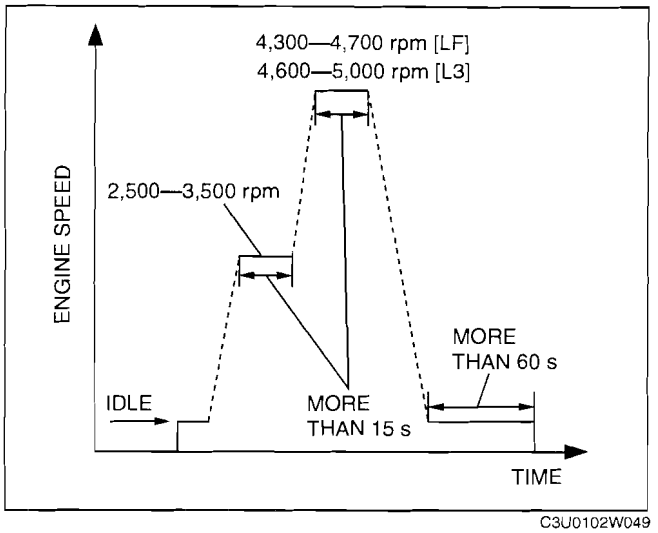
Note

- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the M-MDS to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - The OBD-II system detects the malfunction.
  - The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The M-MDS can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.
- The OBD monitoring status can be confirmed with the ignition switch operation. During KOEO, the MIL illuminates for a fail-light inspection for **approx. 17 s**. The OBD monitoring status is confirmed after the fail-light inspection.
  - If all of the diagnosis is completed even one time, the MIL will continue to illuminate.
  - If all of the diagnosis is not completed, the MIL flashes for **approx. 7 s**, and then it illuminates until the engine is started.

PCM Adaptive Memory Production Drive Mode

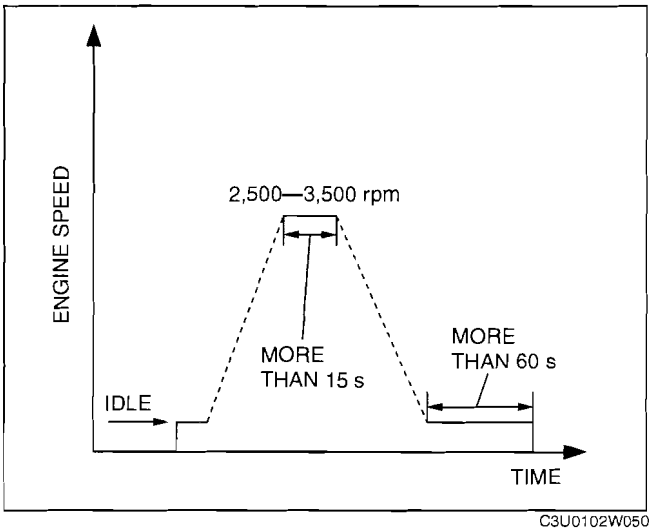
1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Perform no load racing at the engine speed shown in the graph, then idle the engine for more than **60 s** after the cooling fan has stopped. If possible, monitor RPM PID for engine speed during this procedure.

Except for California emission regulation applicable model



C3U0102W049

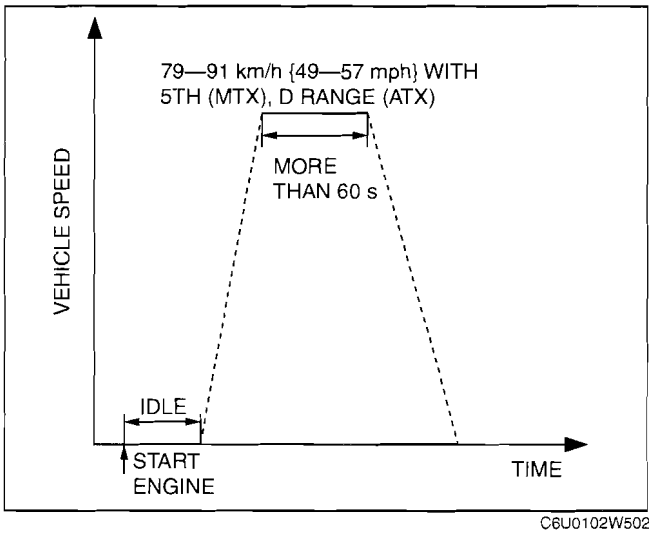
California emission regulation applicable model



C3U0102W050

EGR System Repair Verification Drive Mode

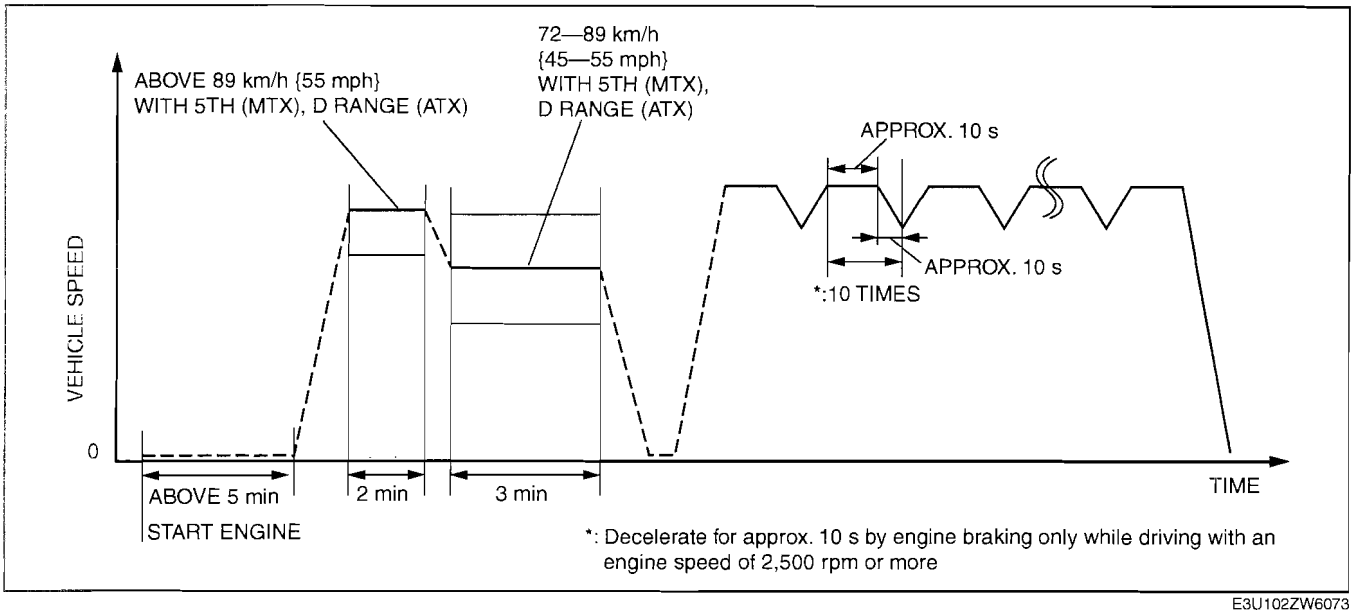
1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within specification, repair has not been completed.
6. Verify no DTCs are available.



C6U0102W502

HO2S heater, HO2S, and TWC Repair Verification Drive Mode

1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified.



E3U102ZW6073

4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within the specification, repair has not been completed.
6. Verify no DTCs are available.

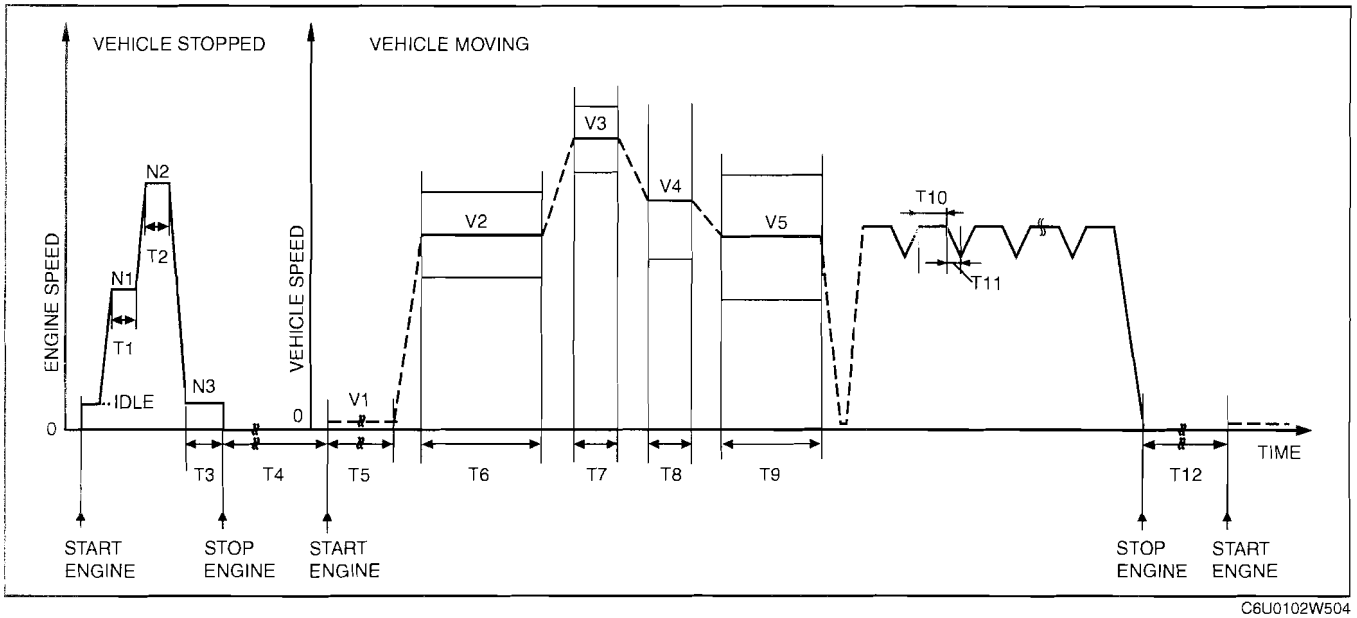
EVAP System Repair Verification Drive Mode

Note
- If "EVAP System Repair Verification Drive Mode" cannot be performed (it is impossible to drive the vehicle under this drive mode condition), perform evaporative system test procedure as an alternative. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)

1. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications before engine is started to initiate the evaporative system test.
   - BARO: **72.3 kPa {542 mmHg, 21.3 inHg}** or higher
   - IAT: **5—40 °C {41—104 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
2. Clear DTC from PCM memory using M-MDS.
3. Start the engine and idle it for **more than 10 s**, then turn the ignition switch off.
4. Leave vehicle for **5 hours or more**.
5. Start the engine and idle for **more than 15 min**.
6. Drive the vehicle at an engine speed of **65—80 km/h {40—50 mph}** for **more than 5 min**.
7. Stop the vehicle and turn the ignition switch off.
8. Leave vehicle as it is for **10 min or more**.
9. Start the engine.
10. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
    - If completed, the OBD monitoring status items change from non-completed to completed.
    - If not completed, turn the ignition switch off then go back to Step 1.
11. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
    - If detected values are not within specification, repair has not completed.
12. Verify no DTCs are available.

PCM Adaptive Memory Production, EGR, HO2S heater, HO2S, TWC, and EVAP System Repair Verification Drive Mode

1. Start the engine and warm it up completely.
2. Clear the DTC from the PCM memory using the M-MDS.
3. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
4. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications from Step 5 to Step 6.
   - BARO: **more than 72.3 kPa {542 mmHg, 21.3 inHg}**
   - IAT: **5—40 °C {41—104 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
5. With the vehicle stopped, race the engine at the engine speed indicated, and then drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified. If possible, monitor RPM PID for engine speed during this procedure.



C6U0102W504

Step	Time	Engine speed (rpm)	Vehicle speed (km/h {mph})	Vehicle condition
1	T1: More than 15 s	N1: 2,500—3,500	0 {0}	—
2*	T2: More than 15 s	N2: 4,300—4,700 [LF] 4,600—5,000 [L3]	0 {0}	—
3	T3: More than 60 s	N3: Idle	0 {0}	Idle the engine after the cooling fan has stopped
4	T4: More than 5 h	0	0 {0}	Keep the ignition switch off
5	T5: More than 15 min	Idle	V1: 0 {0}	—
6	T6: 5 min	—	V2: 65—80 {40—50}	MTX: 5TH ATX: D range
7	T7: 1 min	—	V3: 79—91 {49—57}	MTX: 5TH ATX: D range
8	T8: 2 min	—	V4: Above 89 {55}	MTX: 5TH ATX: D range
9	T9: 3 min	—	V5: 72—89 {45—55}	MTX: 5TH ATX: D range
10	T10: Approx. 10 s	Above 2,500	—	—
11	T11: Approx. 10 s	—	—	Decelerate by engine braking only (10 times)
12	T12: More than 10 min	0	0 {0}	Keep the ignition switch off

* : California emission regulation applicable model is not applicable.

6. Turn the ignition switch off.
7. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
   - If completed, all of the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then perform the applicable specific drive mode for any monitoring item that was not in the detection condition.
8. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
   - If detected values are not within specification, repair has not been completed.

DIAGNOSTIC MONITORING TEST RESULTS[LF, L3]

id0102a3801400

- The purpose of this test mode is to confirm the result of OBD-II monitor diagnostic test results. The result values stored when particular monitor is completed are displayed. If the monitor is not completed, initial value is displayed.

TEST ID	Description	Related system
10:01:80	HO2S (Front) lean-to-rich slow response (calculated)	HO2S
10:01:81	HO2S (Front) rich-to-lean slow response (calculated)	
10:01:82	HO2S (Front) lean-to-rich delayed response (calculated)	
10:01:83	HO2S (Front) rich-to-lean delayed response (calculated)	
10:02:03*2	Low HO2S (Rear) voltage for switch time calculation (constant)	
10:02:04*2	High HO2S (Rear) voltage for switch time calculation (constant)	
10:02:05*2	HO2S (Rear) rich-to-lean response time (calculated)	
10:02:85*1	HO2S (Rear) rich-to-lean response time (calculated)	
10:21:80	HO2S (Front) and HO2S (Rear) switching time ratio	Catalyst
10:31:83	EGR pressure variation	EGR
10:3A:80	EVAP system leak detection pump gross leak check	EVAP
10:3B:80	EVAP system leak detection pump small leak check	
10:3C:80*1	EVAP system leak detection pump very small leak check	
10:3D:80	Purge flow monitor	
10:A2:0B	Cylinder No.1 average misfire counts for last 10 DC	Misfire
10:A2:0C	Cylinder No.1 misfire counts for last/current DC	
10:A3:0B	Cylinder No.2 average misfire counts for last 10 DC	
10:A3:0C	Cylinder No.2 misfire counts for last/current DC	
10:A4:0B	Cylinder No.3 average misfire counts for last 10 DC	
10:A4:0C	Cylinder No.3 misfire counts for last/current DC	
10:A5:0B	Cylinder No.4 average misfire counts for last 10 DC	
10:A5:0C	Cylinder No.4 misfire counts for last/current DC	
10:E1:80	Heat radiation ratio	Thermostat
10:E1:81	Engine coolant temperature	

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

DTC TABLE[LF, L3]

id0102a3801500

×: Applicable
—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
B1342	PCM malfunction	—	—	Other	C, O	×	(See 01-02A-30 DTC B1342[LF, L3].)
P0011	CMP timing over-advanced	ON	1	CCM	C, R	×	(See 01-02A-30 DTC P0011[LF, L3].)
P0012	CMP timing over-retarded	ON	2	CCM	C, R	×	(See 01-02A-32 DTC P0012[LF, L3].)
P0016	CKP-CMP correlation	ON	2	CCM	C	×	(See 01-02A-34 DTC P0016[LF, L3].)
P0030	Front HO2S heater control circuit problem	ON	2	HO2S heater	C, O, R	×	(See01-02A-35 DTC P0030[LF, L3].)
P0031	Front HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See 01-02A-40 DTC P0031[LF, L3].)
P0032	Front HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(See 01-02A-44 DTC P0032[LF, L3].)
P0037	Middle HO2S heater circuit low input*2 Rear HO2S heater circuit low input*3	ON	2	HO2S heater	C, O, R	×	(See 01-02A-48 DTC P0037[LF, L3].)
P0038	Middle HO2S heater circuit high input*2 Rear HO2S heater circuit high input*3	ON	2	HO2S heater	C, O, R	×	(See 01-02A-52 DTC P0038[LF, L3].)
P0043*2	Rear HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See 01-02A-56 DTC P0043[LF, L3].)
P0044*2	Rear HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(See 01-02A-58 DTC P0044[LF, L3].)
P0069	Manifold absolute pressure/atmospheric pressure correlation	ON	2	CCM	C	×	(See 01-02A-60 DTC P0069[LF, L3].)
P0101	MAF sensor circuit range/performance problem	ON	2	CCM	C	×	(See 01-02A-61 DTC P0101[LF, L3].)
P0102	MAF sensor circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-63 DTC P0102[LF, L3].)
P0103	MAF sensor circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-65 DTC P0103[LF, L3].)
P0107	MAP sensor circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-67 DTC P0107[LF, L3].)
P0108	MAP sensor circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-69 DTC P0108[LF, L3].)
P0111	IAT sensor circuit range/performance problem	ON	2	CCM	C	×	(See 01-02A-71 DTC P0111[LF, L3].)
P0112	IAT sensor circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-72 DTC P0112[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P0113	IAT sensor circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-74 DTC P0113[LF, L3].)
P0116	Engine coolant temperature circuit range/performance	ON	1	Engine cooling system	C	×	(See 01-02A-76 DTC P0116[LF, L3].)
P0117	ECT sensor circuit low input	ON	1	Engine cooling system	C, O, R	×	(See 01-02A-78 DTC P0117[LF, L3].)
P0118	ECT sensor circuit high input	ON	1	Engine cooling system	C, O, R	×	(See 01-02A-80 DTC P0118[LF, L3].)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-82 DTC P0122[LF, L3].)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-84 DTC P0123[LF, L3].)
P0125	Excessive time to enter closed loop fuel control	ON	2	Engine cooling system	C	×	(See 01-02A-86 DTC P0125[LF, L3].)
P0126 P0128	Coolant thermostat stuck open	ON	2	Engine cooling system	C	×	(See 01-02A-87 DTC P0126, P0128[LF, L3].)
P0130*2	Front HO2 circuit problem	ON	2	HO2S	C, O, R	×	(See01-02A-90 DTC P0130[LF, L3].)
P0131	Front HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See 01-02A-91 DTC P0131[LF, L3].)
P0132	Front HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See 01-02A-95 DTC P0132[LF, L3].)
P0133	Front HO2S circuit problem	ON	2	HO2S	C	×	(See 01-02A-99 DTC P0133[LF, L3].)
P0134	Front HO2S no activity detected	ON	2	HO2S	C, R	×	(See 01-02A-102 DTC P0134[LF, L3].)
P0137*3	Rear HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See01-02A-107 DTC P0137[LF, L3].)
P0138	Middle HO2S circuit high input*2 Rear HO2S circuit high input*3	ON	2	HO2S	C, O, R	×	(See 01-02A-109 DTC P0138[LF, L3].)
P0139	Middle HO2S circuit problem*2 Rear HO2S circuit problem*3	ON	2	HO2S	C	×	(See 01-02A-111 DTC P0139[LF, L3].)
P0140*3	Rear HO2S no activity detected	ON	2	HO2S	C, R	×	(See 01-02A-115 DTC P0140[LF, L3].)
P0144*2	Rear HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See 01-02A-118 DTC P0144[LF, L3].)
P0171*2	Fuel trim system too lean	ON	2	Fuel system	C, R	×	(See 01-02A-120 DTC P0171[LF, L3].)
P0172*2	Fuel trim system too rich	ON	2	Fuel system	C, R	×	(See 01-02A-123 DTC P0172[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P0222	TP sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-125 DTC P0222[LF, L3].)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-127 DTC P0223[LF, L3].)
P0300	Random misfire detected	Flash/ ON	1 or 2	Misfire	C, R	×	(See 01-02A-129 DTC P0300[LF, L3].)
P0301	Cylinder No.1 misfire detected	Flash/ ON	1 or 2	Misfire	C, R	×	(See 01-02A-132 DTC P0301, P0302, P0303, P0304[LF, L3].)
P0302	Cylinder No.2 misfire detected	Flash/ ON	1 or 2	Misfire	C, R	×	
P0303	Cylinder No.3 misfire detected	Flash/ ON	1 or 2	Misfire	C, R	×	
P0304	Cylinder No.4 misfire detected	Flash/ ON	1 or 2	Misfire	C, R	×	
P0327	KS circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-134 DTC P0327[LF, L3].)
P0328	KS circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-137 DTC P0328[LF, L3].)
P0335	CKP sensor circuit problem	ON	1	CCM	C	×	(See 01-02A-139 DTC P0335[LF, L3].)
P0340	CMP sensor circuit problem	ON	1	CCM	C	×	(See 01-02A-141 DTC P0340[LF, L3].)
P0401	EGR flow insufficient detected	ON	2	EGR system	C, R	×	(See 01-02A-144 DTC P0401[LF, L3].)
P0403	EGR valve (stepper motor) circuit problem	ON	2	CCM	C, O, R	×	(See 01-02A-146 DTC P0403[LF, L3].)
P0421	Warm up catalyst system efficiency below threshold	ON	2	Catalyst	C	×	(See 01-02A-149 DTC P0421[LF, L3].)
P0441	Evaporative emission control system incorrect purge flow	ON	2	EVAP system	C, R	×	(See 01-02A-152 DTC P0441[LF, L3].)
P0442	Evaporative emission control system leak detected (small leak)	ON	2	EVAP system	C, R	×	(See 01-02A-154 DTC P0442[LF, L3].)
P0443	Purge solenoid valve circuit problem	ON	2	CCM	C, O, R	×	(See 01-02A-156 DTC P0443[LF, L3].)
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	ON	2	CCM	C, R	×	(See 01-02A-158 DTC P0446[LF, L3].)
P0455	Evaporative emission control system leak detected (gross leak)	ON	2	EVAP system	C, R	×	(See 01-02A-159 DTC P0455[LF, L3].)
P0456*2	Evaporative emission system leak detected (very small leak)	ON	2	EVAP system	C, R	×	(See01-02A-162 DTC P0456[LF, L3].)
P0461	Fuel gauge sender unit circuit range/ performance	ON	2	CCM	C	×	(See 01-02A-164 DTC P0461[LF, L3].)
P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	C, O, R	×	(See 01-02A-165 DTC P0462[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	C, O, R	×	(See 01-02A-166 DTC P0463[LF, L3].)
P0480	Fan control circuit problem	OFF	1	Other	C, O, R	×	(See 01-02A-167 DTC P0480[LF, L3].)
P0500	VSS circuit problem	ON	2	CCM	C	×	(See 01-02A-169 DTC P0500[LF, L3].)
P0505	IAC system problem	OFF	—	Other	R	—	(See 01-02A-172 DTC P0505[LF, L3].)
P0506	Idle control system RPM lower than expected	ON	2	CCM	C	×	(See 01-02A-173 DTC P0506[LF, L3].)
P0507	Idle control system RPM higher than expected	ON	2	CCM	C	×	(See 01-02A-174 DTC P0507[LF, L3].)
P050A	Cold start idle air control system performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See01-02A-175 DTC P050A[LF, L3].)
P050B	Cold start ignition timing performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See01-02A-176 DTC P050B[LF, L3].)
P0564	Cruise control switch circuit malfunction	OFF	1	Other	C	×	(See 01-02A-178 DTC P0564[LF, L3].)
P0571	Brake switch circuit problem	OFF	1	Other	C	×	(See 01-02A-179 DTC P0571[LF, L3].)
P0601	PCM memory check sum error	ON	1	CCM	C, O, R	×	(See 01-02A-182 DTC P0601[LF, L3].)
P0602	PCM programming error	ON	1	CCM	C, O, R	×	(See 01-02A-183 DTC P0602[LF, L3].)
P0604	PCM RAM error	ON	1	CCM	C, O, R	×	(See 01-02A-183 DTC P0604[LF, L3].)
P0606	ECM/PCM processor	ON	1	CCM	C, O, R	×	(See 01-02A-184 DTC P0606[LF, L3].)
P0607*3	PCM performance problem	OFF	1	Other	C, O, R	×	(See 01-02A-185 DTC P0607[LF, L3].)
P0610	PCM vehicle options error	ON	1	CCM	C, O, R	×	(See 01-02A-186 DTC P0610[LF, L3].)
P0638	Throttle actuator control range/ performance problem	ON	1	CCM	C	×	(See 01-02A-187 DTC P0638[LF, L3].)
P0661	Variable intake air solenoid valve circuit low input	OFF	1	Other	C, O, R	×	(See 01-02A-188 DTC P0661[LF, L3].)
P0662	Variable intake air solenoid valve circuit high input	OFF	1	Other	C, O, R	×	(See 01-02A-190 DTC P0662[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P0703	Brake switch input circuit problem	ON	2	CCM	C	×	(See 01-02A-192 DTC P0703[LF, L3].)
P0704*4	Clutch pedal position (CPP) switch input circuit problem	ON	2	CCM	C	×	(See 01-02A-194 DTC P0704[LF, L3].)
P0706*5	Transaxle range (TR) switch circuit range/performance	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0707*5	Transaxle range (TR) switch circuit low input	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0708*5	Transaxle range (TR) switch circuit high input	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0711*5	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0712*5	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0713*5	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0715*5	Input/turbine speed sensor circuit malfunction	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0720*5	VSS circuit malfunction	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0731*5	Gear 1 incorrect (incorrect gear ratio detected)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0732*5	Gear 2 incorrect (incorrect gear ratio detected)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0733*5	Gear 3 incorrect (incorrect gear ratio detected)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0734*5	Gear 4 incorrect (incorrect gear ratio detected)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0741*5	Torque converter clutch (TCC) (stuck off)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0742*5	Torque converter clutch (TCC) (stuck on)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0745*5	Pressure control solenoid malfunction	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0751*5	Shift solenoid A stuck off	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0752*5	Shift solenoid A stuck on	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0753*5	Shift solenoid A malfunction (electrical)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0756*5	Shift solenoid B stuck off	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0757*5	Shift solenoid B stuck on	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0758*5	Shift solenoid B malfunction (electrical)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0761*5	Shift solenoid C stuck off	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0762*5	Shift solenoid C stuck on	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0763*5	Shift solenoid C malfunction (electrical)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0766*5	Shift solenoid D stuck off	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0767*5	Shift solenoid D stuck on	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P0768*5	Shift solenoid D malfunction (electrical)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0771*5	Shift solenoid E stuck off	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0772*5	Shift solenoid E stuck on	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0773*5	Shift solenoid E malfunction (electrical)	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0850*4	Neutral switch input circuit problem	ON	2	CCM	C	×	(See 01-02A-197 DTC P0850[LF, L3].)
P0883*5	Battery voltage high	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P0894*5	Forward clutch torque transmission	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P1260	Immobilizer system problem	OFF	1	Other	C, O	×	(See 01-02A-199 DTC P1260[LF, L3].)
P1783*5	ATF high oil temperature malfunction	(See 05-02A-11 DTC TABLE[FN4A-EL].) (See 05-02B-9 DTC TABLE[FS5A-EL].)					
P2004	Variable tumble shutter valve stuck open	ON	2	CCM	C, R	×	(See 01-02A-200 DTC P2004[LF, L3].)
P2006	Variable tumble shutter valve stuck closed	ON	2	CCM	C, R	×	(See 01-02A-204 DTC P2006[LF, L3].)
P2009	Variable tumble solenoid valve circuit low input	ON	2	CCM	C, O, R	×	(See 01-02A-207 DTC P2009[LF, L3].)
P2010	Variable tumble solenoid valve circuit high input	ON	2	CCM	C, O, R	×	(See 01-02A-209 DTC P2010[LF, L3].)
P2088	Oil control valve (OCV) circuit low	ON	1	CCM	C, O, R	×	(See 01-02A-211 DTC P2088[LF, L3].)
P2089	Oil control valve (OCV) circuit high	ON	1	CCM	C, O, R	×	(See01-02A-213 DTC P2089[LF, L3].)
P2096	Target A/F feedback system too lean	ON	2	Fuel system	C	×	(See 01-02A-215 DTC P2096[LF, L3].)
P2097	Target A/F feedback system too rich	ON	2	Fuel system	C	×	(See 01-02A-220 DTC P2097[LF, L3].)
P2100*3	Throttle actuator circuit open	ON	1	CCM	C, O, R	×	(See 01-02A-224 DTC P2100[LF, L3].)
P2101	Throttle actuator circuit range/ performance	ON	1	CCM	C, R	×	(See 01-02A-226 DTC P2101[LF, L3].)
P2102*3	Throttle actuator circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-231 DTC P2102[LF, L3].)
P2103*3	Throttle actuator circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-233 DTC P2103[LF, L3].)
P2107	Throttle actuator control module processor error	ON	1	CCM	C, R	×	(See 01-02A-235 DTC P2107[LF, L3].)
P2108	Throttle actuator control module performance error	ON	1	CCM	C, R	×	(See 01-02A-236 DTC P2108[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P2109*2	TP sensor minimum stop range/ performance problem	ON	1	CCM	C, R	×	(See 01-02A-238 DTC P2109[LF, L3].)
P2112*2	Throttle actuator control system range/ performance problem	ON	1	CCM	C, R	×	(See 01-02A-239 DTC P2112[LF, L3].)
P2119	Throttle actuator control throttle body range/performance problem	ON	1	CCM	C, R	×	(See 01-02A-240 DTC P2119[LF, L3].)
P2122	Accelerator pedal position (APP) sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-241 DTC P2122[LF, L3].)
P2123	Accelerator pedal position (APP) sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-243 DTC P2123[LF, L3].)
P2126	Accelerator pedal position (APP) sensor No.2 circuit range/performance problem	ON	1	CCM	C, O, R	×	(See 01-02A-245 DTC P2126[LF, L3].)
P2127	Accelerator pedal position (APP) sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-246 DTC P2127[LF, L3].)
P2128	Accelerator pedal position (APP) sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-248 DTC P2128[LF, L3].)
P2135	Throttle position sensor No.1/No.2 voltage problem	ON	1	CCM	C, O, R	×	(See 01-02A-250 DTC P2135[LF, L3].)
P2138	Accelerator pedal position (APP) sensor No.1/No.2 voltage problem	ON	1	CCM	C, O, R	×	(See 01-02A-251 DTC P2138[LF, L3].)
P2177*3	Fuel system too lean at off idle	ON	2	Fuel system	C, R	×	(See 01-02A-252 DTC P2177[LF, L3].)
P2178*3	Fuel system too rich at off idle	ON	2	Fuel system	C, R	×	(See 01-02A-254 DTC P2178[LF, L3].)
P2187*3	Fuel system too lean at idle	ON	2	Fuel system	C, R	×	(See 01-02A-256 DTC P2187[LF, L3].)
P2188*3	Fuel system too rich at idle	ON	2	Fuel system	C, R	×	(See 01-02A-259 DTC P2188[LF, L3].)
P2195	Front HO2S signal stuck lean	ON	2	HO2S	C	×	(See 01-02A-261 DTC P2195[LF, L3].)
P2196	Front HO2S signal stuck rich	ON	2	HO2S	C	×	(See 01-02A-265 DTC P2196[LF, L3].)
P2228	BARO sensor circuit low input	ON	1	CCM	C, O, R	×	(See 01-02A-269 DTC P2228[LF, L3].)
P2229	BARO sensor circuit high input	ON	1	CCM	C, O, R	×	(See 01-02A-270 DTC P2229[LF, L3].)
P2237*3	Front HO2S positive current control circuit open	ON	2	HO2S	C, O, R	×	(See 01-02A-271 DTC P2237[LF, L3].)
P2251*3	Front HO2S negative current control circuit open	ON	2	HO2S	C, O, R	×	(See 01-02A-273 DTC P2251[LF, L3].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
P2270*2	Middle HO2S signal stuck lean	ON	2	HO2S	C	×	(See 01-02A-275 DTC P2270[LF, L3].)
P2271*2	Middle HO2S signal stuck rich	ON	2	HO2S	C	×	(See 01-02A-276 DTC P2271[LF, L3].)
P2274*2	Rear HO2S signal stuck lean	ON	2	HO2S	C	×	(See 01-02A-278 DTC P2274[LF, L3].)
P2275*2	Rear HO2S signal stuck rich	ON	2	HO2S	C	×	(See 01-02A-280 DTC P2275[LF, L3].)
P2401	EVAP system leak detection pump motor circuit low	ON	2	CCM	C, R	×	(See 01-02A-282 DTC P2401[LF, L3].)
P2402	EVAP system leak detection pump motor circuit high	ON	2	CCM	C, R	×	(See 01-02A-285 DTC P2402[LF, L3].)
P2404	EVAP system leak detection pump sense circuit problem	ON	2	CCM	C, R	×	(See 01-02A-287 DTC P2404[LF, L3].)
P2405	EVAP system leak detection pump sense circuit low input	ON	2	CCM	C, R	×	(See 01-02A-288 DTC P2405[LF, L3].)
P2407	EVAP system leak detection pump sense circuit intermittent	ON	2	CCM	C, R	×	(See 01-02A-289 DTC P2407[LF, L3].)
P2502	Charging system voltage problem	OFF	1	Other	C, R	×	(See 01-02A-290 DTC P2502[LF, L3].)
P2503	Charging system voltage low	OFF	1	Other	C, R	×	(See 01-02A-292 DTC P2503[LF, L3].)
P2504	Charging system voltage high	OFF	1	Other	C, R	×	(See 01-02A-294 DTC P2504[LF, L3].)
P2507	PCM B+ voltage low	ON	1	CCM	C, O, R	×	(See 01-02A-296 DTC P2507[LF, L3].)
P2610	PCM internal engine off timer performance	ON	2	CCM	C	×	(See 01-02A-298 DTC P2610[LF, L3].)
U0073	CAN system communication error	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0101*6	Communication error to PCM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0121	Communication error to ABS HU/CM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0155	Communication error to instrument cluster	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					

*1 : C: CMDTC self-test, O: KOEO self-test, R: KOER self-test
*2 : California emission regulation applicable model
*3 : Except for California emission regulation applicable model
*4 : MTX
*5 : ATX
*6 : L3 ATX

DTC B1342[LF, L3]

id0102a3815700

DTC B1342	PCM malfunction
DETECTION CONDITION	• Malfunction in the PCM internal circuit.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY CURRENT STATUS OF MALFUNCTION** • Clear the DTC from the PCM memory using the M-MDS. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
2	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0011[LF, L3]

id0102a3801600

DTC P0011	CMP Timing over-advanced
DETECTION CONDITION	**California emission regulation applicable model** • Actual valve timing is over-advanced by **10 ° (when the following conditions are met)** from target valve timing when the OCV is controlled in the maximum valve timing retard condition. **MONITORING CONDITION** — Engine coolant temperature is **above 20 °C {68 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • The actual valve timing is over-advanced by **15 ° (when the following conditions are met)** from the target valve timing when the OCV is controlled in the maximum valve timing retard condition. **Monitoring condition** — Engine speed is **below 4,000 rpm** — Engine coolant temperature is **70—110°C {158—230°F}** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in during first drive cycles. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Oil control valve (OCV) malfunction • Spool valve in OCV is stuck in advance position • Variable valve timing actuator is stuck in advance position • Loose timing chain or improper valve timing due to timing chain slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT OCV FOR MALFUNCTION** • Start the engine. • Increase the engine speed. • Stop the engine. • Remove the OCV. (See 01-10A-35 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[LF, L3].) • Inspect the position of the spool valve in the OCV. (See 01-10A-35 OIL CONTROL VALVE (OCV) INSPECTION[LF, L3].) • Is the spool valve located at the valve retard position?	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 6. (See 01-10A-35 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[LF, L3].)
4	**INSPECT STOPPER PIN MECHANISM** • Remove the timing chain. • Inspect the stopper pin. (See 01-10A-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3].) • Is the stopper pin mechanism normal?	Yes	Go to the next step.
		No	Replace variable valve timing actuator, then go to Step 6.
5	**INSPECT ROTOR POSITION** • Remove the variable valve timing actuator. • Is the rotor position at the maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of the variable valve timing control function. Go to the next step.
		No	Replace the variable valve timing actuator, go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0012[LF, L3]

id0102a3801700

DTC P0012	CMP Timing over-retarded
DETECTION CONDITION	**California emission regulation applicable model** • Actual valve timing is over-retarded by **10** ° (when the following conditions are met) from target valve timing for **5 s** when the OCV system control is within feed-back range. **MONITORING CONDITION** — Engine coolant temperature is **above 20 °C {68 °F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • Actual valve timing is over-retarded by **10°** from the target valve timing for **5 s** when the OCV system control is within the feed-back range. **Monitoring condition** — Engine speed is **below 4,000 rpm** — Engine coolant temperature is **70—110°C {158—230°F}** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Oil control valve (OCV) malfunction • Low engine oil pressure • Spool valve in the OCV is stuck in retard position. • Variable valve timing actuator is stuck in retard position. • Following oil runners are clogged or have leakage. **Oil runners** — Between the oil pressure switch and the OCV — Between the OCV and the variable valve timing actuator — In variable valve timing actuator • Loose timing chain or improper valve timing due to the timing chain slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Is DTC P2088 or P2089 present?	Yes	Go to the appropriate DTC troubleshooting procedure. (See 01-02A-211 DTC P2088[LF, L3] or 01-02A-213 DTC P2089[LF, L3].)
		No	Go to the next step.
4	**VERIFY ENGINE OIL PRESSURE** • Start the engine. • Does the oil pressure warning light illuminate?	Yes	Inspect the engine oil pressure, then go to Step 8. (See 01-11A-3 OIL PRESSURE INSPECTION[LF, L3].)
		No	Go to the next step.
5	**VERIFY TIMING CHAIN INSTALLATION** • Stop the engine. • Remove the timing chain cover. • Is the camshaft timing mark at correct point? (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)	Yes	Go to the next step.
		No	Reinstall the timing chain, then go to Step 8.
6	**INSPECT OCV FOR MALFUNCTION** • Stop the engine. • Remove the OCV. • Inspect the position of the spool valve in the OCV. • Is the spool valve located at the valve retard position?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of the variable valve timing control function. Go to the next step.
		No	Replace the OCV, then go to Step 8.
7	**INSPECT ENGINE OIL RUNNER** • Inspect the following engine oil runners for clogging or leakage. — Between oil pressure switch and OCV — Between OCV and variable valve timing actuator — In variable valve timing actuator • Is there any clogging or leakage?	Yes	Repair or replace the suspected runner, then go to the next step.
		No	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected by intermittent concern. • Intermittent concern might be removed by cleaning mode of the variable valve timing control function. Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0016[LF, L3]

id0102a3801800

DTC P0016	CKP-CMP correlation
DETECTION CONDITION	• The PCM monitors the input pulses from the CKP sensor and CMP sensor. If the input pulse pick-up timing do not match each other, the PCM determines that the camshaft position does not coincide with the crankshaft position. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connector • CMP sensor malfunction • CKP sensor malfunction • Damaged or scratched CMP sensor pulse wheel • Damaged or scratched CKP sensor pulse wheel • Foreign material on CMP sensor • Foreign material on CKP sensor • Improper valve timing

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CMP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	**INSPECT CMP SENSOR FOR FOREIGN MATERIAL** • Remove the CMP sensor. • Inspect the CMP sensor for foreign materials. • Is there any foreign material on the CMP sensor?	Yes	Remove foreign material from the CMP sensor, then go to Step 13.
		No	Go to the next step.
5	**INSPECT CMP SENSOR PULSE WHEEL** • Visually inspect the CMP sensor pulse wheel. • Are there any damage or scratches at the CMP sensor pulse wheel?	Yes	Replace the camshaft, then go to Step 13. (See 01-10A-20 CYLINDER HEAD GASKET REPLACEMENT[LF, L3].)
		No	Go to the next step.
6	**INSPECT CMP SENSOR** • Inspect the CMP sensor. (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].) • Is the CMP sensor normal?	Yes	Go to the next step.
		No	Replace the CMP, then go to Step 13.
7	**INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CKP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.

STEP	INSPECTION		ACTION
8	**INSPECT CKP SENSOR FOR FOREIGN MATERIAL** • Remove the CKP sensor. • Inspect the CKP sensor for foreign material. • Is there any foreign material on the CKP sensor?	Yes	Remove foreign material from the CKP sensor, then go to Step 13.
		No	Go to the next step.
9	**INSPECT CKP SENSOR PULSE WHEEL** • Visually inspect the CKP sensor pulse wheel. • Are there any damage or scratches on the CKP sensor pulse wheel?	Yes	Replace the CKP sensor pulse wheel, then go to Step 13. (See 01-10A-12 TIMING CHAIN REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT CKP SENSOR** • Inspect the CKP sensor. (See 01-40A-68 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3].) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 13. (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[LF, L3].)
11	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
12	**INSPECT VALVE TIMING** • Inspect valve timing. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].) • Is valve timing normal?	Yes	Go to the next step.
		No	Adjust the valve timing properly, then go to the next step. (See 01-10A-12 TIMING CHAIN REMOVAL/ INSTALLATION[LF, L3].)
13	**VERIFY TROUBLESHOOTING OF DTC P0016 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and run it at the idle. • Retrieve the DTC using the M-MDS. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0030[LF, L3]

id0102a3801900

California Emission Regulation Applicable Model

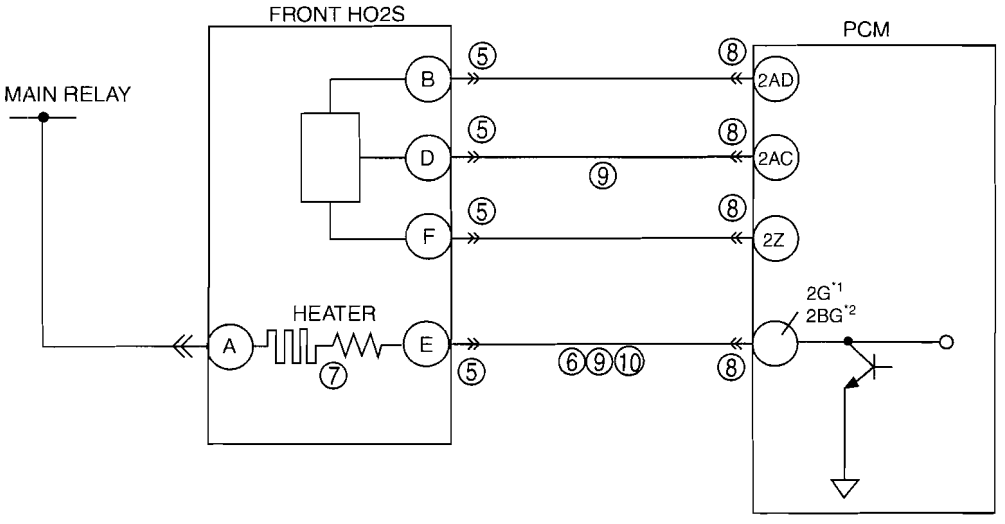
DTC P0030	Front HO2S heater control circuit problem
DETECTION CONDITION	• The PCM monitors the front HO2S impedance when under the front HO2S heater control for **200 s**. If the impedance is **more than 44 ohms**, the PCM determines that there is a front HO2S heater control circuit problem. **Diagnostic support note** • This is an intermittent monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

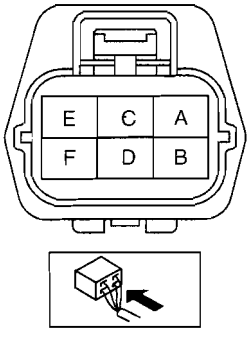
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 7. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0030 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0030	Front HO2S heater control circuit problem
DETECTION CONDITION	• OBD system monitors the output signal voltage from oxygen sensor which is proportion to the element impedance of oxygen sensor. • If the output signal voltage isn't between **0.75 V** and **1.5 V** after specified time from engine start, heater performance considered failed. **MONITORING CONDITIONS** — Battery voltage: **10—18 V** — Time from engine start is **74 s or more** **Diagnostic support note** • This is an intermittent monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Short to ground in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • Short to power supply in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • Open circuit in wiring harness between front HO2S terminal D and PCM terminal 2AC • Open circuit in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • PCM malfunction

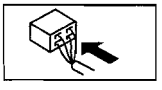


FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available Service information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using the M-MDS. • Is the DTC P0031 or P0032 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0030 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
6	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Front HO2S connector disconnected. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there continuity?	Yes	Repair or replace for short to ground, then go to Step 11.
		No	Go to the next step.
7	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 11. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step11.
		No	Go to the next step.
9	**INSPECT FRONT HO2S CIRCUIT FOR OPEN** • Front HO2S and PCM connectors disconnected. • Measure the continuity following circuit at wiring harness-side terminal. — Between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 — Between front HO2S terminal D and PCM terminal 2AC • Are there continuity?	Yes	Go to the next step.
		No	Repair or replace for open, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER** • Front HO2S and PCM connectors disconnected. • Measure the voltage between front HO2S sensor terminal E (wiring harness-side) and ground? • Is the voltage greater than **1.5V**	Yes	Repair or replace for short to power, then go to the next step.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0030 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0030 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

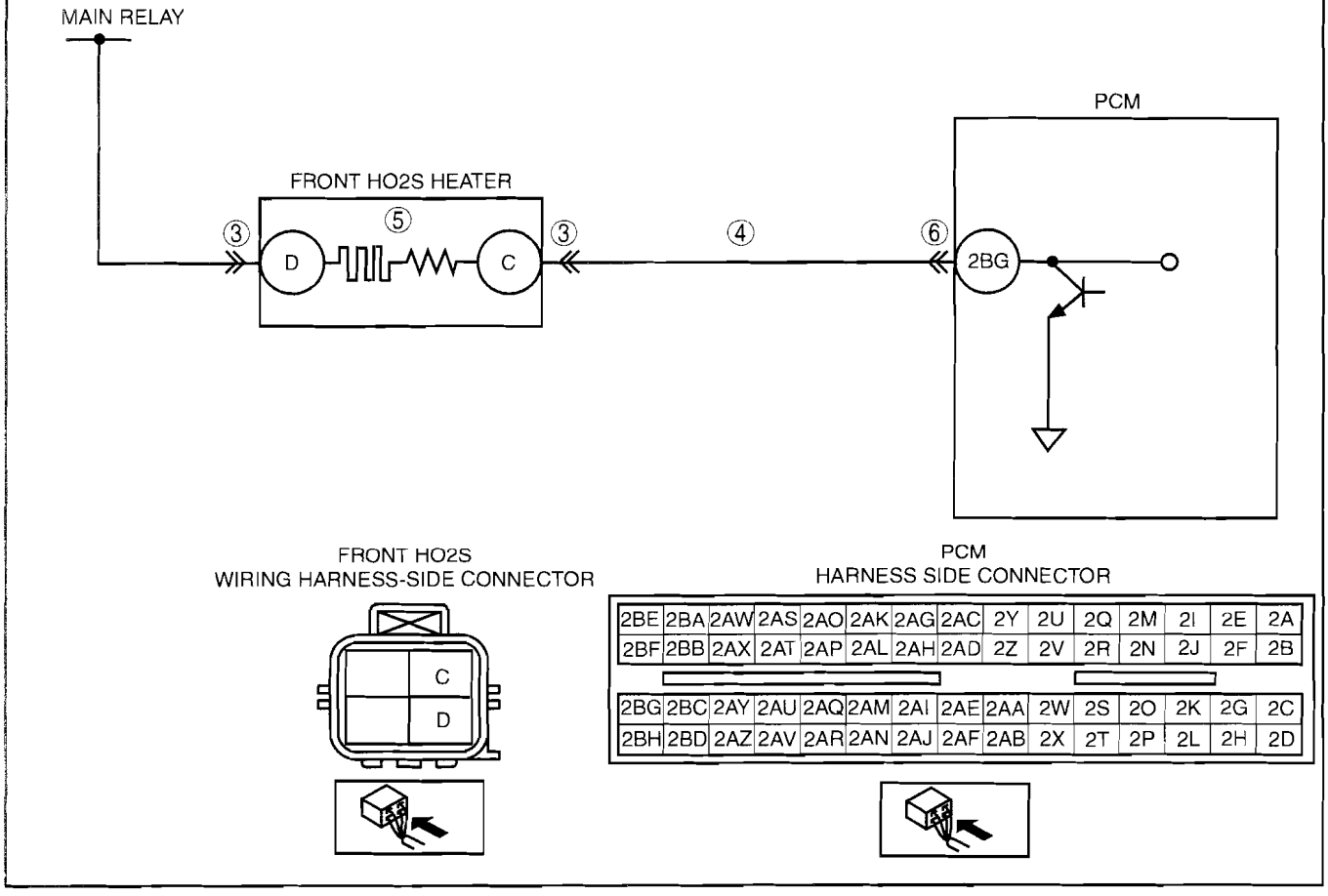
*1 : LF ATX
*2 : LF MTX, L3

DTC P0031[LF, L3]

id0102a3802000

California Emission Regulation Applicable Model

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater off. If the control voltage **exceeds 50%** of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal C and PCM terminal 2BG • PCM malfunction



Diagnostic procedure

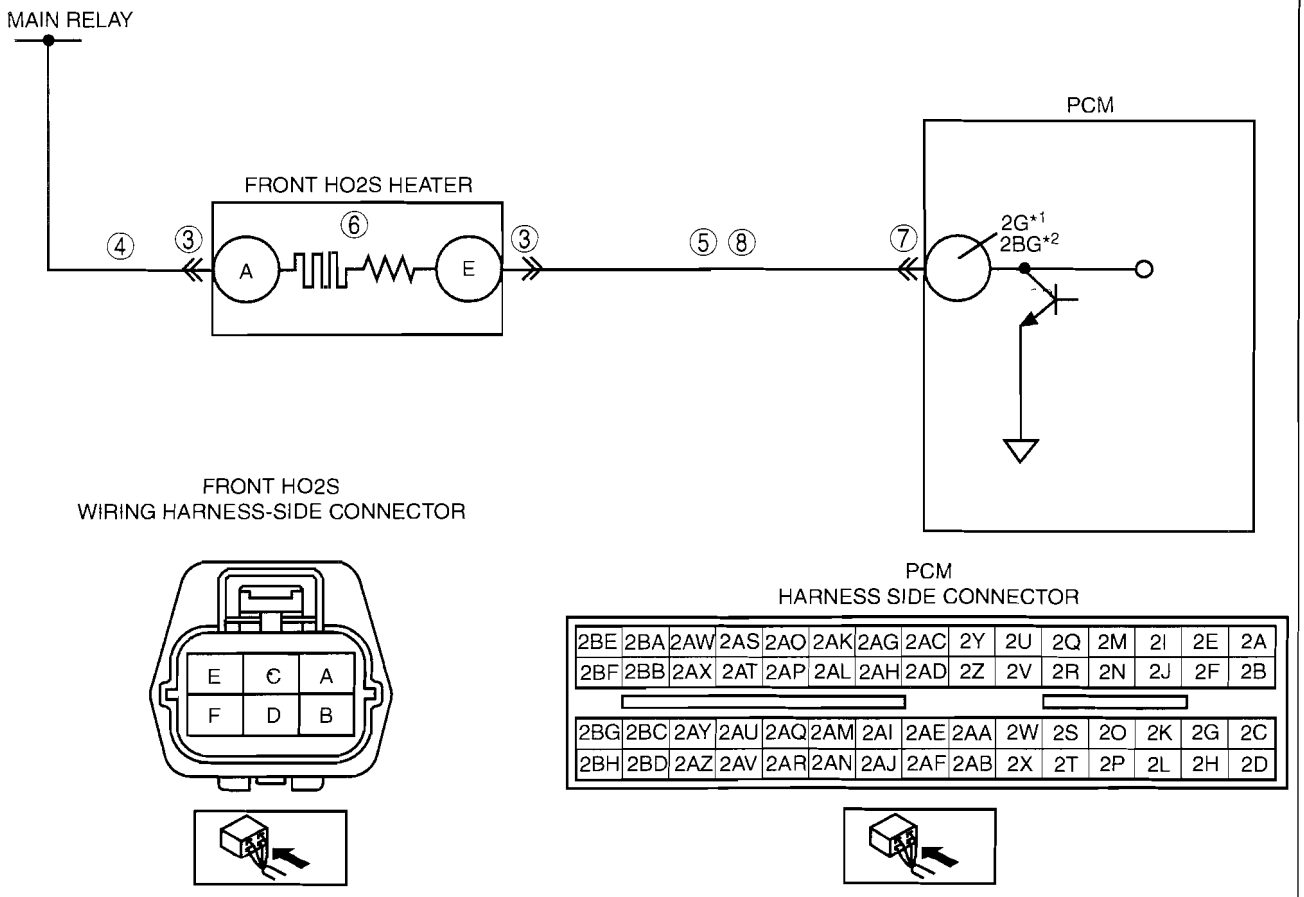
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 7. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the front HO2S heater output voltage. if the PCM turns the front HO2S heater off or on but the front HO2S heater circuit remains low voltage, the PCM determines that the front HO2S heater circuit has a malfunction. **Note** • The front HO2S heater is controlled by duty signal. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

DTC P0031	Front HO2S heater circuit low input
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay and front HO2S terminal A • Short to ground in wiring harness between main relay and front HO2S terminal A • Open circuit in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • Short to ground in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • PCM malfunction



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** - Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT FRONT HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal E (wiring harness-side) and PCM terminal 2G*1, 2BG*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0031 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

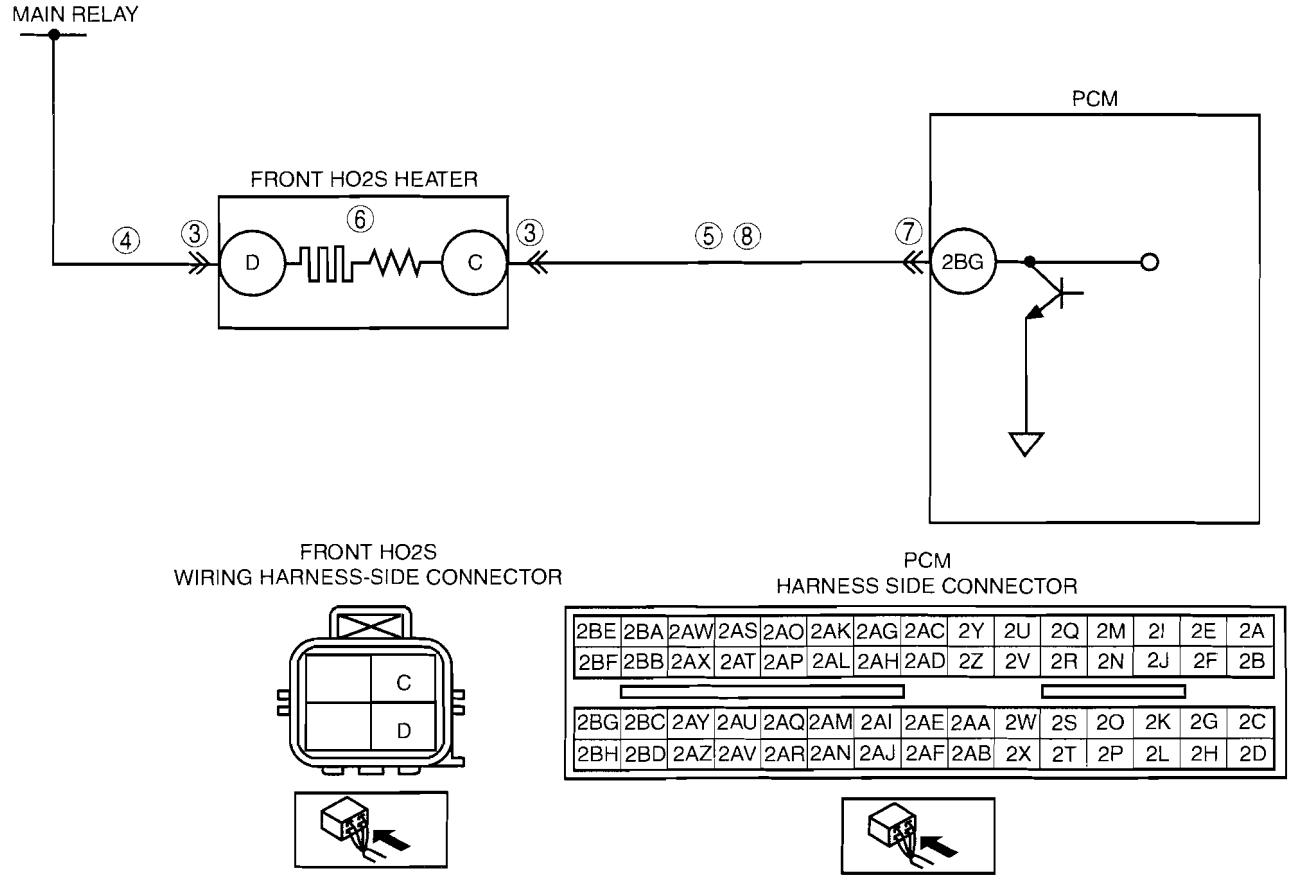
*1 : LF ATX
*2 : LF MTX, L3

DTC P0032[LF, L3]

id0102a3802100

California Emission Regulation Applicable Model

DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater on. If the control voltage is **less than 50%** of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay and front HO2S terminal D • Short to ground in wiring harness between main relay and front HO2S terminal D • Open circuit in wiring harness between front HO2S terminal C and PCM terminal 2BG • Short to ground in wiring harness between front HO2S terminal C and PCM terminal 2BG • PCM malfunction



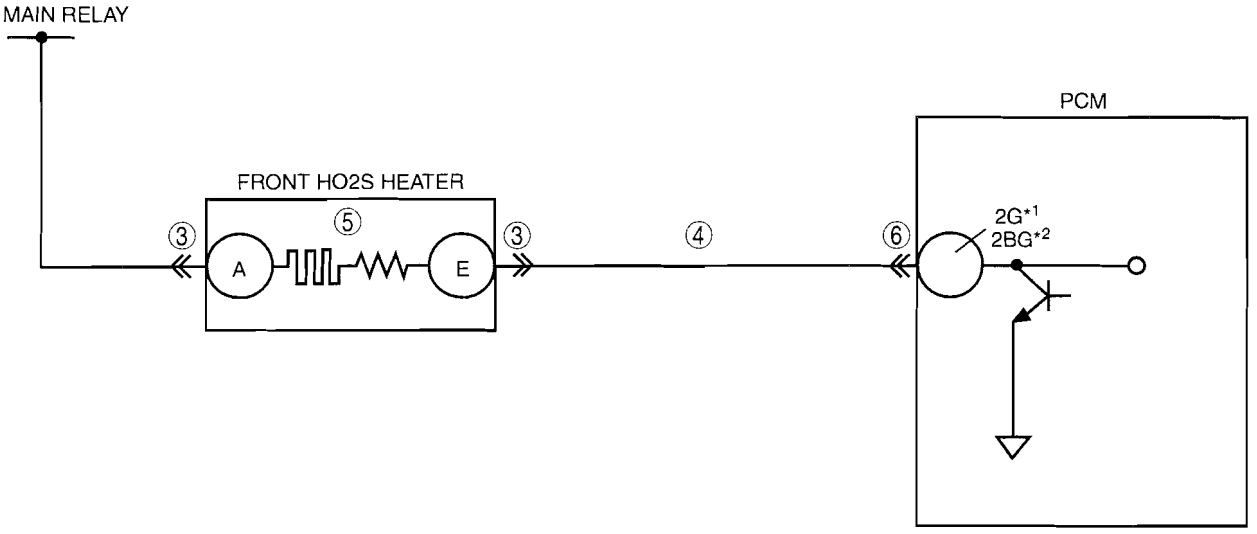
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

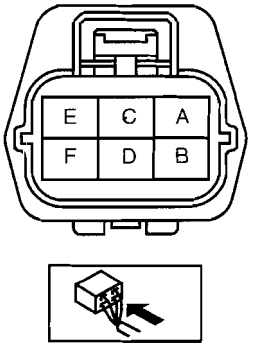
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT FRONT HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO ground** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal C (wiring harness-side) and PCM terminal 2BG (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the front HO2S heater output voltage. if the PCM turns the front HO2S heater off or on but the front HO2S heater circuit remains high voltage, the PCM determines that the front HO2S heater circuit has a malfunction. **Note** • The front HO2S heater is controlled by duty signal. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • PCM malfunction



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

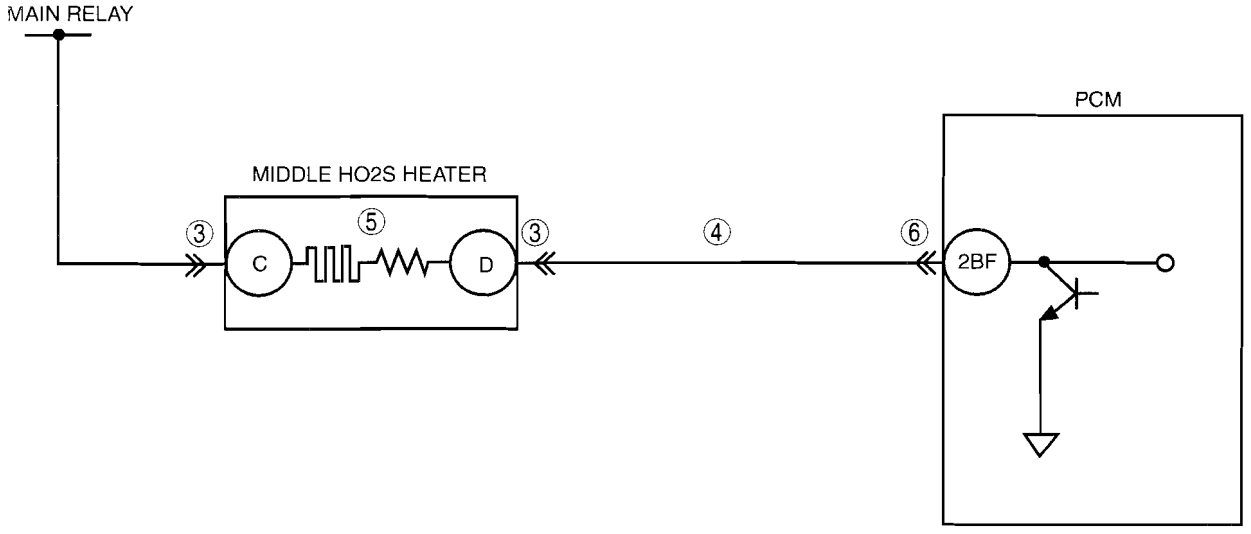
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal E (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 7. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0032 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0037[LF, L3]

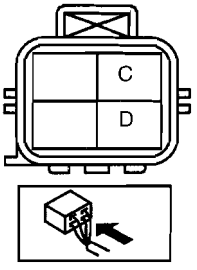
id0102a3802200

California Emission Regulation Applicable Model

DTC P0037	Middle HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the middle HO2S heater control voltage when the PCM turns the middle HO2S heater off. If the control voltage **exceeds 25%** of the battery voltage, the PCM determines that the middle HO2S heater control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Middle HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between middle HO2S terminal D and PCM terminal 2BF • PCM malfunction



MIDDLE HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

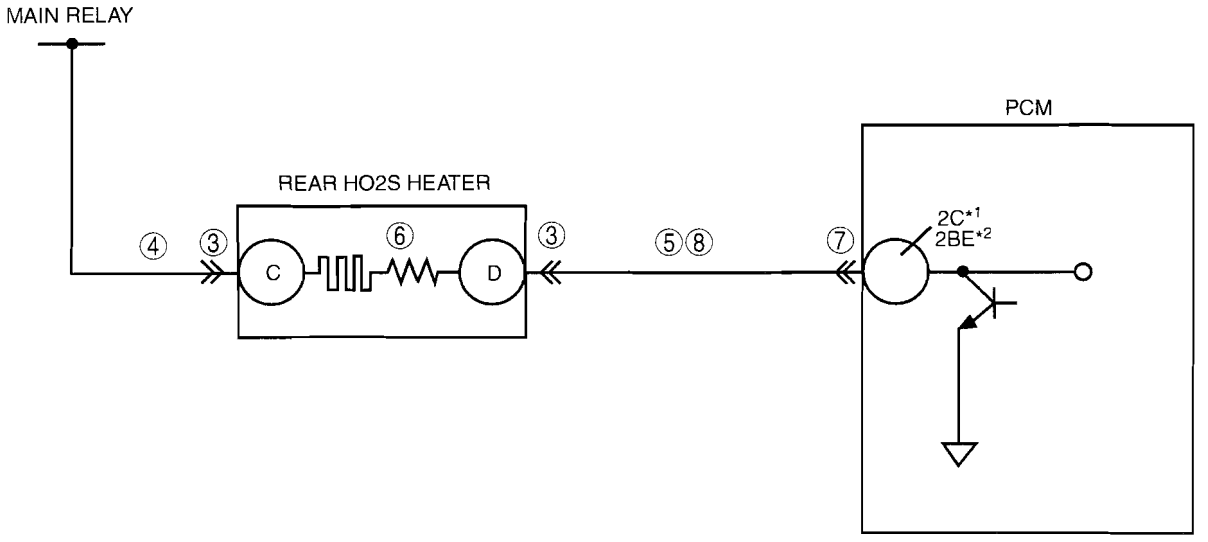
2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

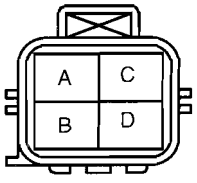
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MIDDLE HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the middle HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT MIDDLE HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT MIDDLE HO2S HEATER** • Inspect the middle HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the middle HO2S, then go to Step 7. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

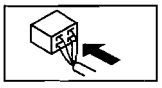
Except for California Emission Regulation Applicable Model

DTC P0037	Rear HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater output voltage. if the PCM turns the rear HO2S heater off or on but the rear HO2S heater circuit remains low voltage, the PCM determines that the rear HO2S heater circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay and rear HO2S terminal C • Short to ground in wiring harness between main relay and rear HO2S terminal C • Open circuit in wiring harness between rear HO2S terminal D and PCM terminal 2C*1, 2BE*2 • Short to ground in wiring harness between rear HO2S terminal D and PCM terminal 2C*1, 2BE*2 • PCM malfunction



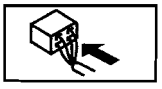
REAR HO2S WIRING HARNESS-SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 9. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and PCM terminal 2C*1, 2BE*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0037 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

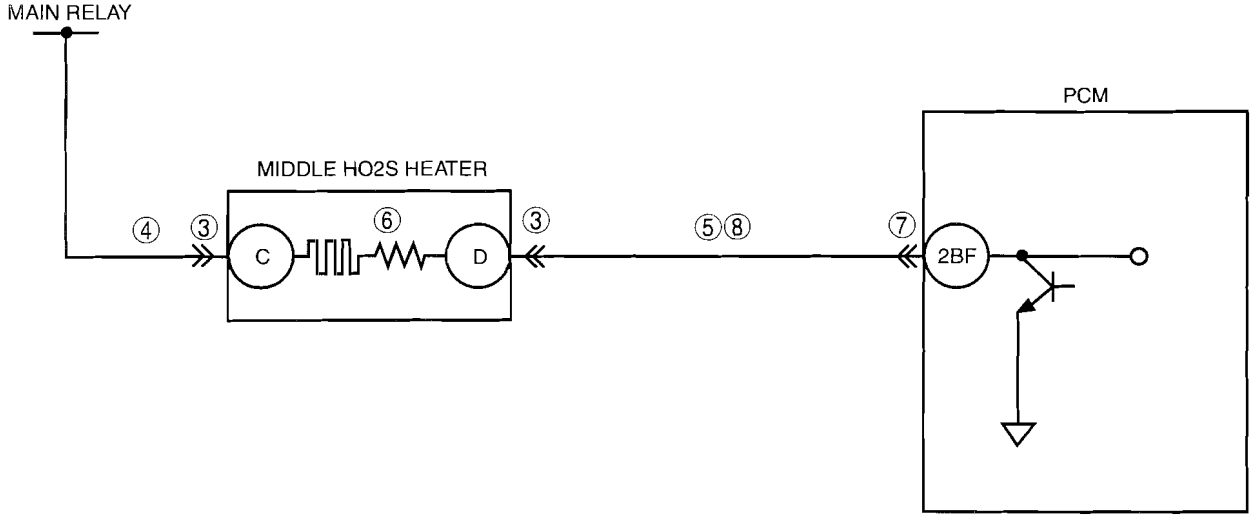
*1 : LF ATX
*2 : LF MTX, L3

DTC P0038[LF, L3]

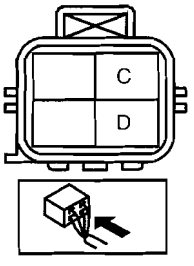
id0102a3802300

California Emission Regulation Applicable Model

DTC P0038	Middle HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the middle HO2S heater control voltage when the PCM turns the middle HO2S heater on. If the control voltage is **less than 57%** of the battery voltage, the PCM determines that the middle HO2S heater control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Middle HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay and middle HO2S terminal C • Short to ground in wiring harness between main relay and middle HO2S terminal C • Open circuit in wiring harness between middle HO2S terminal D and PCM terminal 2BF • Short to ground in wiring harness between middle HO2S terminal D and PCM terminal 2BF • PCM malfunction

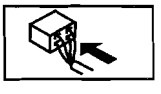


MIDDLE HO2S WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



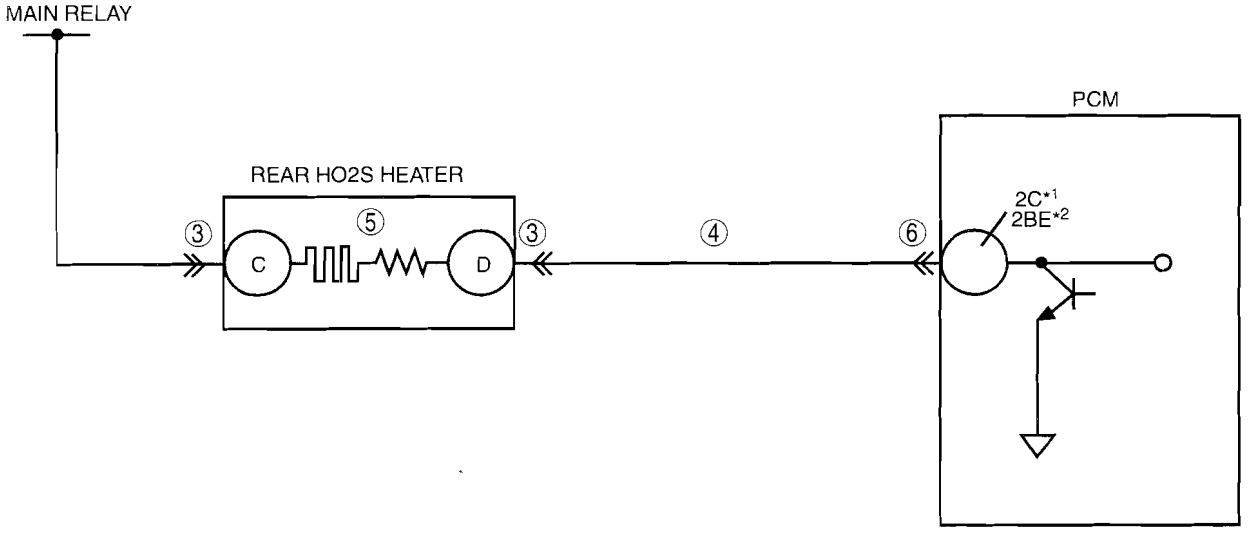
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

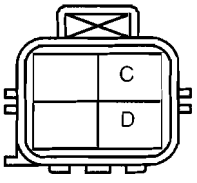
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MIDDLE HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the middle HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT MIDDLE HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between middle HO2S terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT MIDDLE HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between middle HO2S terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT MIDDLE HO2S HEATER** • Inspect the rear HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the middle HO2S, then go to Step 9. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT MIDDLE HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between middle HO2S terminal D (wiring harness-side) and PCM terminal 2BF (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

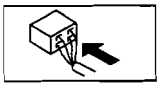
Except for California Emission Regulation Applicable Model

DTC P0038	Rear HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater output voltage. if the PCM turns the rear HO2S heater off or on but the rear HO2S heater circuit remains high voltage, the PCM determines that the rear HO2S heater circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between rear HO2S terminal D and PCM terminal 2C*1, 2BE*2 • PCM malfunction



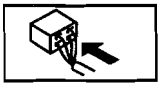
REAR HO2S
WIRING HARNESS-SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

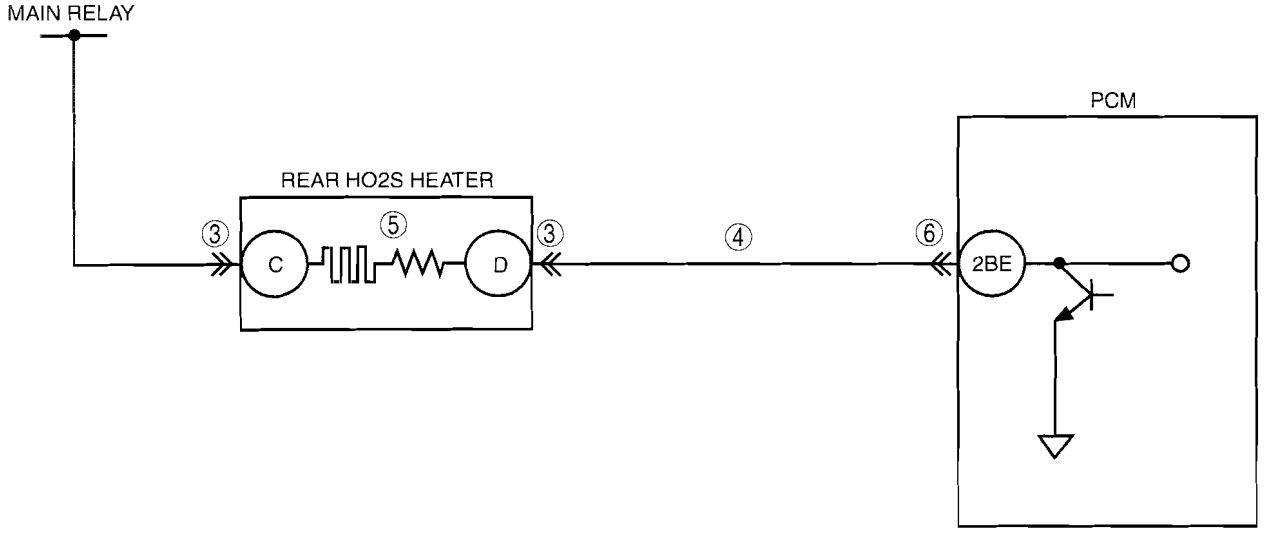
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 7. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0038 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0043[LF, L3]

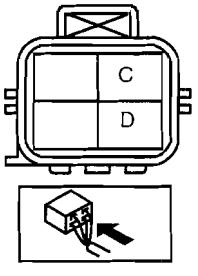
id0102a3828500

California Emission Regulation Applicable Model

DTC P0043	Rear HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater off. If the control voltage **exceeds 25%** of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between rear HO2S terminal D and PCM terminal 2BE • PCM malfunction

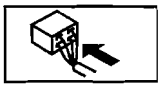


REAR HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

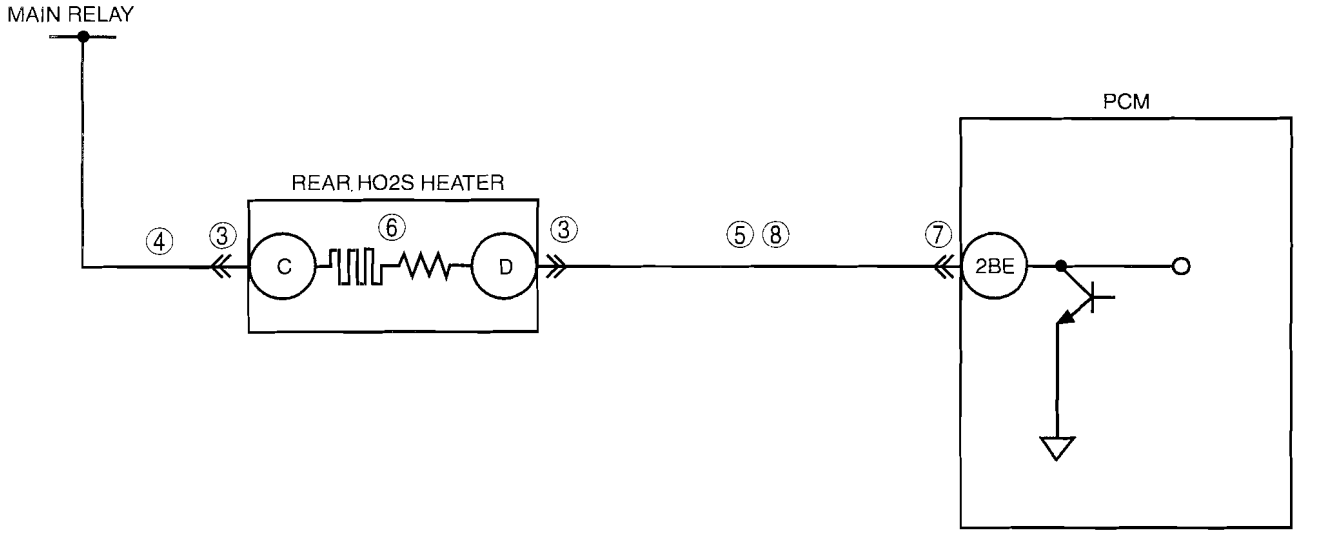
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 7. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0043 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0044[LF, L3]

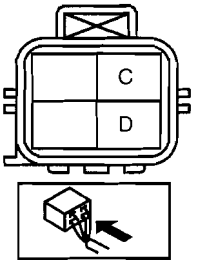
id0102a3828600

California Emission Regulation Applicable Model

DTC P0044	Rear HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater on. If the control voltage is **less than 57%** of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between main relay and rear HO2S terminal C • Short to ground in wiring harness between main relay and rear HO2S terminal C • Open circuit in wiring harness between rear HO2S terminal D and PCM terminal 2BE • Short to ground in wiring harness between rear HO2S terminal D and PCM terminal 2BE • PCM malfunction

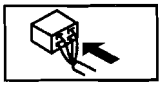


REAR HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 9. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and PCM terminal 2BE (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0044 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0069[LF, L3]

id0102a3802400

DTC P0069	Manifold absolute pressure/atmospheric pressure correlation
DETECTION CONDITION	• PCM monitors differences between intake manifold vacuum and atmospheric pressure. If the difference is **below –12 kPa {–90 mmHg, –3.5 inHg}** or **above 12 kPa {90 mmHg, 3.5 inHg}** when the following conditions are met, the PCM determines that there is a MAP sensor performance problem. **MONITORING CONDITION** — **12—15 s** from when ignition switch is turned off. — Intake air temperature is **above -10°C {14°F}**. — Engine coolant temperature is **above 70°C {158°F}**. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • BARO sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY STORED DTC** • Turn the ignition switch to off then start the engine. • Have DTC P0107, P0108, P2228 or P2229 been stored?	Yes	Inspect and repair DTC P0107, P0108, P2228 or P2229.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0069 on the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA.
5	**INSPECT MAP SENSOR STUCK OPEN OR CLOSED** • Inspect MAP sensor. (See 01-40A-53 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[LF, L3].) • Is the MAP sensor normal?	Yes	Go to the next step.
		No	Replace the MAP sensor, then go to step 7. (See 01-40A-53 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
6	**INSPECT BARO SENSOR** • Inspect the BARO sensor. (See 01-40A-72 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[LF, L3].) • Is the BARO sensor normal?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [LF, L3].)
7	**VERIFY TROUBLESHOOTING OF DTC P0069 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0101[LF, L3]

id0102a3803100

DTC P0101	MAF circuit range/performance problem
DETECTION CONDITION	• The PCM monitors mass intake air flow amount when the engine is running. — If mass intake air flow amount is **above 50 l/s (L3), above 42 l/s (LF)** for **5 s** and engine speed is **below 2,000 rpm** with engine running, PCM determines that detected mass intake air flow amount is too high. — If mass intake air flow amount is **below 6.0—57.8 l/s(L3) below 5.5—49.6 l/s (LF)** (The value depends on engine speed.) for **5 s** and engine speed is **above 1,000 rpm** with engine running and throttle opening angle is **above 50%**, PCM determines that detected mass intake air flow amount is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Electrical corrosion in MAF RETURN circuit • Voltage drops in ground circuit

Diagnostic procedure

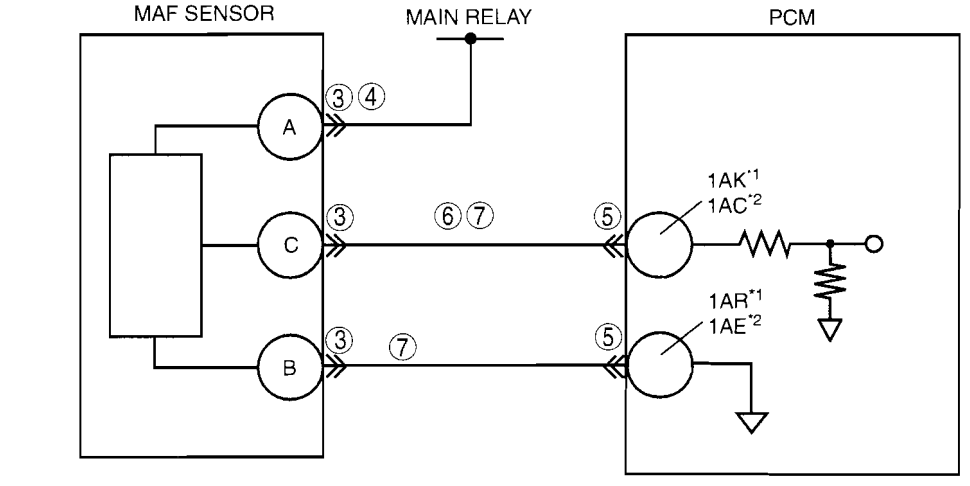
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect M-MDS to DLC-2. • Start the engine. • Access ECT, MAF, TP and RPM PIDs using M-MDS. • Warm-up engine until ECT PID is **above 70°C {158°F}**. • Idle engine for **5 s or more**. **Caution** • **While driving, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID: **50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear (MTX), D range (ATX) **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — Gear in • Is PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3])

STEP	INSPECTION		ACTION
4	**CHECK MAF SENSOR TERMINALS FOR ELECTRICAL CORROSION** • Turn ignition switch to OFF. • Disconnect MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is any problem corrosion found?	Yes	Repair or replace suspected terminal or MAF sensor, then go to Step 6.
		No	Go to next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to connect all disconnected connectors. • Turn ignition switch to ON (Engine OFF). • Clear DTC from PCM memory using M-MDS. • Start the engine. • Warm-up engine until ECT PID is **above 70°C {158°F}**. • Idle engine for **5 s or more**. **Caution** • **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID: **50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear (MTX), D range (ATX) **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — Gear in • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3]) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3])
		No	Troubleshooting completed.

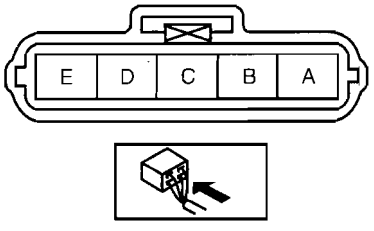
DTC P0102[LF, L3]

id0102a3803200

DTC P0102	MAF sensor circuit low input
DETECTION CONDITION	• The PCM monitors input voltage from the MAF sensor when the engine running. If the input voltage is **below 0.21 V**, the PCM determines that the MAF circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK*1, 1AC*2 • Open circuit in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK*1, 1AC*2 • Open circuit in wiring harness between main relay and MAF/IAT sensor terminal A • PCM malfunction



MAF/IAT SENSOR WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

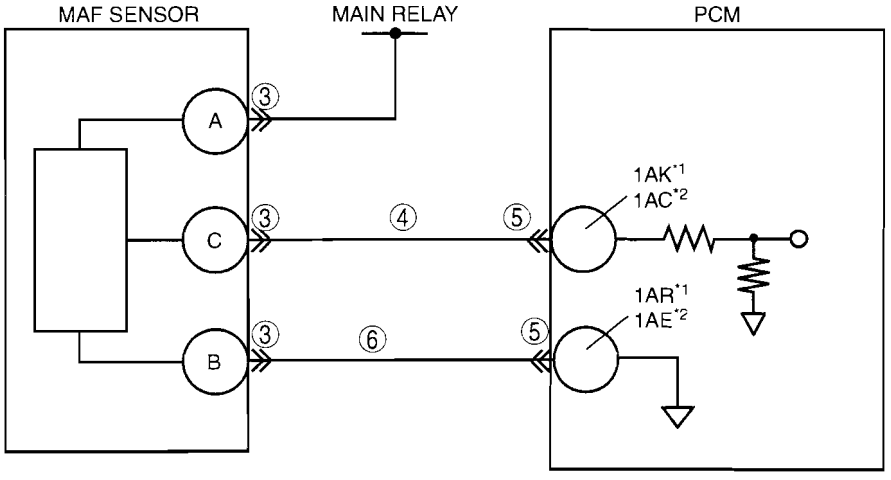
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 8.
		No	Go to the next step.
4	**INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position. (Engine off) • Inspect voltage at the MAF/IAT sensor terminal A (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect for open circuit in wiring harness between MAF/IAT sensor terminal B (wiring harness-side) and main relay. Repair or replace wiring harness, then go to Step 8.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair the terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Remove the PCM with the PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal C (wiring harness-side) and PCM terminal 1AK*1, 1AC*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 8.
7	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORTS** • Inspect for continuity between following terminals: — MAF/IAT sensor terminal C (wiring harness-side) and body ground — MAF/IAT sensor connector terminal C (wiring harness-side) and B (wiring harness-side) • Is there continuity?	Yes	Repair or the wiring harness, then go to the next step.
		No	Replace the MAF/IAT sensor, then go to the next step. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
8	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

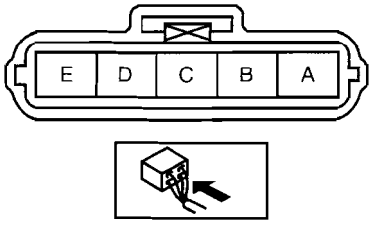
DTC P0103[LF, L3]

id0102a3803300

DTC P0103	MAF sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAF sensor when the engine running. If the input voltage is **above 4.9 V**, the PCM determines that the MAF circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK*1, 1AC*2 • Open circuit in wiring harness between MAF/IAT sensor terminal B and PCM terminal 1AR*1, 1AE*2 • PCM malfunction



MAF/IAT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

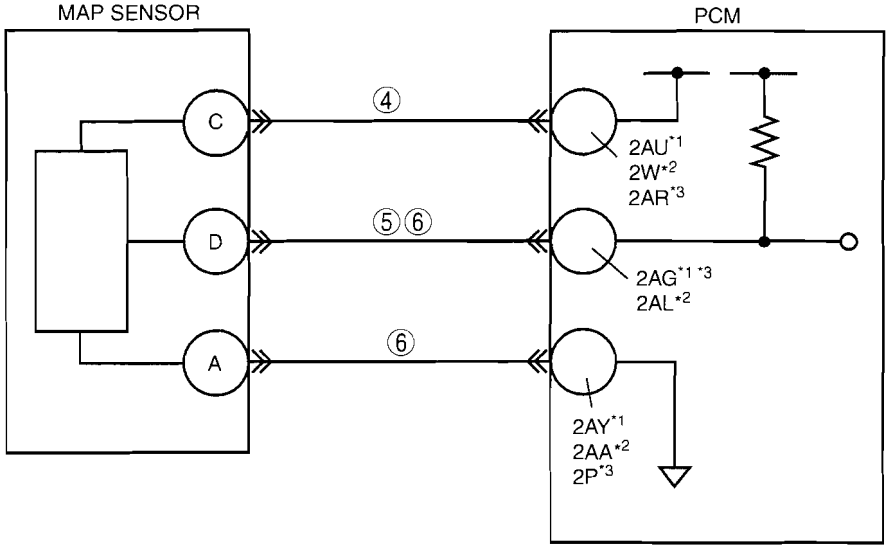
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 7.
		No	Go to the next step.
4	**INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER CIRCUIT** • Turn the ignition switch to the ON position. (Engine off) • Measure the voltage between MAF/IAT sensor terminal C (wiring harness-side) and body ground. • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 7.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MAF SENSOR GROUND FOR OPEN CIRCUIT** • Remove the PCM with the PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal B (wiring harness-side) and ground. • Is there continuity?	Yes	Replace MAF/IAT sensor, then go to the next step. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Repair or replace the wiring harness, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

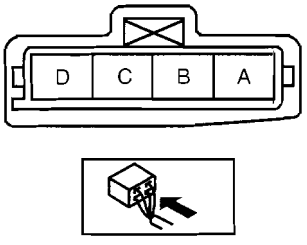
DTC P0107[LF, L3]

id0102a3803400

DTC P0107	MAP sensor circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAP sensor when the intake air temperature is **above -10 °C {14 °F}**. If the input voltage is below 0.1V, the PCM determines that the MAP sensor circuit has a malfunction. **MONITORING CONDITIONS** — Calculated load: **13—32 %** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between MAP sensor terminal D and PCM terminal 2AG*1 *3, 2AL*2 • MAP sensor signal circuit and MAP sensor ground circuit are shorted each other • PCM malfunction



MAP SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

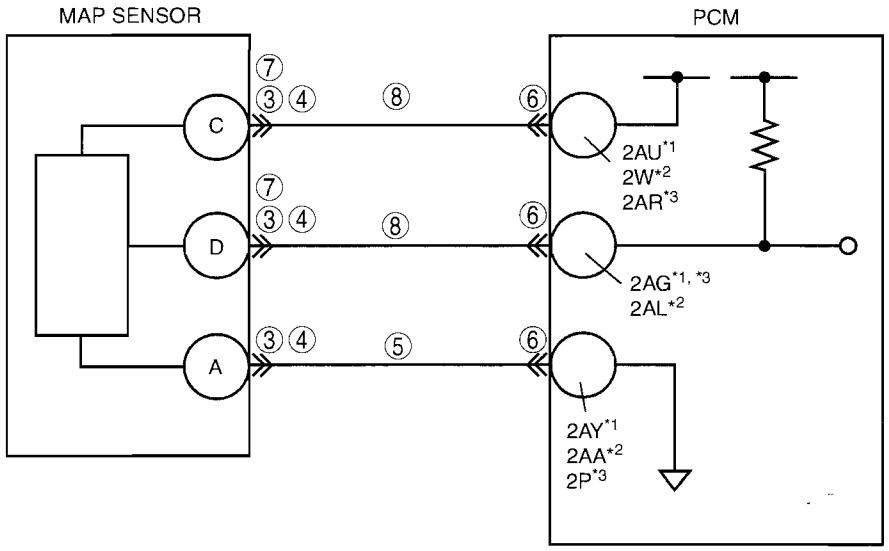
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY MAP PID WHEN MAP SENSOR CONNECTOR IS DISCONNECTED** • Connect the M-MDS to DLC-2. • Access MAP PID. • Disconnect the MAP sensor connector. • Is the voltage **above 4.9 V**?	Yes	Go to the next step.
		No	Go to Step 5.
4	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT MAP SENSOR CONNECTOR** **Note** • If DTC P0122 and P2228 are also retrieved with P0107, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between MAP sensor terminal C (wiring harness-side) and body ground. • Is the voltage **within 4.5—5.5 V?**	Yes	Inspect for poor connection at MAP sensor terminal C (wiring harness-side). • Repair or replace the terminal if necessary. • If there is no malfunction, replace the MAP sensor. Then go to Step 7.
		No	Inspect for open circuit in wiring harness between PCM terminal 2AU*1, 2W*2, 2AR*3 (wiring harness-side) and MAP sensor terminal C (wiring harness-side). Repair or replace suspected wiring harness, then go to Step 7.
5	**INSPECT MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for continuity between MAP sensor terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MAP SENSOR SIGNAL AND GROUND CIRCUIT FOR SHORT EACH OTHER** • Inspect for continuity between MAP sensor terminals D and A (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

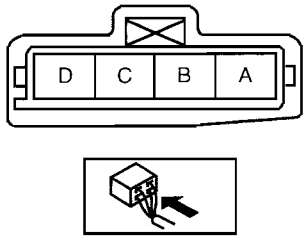
DTC P0108[LF, L3]

id0102a3803500

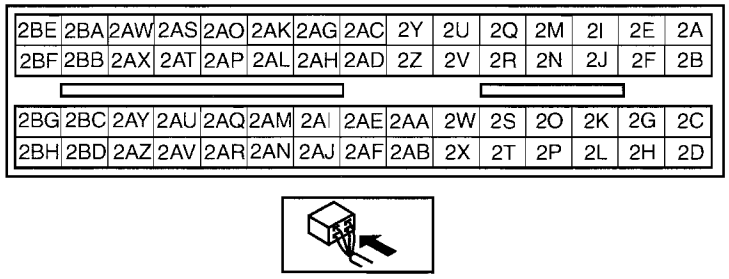
DTC P0108	MAP sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the MAP sensor when the intake air temperature is **above -10 °C {14 °F}**. If input the voltage is above 4.92 V, the PCM determines that the MAP sensor circuit has malfunction. **MONITORING CONDITIONS** — Calculated load: **13—32 %** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between MAP sensor terminal A and PCM terminal 2AY*1, 2AA*2, 2P*3 • Open circuit in wiring harness between MAP sensor terminal D and PCM terminal 2AG*1, *3, 2AL*2 • MAP sensor signal circuit shorts to constant voltage supply circuit • PCM malfunction



MAP SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT CONNECTION OF MAP SENSOR CONNECTOR** • Turn the ignition switch off. • Verify that the MAP sensor connector is connected securely. • Is connection normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 9.
4	**INSPECT POOR CONNECTION OF MAP SENSOR CONNECTOR** • Disconnect the MAP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
5	**VERIFY MAP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the MAP sensor terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Inspect for open circuit in wiring harness between PCM terminal 2AY*1, 2AA*2, 2P*3 (wiring harness-side) and MAP sensor terminal A (wiring harness-side). Repair or replace suspected harness, then go to Step 9.
6	**INSPECT PCM CONNECTOR** • Disconnect the PCM connector. • Inspect for poor connection at terminals (such as damaged/pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect for continuity between MAP sensor terminal D and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 9.
		No	Go to the next step.
8	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following: — MAP sensor terminal D (wiring harness-side) and PCM terminal 2AG*1*3, 2AL*2 (wiring harness-side) — MAP sensor terminal C (wiring harness-side) and PCM terminal 2AU*1, 2W*2, 2AR*3 (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

DTC P0111[LF, L3]

id0102a3803600

DTC P0111	IAT circuit range/performance problem
DETECTION CONDITION	• If intake air temperature is higher than engine coolant temperature by **18 °C {32.4 °F} for 1.2 s** with ignition switch on*, the PCM determines that there is a intake air temperature sensor circuit range/performance problem. *: Ignition switch on when **6 h** or more has passed since the previous ignition switch off **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at MAF/IAT sensor or PCM connector • PCM malfunction

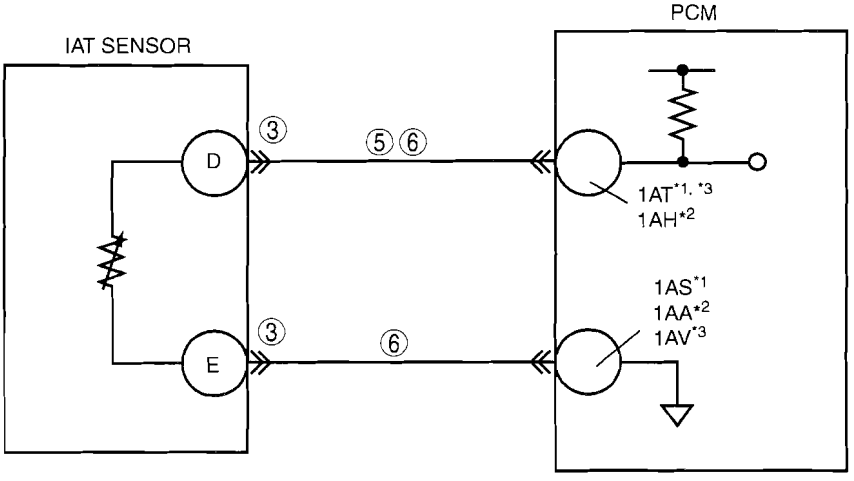
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify for related service Bulletins and/or on-line repair information availability. • Is any related service information available?	Yes	Perform repair or diagnosis according to the available service information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF MAF/IAT SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT IAT SENSOR** • Inspect the IAT sensor. (See 01-40A-52 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[LF, L3]) • Is the IAT sensor normal?	Yes	Replace the MAF/IAT sensor, then go to Step 6. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and run the engine under FREEZE FRAME DATA condition. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

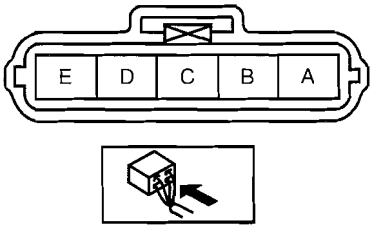
DTC P0112[LF, L3]

id0102a3803700

DTC P0112	IAT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal. If the PCM detects the IAT sensor voltage **below 0.16 V**, the PCM determines that the IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at MAF/IAT sensor or PCM connector • Short to ground in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT*1, *3, 1AH*2 • Short each wiring harness IAT signal circuit and IAT ground circuit • PCM malfunction



MAF/IAT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

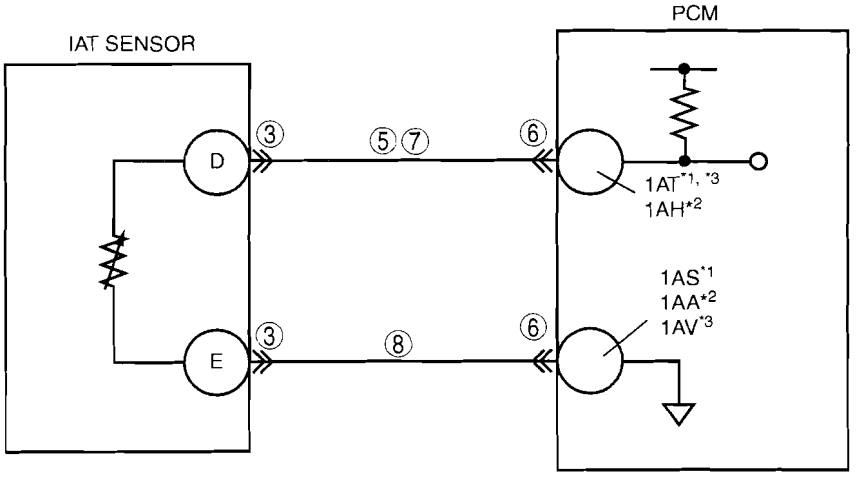
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT IAT SENSOR TERMINAL** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for bent terminal of MAF/IAT sensor terminals D and E (part-side). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to DLC-2. • Access IAT PID. • Verify IAT value when disconnecting the MAF/IAT sensor connector. • Does IAT value change?	Yes	Replace the MAF/IAT sensor, then go to Step 7. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for continuity between MAF/IAT sensor terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 7.
		No	Go to the next step.
6	**INSPECT IAT CIRCUITS FOR SHORT** • Inspect for continuity between MAF/IAT sensor terminals D and E (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short, then go to Step 7.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

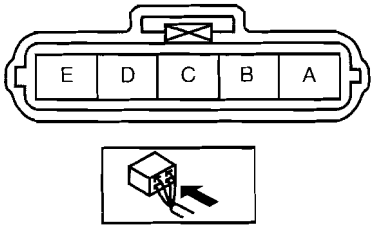
DTC P0113[LF, L3]

id0102a3803800

DTC P0113	IAT sensor circuit high input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal. If the PCM detects the IAT sensor voltage **above 4.84 V**, the PCM determines that IAT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at MAF/IAT sensor or PCM connector • Open circuit in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT*1, *3, 1AH*2 • Short to power supply in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT*1, *3, 1AH*2 • Open circuit in wiring harness between MAF/IAT sensor terminal E and PCM terminal 1AS*1, 1AA*2, 1AV*3 • PCM malfunction



MAF/IAT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT POOR CONNECTION OF IAT SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the replace the wiring terminal, then go to Step 9.
		No	Go to the next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to DLC-2. • Access IAT PID. • Connect a jumper wire between MAF/IAT sensor terminals D and E. • Verify IAT value • Is the voltage **below 4.8 V**?	Yes	Replace the MAF/IAT sensor, then go to Step 9. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between MAF/IAT sensor terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect PCM terminals 1AT*1, *3, 1AH*2 and 1AS*1, 1AA*2, 1AV*3 (wiring harness-side) for tightness using feeler tool. • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAF/IAT sensor terminal D (wiring harness-side) and PCM terminal 1AT*1*3, 1AH*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 9.
8	**INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAF/IAT sensor terminal E (wiring harness-side) and PCM terminal 1AS*1, 1AA*2, 1AV*3. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

DTC P0116[LF, L3]

id0102a3803900

DTC P0116	Engine coolant temperature circuit range/performance
DETECTION CONDITION	• The PCM monitors the maximum value and minimum value of engine coolant temperature when the engine is started and **5 min** have been passed after leaving the vehicle **6 h or more**. If difference between maximum and minimum values of engine coolant temperature is **below 6 °C {10.8 °F}** the PCM determines that there is an ECT circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor. (Engine cooling system) • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

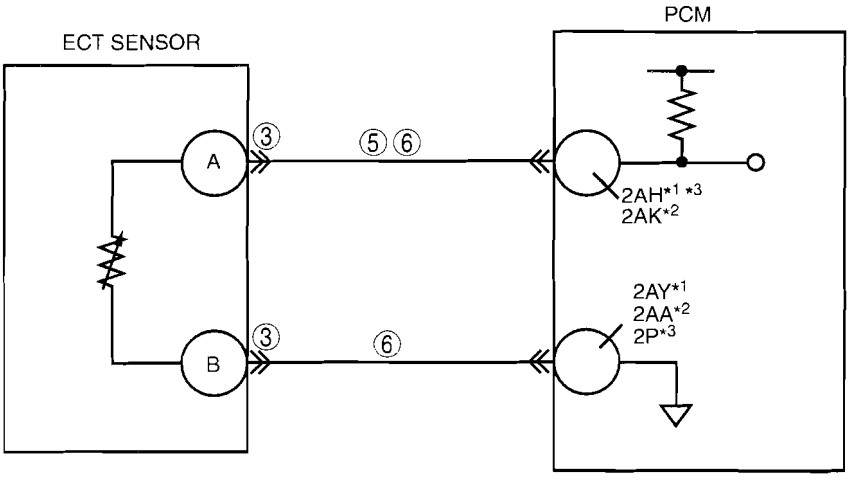
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. If the vehicle is not repaired, go to next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0116 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
4	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect ECT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
5	**INSPECT ECT SENSOR** • Inspect the ECT sensor. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the ECT sensor, then go to Step 8.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**COMPARE ECT PID VALUE** • Prepare a new ECT sensor. • Clear the DTC from the PCM memory using the M-MDS. • Connect the ECT sensor connector to the new ECT sensor without installing to the engine. • Turn the ignition switch to the ON position and record the ECT PID value. • Replace the malfunction ECT sensor with new one. • Start the engine and wait for 5 min. • Record the ECT PID value. • Is the difference between ECT PID values more than 6 °C {42 °F}?	Yes	Go to the next step.
		No	Inspect the thermostat. • If the thermostat is normal, go to the next step. • If the thermostat is not normal, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0116 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using M-MDS. • Start the engine and warm it up to completely. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

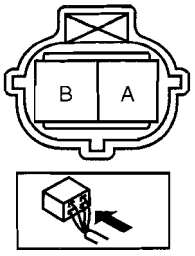
DTC P0117[LF, L3]

id0102a3804000

DTC P0117	ECT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects the ECT sensor voltage **below 0.2 V**, the PCM determines that the ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connect or terminal malfunction • Short to ground in wiring harness between ECT sensor terminal A and PCM connector terminal 2AH*1 *3, 2AK*2 • Short each wiring harness ECT signal circuit and ECT ground circuit • PCM malfunction



ECT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

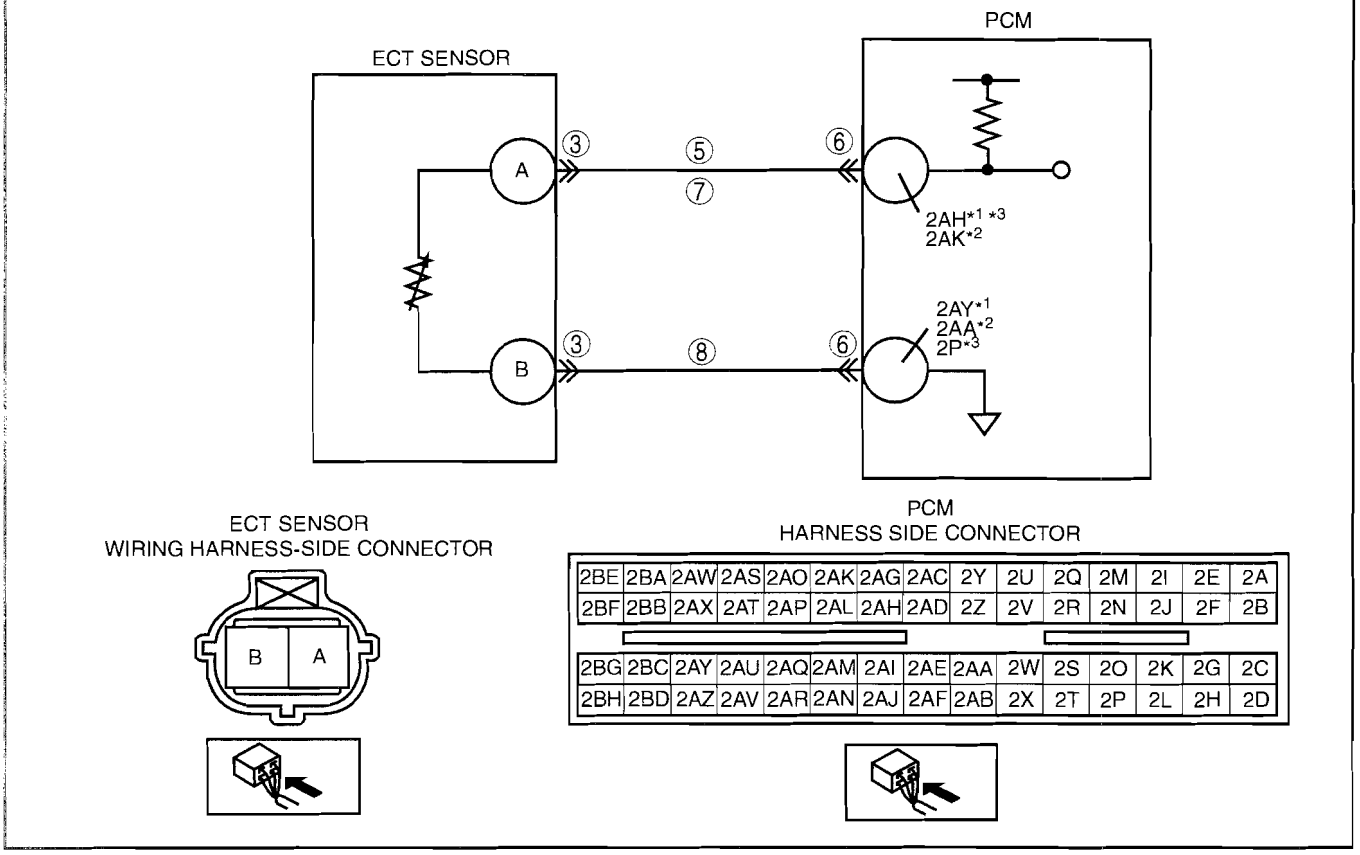
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TERMINAL BENT** • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for bent of ECT sensor terminals A and B (part-side). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to DLC-2. • Access ECT PID. • Verify ECT value when disconnecting ECT sensor connector. • Does the ECT value change?	Yes	Replace the ECT sensor, then go to Step 7. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 7.
		No	Go to the next step.
6	**INSPECT ECT CIRCUIT FOR SHORT WIRING HARNESSES** • Inspect for continuity between ECT sensor terminal A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine, or perform the KOEO or KOER self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0118[LF, L3]

id0102a3804100

DTC P0118	ECT sensor circuit high input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects the ECT sensor voltage is **above 4.58 V**, the PCM determines that the ECT sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connect or terminal malfunction • Open circuit in wiring harness between ECT sensor terminal A and PCM terminal 2AH*1 *3, 2AK*2 • Short to power supply in wiring harness between ECT sensor terminal A and PCM terminal 2AH*1 *3, 2AK*2 • Open circuit in wiring harness between ECT sensor terminal B and PCM terminal 2AY*1, 2AA*2, 2P*3 • PCM malfunction



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

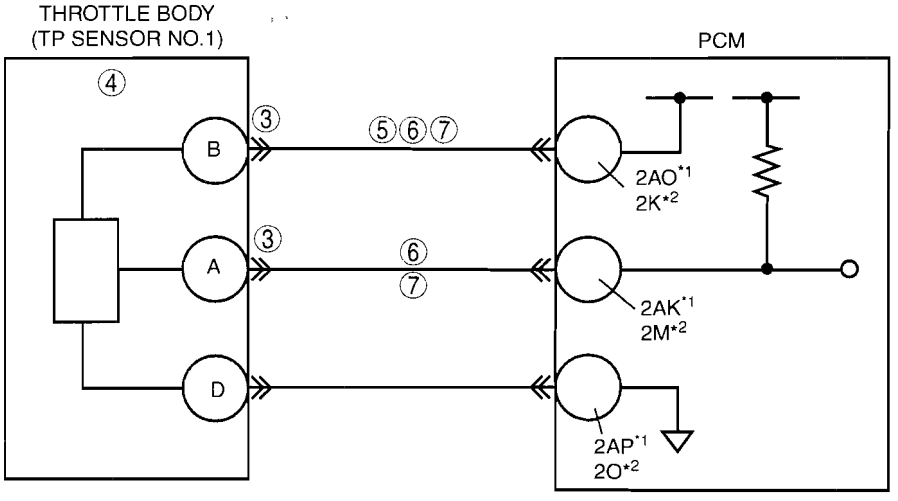
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect ECT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to the DLC-2. • Access ECT PID. • Connect a jumper wire between ECT sensor terminals A and B. • Verify the ECT value. • Is the voltage **4.6 V or below**?	Yes	Replace the ECT sensor, then go to Step 9.
		No	Go to the next step.
5	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ECT sensor terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect the continuity between ECT sensor terminal A (wiring harness-side) and PCM terminal 2AH*1, 2AK*2, 2AH*3. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between ECT sensor terminal B (wiring harness-side) and PCM terminal 2AY*1, 2AA*2, 2P*3. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine, or perform the KOEO or KOER self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

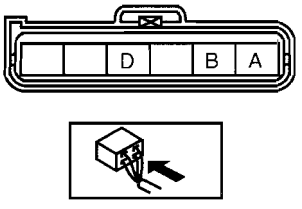
DTC P0122[LF, L3]

id0102a3804200

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	• If the PCM detects the TP sensor voltage is **below 0.1 V*3, 0.2 V*4** while the engine running to on, the PCM determines that the TP circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions in first drive cycles. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Short to ground in wiring harness between TP sensor terminal A and PCM terminal 2AK*1, 2M*2 • Open circuit in wiring harness between TP sensor terminal A and PCM terminal 2AK*1, 2M*2 • Short to ground in wiring harness between TP sensor terminal B and PCM terminal 2AO*1, 2K*2 • Open circuit in wiring harness between TP sensor terminal B and PCM terminal 2AO*1, 2K*2



THROTTLE BODY
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

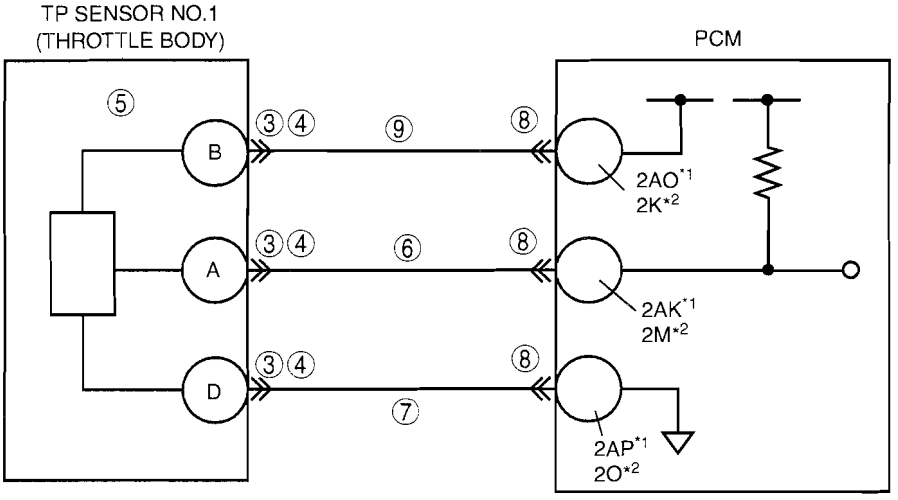
STEP	INSPECTION		ACTION
3	**CLASSIFY TP SENSOR OR HARNESS MALFUNCTION** • Connect M-MDS. • Access TP1 PID. • Disconnect throttle body connector. • Connect a jumper wire between throttle body terminals A and B (wiring harness-side). • Is the voltage **above 4.9 V**?	Yes	Go to the next step.
		No	Go to Step 5.
4	**INSPECT TP SENSOR** • Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) • Is TP sensor okay?	Yes	Inspect for poor throttle body connector terminal B connection. Repair or replace if necessary, then go to Step 8.
		No	Replace the throttle body, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR** **Note** • If DTC P0107 and P2228 are also retrieved with P0122, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage at throttle body terminal B (wiring harness-side). • Is the voltage **within 4.5—5.5 V**?	Yes	Go to next step.
		No	Repair or replace open circuit between throttle body connector terminal B (wiring harness-side) and PCM connector terminal 2AO*1, 2K*2 (wiring harness-side). Then, then go to Step 8.
6	**VERIFY TP1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Throttle body terminal A (wiring harness-side) and PCM terminal 2AK*1, 2M*2 (wiring harness-side) — Throttle body terminal B (wiring harness-side) and PCM terminal 2AO*1, 2K*2 (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 8.
7	**VERIFY TP1 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between the following terminals and body ground: — Throttle body terminal A (wiring harness-side) and body ground. — Throttle body terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

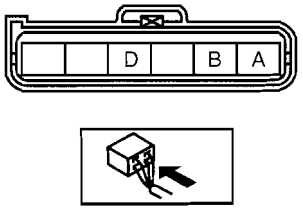
DTC P0123[LF, L3]

id0102a3804300

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	• If the PCM detects the TP sensor voltage is **above 4.9 V**[*3]**, 4.85 V**[*4] while the engine is running, the PCM determines that the TP circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in first drive cycles. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit in wiring harness between TP sensor terminal D and PCM terminal 2AP[*1], 2O[*2] • Short to constant voltage supply circuit in wiring harness between TP sensor terminal A and PCM terminal 2M • PCM malfunction



THROTTLE BODY
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to next step.

STEP	INSPECTION		ACTION
3	**INSPECT THROTTLE BODY CONNECTOR** • Turn the ignition switch off. • Verify that the throttle body connector is connected securely. • Is the connector normal?	Yes	Go to the next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT THROTTLE BODY CONNECTION FOR POOR CONNECTION** • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
5	**INSPECT TP SENSOR** • Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3]) • Is the TP sensor okay?	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 10.
6	**INSPECT TP1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal A (wiring harness-side) and body ground. • Is the voltage **above 4.9 V**?	Yes	Repair or replace short to power supply. Then, go to Step 10.
		No	Go to the next step.
7	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect for continuity between throttle body terminals A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 10.
		No	Go to the next step.
9	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between throttle body connector terminal D (wiring harness-side) and PCM connector terminal 2AP*1, 2AO*2 (wiring harness-side). • Is there continuity?	Yes	Repair or replace open circuit between TP sensor connector terminal A (wiring harness-side) and PCM connector terminal 2AP*1, 2O*2 (wiring harness-side). Then, go to the step.
		No	Go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0125[LF, L3]

id0102a3804400

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	• The PCM monitors the ECT sensor signal after engine is started at the engine is cold. If the engine coolant temperature does not reach the expected temperature for specified period, the PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Cooling system malfunction • Poor connection of connectors • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT** • Start the engine. • Warm up the engine completely. • Access ECT PID using the M-MDS. • Is ECT PID **above 60 °C {140 °F}**?	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	**INSPECT ECT SENSOR** • Inspect the ECT sensor. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ECT sensor, then go to Step 7.
6	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off). • Access ECT PID using the M-MDS. • Wait until ECT PID **below 8 °C {46 °F}***1**/below 19 °C {66 °F}***2. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

DTC P0126, P0128[LF, L3]

id0102a3815400

DTC P0126 DTC P0128	Coolant thermostat stuck open
DETECTION CONDITION	**DTC P0126** • If the ECT signal never exceeds **71 °C {160 °F}** after engine start for specified period, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **above –10 °C {14 °F}** — Vehicle speed: **over 6.0 km/h {3.7 mph}** **DTC P0128** • The PCM monitors MAF, IAT, VSS and EAT signals and calculate radiator's heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **above –10°C {14 °F}** — ECT at engine start: **Below 36 °C {97 °F}** — Difference between ECT at engine start and minimum IAT: **Below 6 °C {10.8 °F}** — Vehicle speed: **over 30 km/h {18.6 mph}** **Diagnostic support note** • This is an intermittent monitor (Engine cooling system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• ECT sensor malfunction • Cooling system malfunction • Coolant thermostat malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to the next step.
4	**INSPECT COOLANT THERMOSTAT FOR WHETHER STUCK OPEN** • Perform coolant thermostat inspection. (See 01-12A-8 THERMOSTAT INSPECTION[LF, L3].) • Is coolant thermostat normal?	Yes	Inspect ECT sensor. Replace ECT sensor if necessary, then go to the next step.
		No	Replace coolant thermostat, then go to the next step.
5	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down engine. **Note** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Turn the ignition switch to the ON position (Engine off). • Clear DTC from PCM memory using M-MDS. • Access ECT, IAT PIDs and make sure that each value is within following specifications. — ECT: **below 36 °C {97 °F}** (for P0128 only) — Difference between ECT and IAT: **Below 6 °C {43°F}** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step.
		No	Go to the next step for DTC P0126 or go to Step 7 for DTC P0128.

STEP	INSPECTION		ACTION
6	**VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using M-MDS and monitor TEST #10:E1:81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops during every **5 minutes** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **–10 °C {14 °F}**, monitoring period is **20 minutes** and ECT is **30 °C {86 °F}**, monitoring period is **8 minutes**) • Verify TEST #10:E1:81 (ECT) value. • Is value above minimum value?	Yes	Go to Step 8.
		No	Replace PCM, then go to Step 8. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
7	**VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using M-MDS and monitor TEST #10:E1:80 (Heat radiation ratio) or #10:E1:81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify TEST #10:E1:80 (Heat radiation ratio) and #10:E1:81 (ECT) value. • Are value of TEST #10:E1:80 (Heat radiation ratio) below maximum value and value of TEST #10:E1:81 (ECT) above minimum value?	Yes	Go to the next step.
		No	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0130[LF, L3]

id0102a3829500

California Emission Regulation Applicable Mode

DTC P0130	Front HO2S circuit problem
DETECTION CONDITION	• The PCM monitors the front HO2S impedance when under the front HO2S heater control. If the impedance is **more than 500 ohms**, the PCM determines that there is a front HO2S circuit problem. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

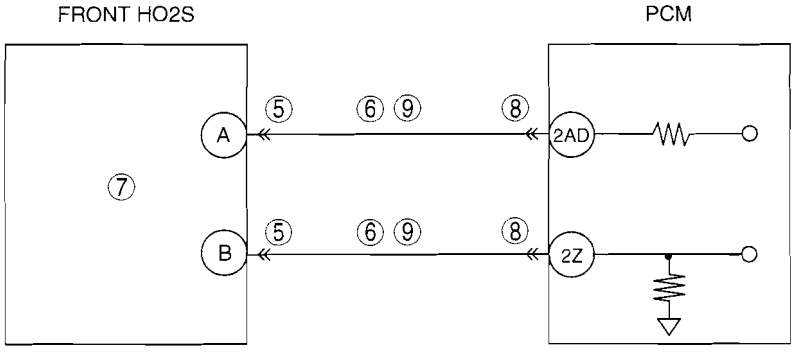
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 6. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0130 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0131[LF, L3]

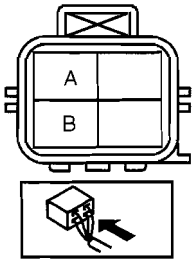
id0102a3804600

California Emission Regulation Applicable Mode

DTC P0131	Front HO2S circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is **less than 1.8 V** or the output current is **less than –5 mA**, the PCM determines that the front HO2S circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit in wiring harness between front HO2S terminal A and PCM terminal 2AD • Short to ground in wiring harness between front HO2S terminal A and PCM terminal 2AD • Open circuit in wiring harness between front HO2S terminal B and PCM terminal 2Z • Short to ground in wiring harness between front HO2S terminal B and PCM terminal 2Z • PCM malfunction

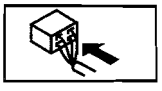


FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



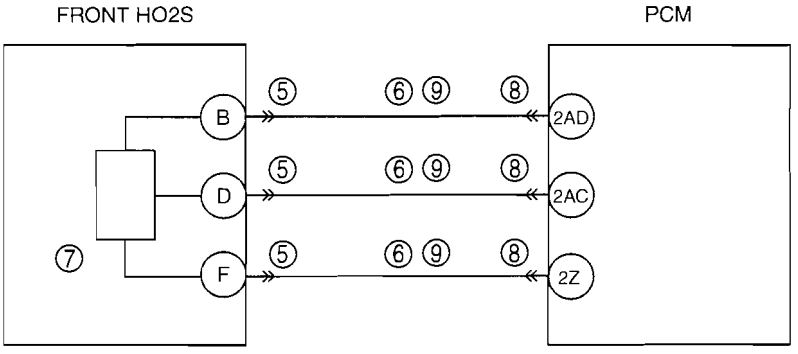
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

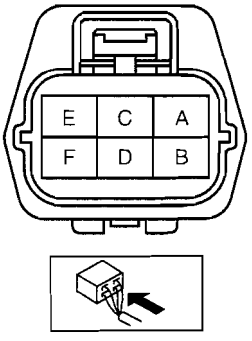
STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0131 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the front HO2S terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 10. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — Front HO2S terminal A (wiring harness-side) and PCM terminal 2AD (wiring harness-side) — Front HO2S terminal B (wiring harness-side) and PCM terminal 2Z (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0131	Front HO2S circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S while the engine is running. If the input voltage is **above 1.0 V** for **2 s**, the PCM determines that the front HO2S circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit in wiring harness between front HO2S terminal F and PCM terminal 2Z • Short to ground in wiring harness between front HO2S terminal F and PCM terminal 2Z • Open circuit in wiring harness between front HO2S terminal D and PCM terminal 2AC • Short to ground in wiring harness between front HO2S terminal D and PCM terminal 2AC • Open circuit in wiring harness between front HO2S terminal B and PCM terminal 2AD • Short to ground in wiring harness between front HO2S terminal B and PCM terminal 2AD • PCM malfunction

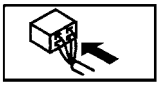


FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P0131 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — Front HO2S terminal B (wiring harness-side) and body ground — Front HO2S terminal D (wiring harness-side) and body ground — Front HO2S terminal F (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 10. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — Front HO2S terminal B (wiring harness-side) and PCM terminal 2AD (wiring harness-side) — Front HO2S terminal D (wiring harness-side) and PCM terminal 2AC (wiring harness-side) — Front HO2S terminal F (wiring harness-side) and PCM terminal 2Z (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0131 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

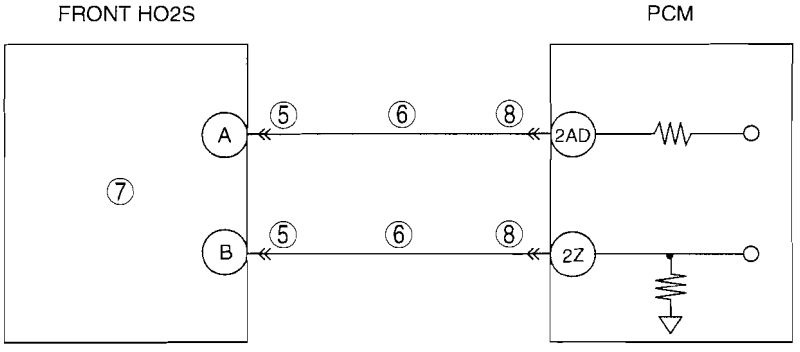
STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0132[LF, L3]

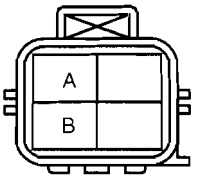
id0102a3804700

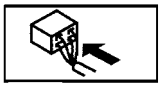
California Emission Regulation Applicable Model

DTC P0132	Front HO2S circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is **more than 3.8 V** or the output current is **more than 5 mA**, the PCM determines that the front HO2S circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal A and PCM terminal 2AD • Short to power supply in wiring harness between front HO2S terminal B and PCM terminal 2Z • PCM malfunction



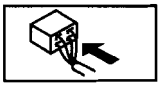
FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



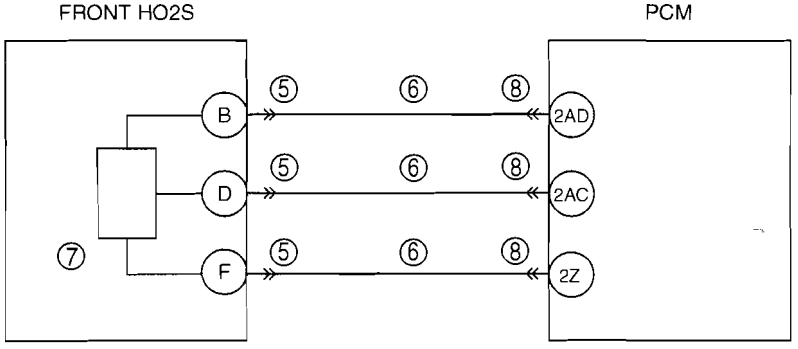
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0132 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground: — Front HO2S terminal A (wiring harness-side) and body ground — Front HO2S terminal B (wiring harness-side) and body ground • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test with M-MDS, or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

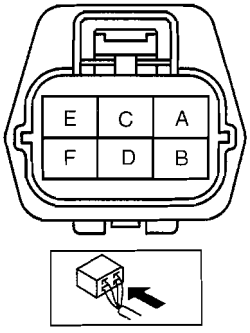
STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0132	Front HO2S circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S when the engine is running. If the input voltage is **less than 1.0 V** for **2 s**, the PCM determines that the front HO2S circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between front HO2S terminal F and PCM terminal 2Z • Short to power supply in wiring harness between front HO2S terminal D and PCM terminal 2AC • Short to power supply in wiring harness between front HO2S terminal B and PCM terminal 2AD • PCM malfunction

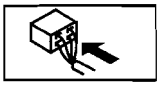


FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P0132 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground: — Front HO2S terminal B (wiring harness-side) and body ground — Front HO2S terminal D (wiring harness-side) and body ground — Front HO2S terminal F (wiring harness-side) and body ground • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0132 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0133[LF, L3]

id0102a3804800

DTC P0133	Front HO2S circuit problem
DETECTION CONDITION	• The PCM monitors the peak differential value of oxygen sensor signal after A/F fluctuation being provided when the following conditions are met. If the peak differential value is lower than the threshold value. • The PCM determines that the front HO2S circuit is slow **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode — Following conditions are met: • Front HO2S heater monitor is completed. • Fuel system loop status is closed loop fuel control. — Engine speed: **1,500—3,500 rpm (MTX), 1,350—3,500 rpm (ATX)** — Charging efficiency: **18—60 % *1, 21—60 % *2** (at engine speed: **2,500 rpm**) — Intake air volume: **5—40 g/s** — Engine coolant temperature **above 70 °C {158 °F}** **Diagnostic support note** • This is an intermittent monitor. (HO2S) • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S malfunction • Front HO2S looseness • Fuel pump malfunction • Clogged or restricted fuel filter (built-in fuel pump unit) • Fuel leakage in fuel line between fuel distribution pipe and fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Improper connection purge solenoid hose • Insufficient compression • Engine malfunction (Engine coolant leakage)

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service information. If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending or stored DTCs using the M-MDS. • Is the DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P0133 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S11 PID using the M-MDS. • Inspect PID under following accelerator pedal conditions in PARK (ATX) or NEUTRAL (MTX). • Is PID normal? — **−1.0 —1.0 A** when idle — **More than 0.25 mA** just after release of accelerator pedal (lean condition).	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if the front HO2S is loosely installed. • Is the front HO2S installed securely?	Yes	Go to the next step.
		No	Retighten the front HO2S, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if there is any gas leakage is found between the exhaust manifold and front HO2S. • Is there gas leakage?	Yes	Repair or replace the malfunctioning exhaust part, then go to Step 13.
		No	Replace the sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access the LONGFT1 PID. • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	The engine is driven under rich condition. Go to the next step.
		No	The engine is driven under lean condition. Go to Step 10.
9	**INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect the fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Inspect the fuel pump maximum pressure, and fuel return pipe for clogging. (See 01-14A-20 FUEL PUMP UNIT INSPECTION[LF, L3].) • If there is any problem, repair or replace the parts. • If all items above are normal, replace the fuel pump unit. Then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)** • Turn the ignition switch off. • Inspect the fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Go to the next step.

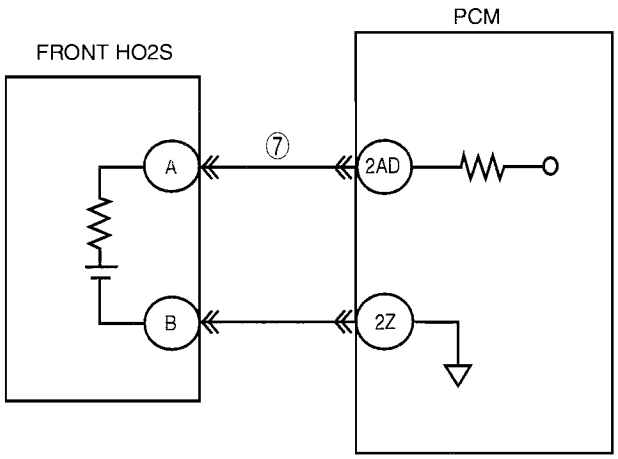
STEP	INSPECTION		ACTION
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect the fuel line for any leakage. • Is there fuel leakage?	Yes	Replace the fuel line, then go to Step 13.
		No	Inspect the fuel filters for the following: • Foreign material or stain inside the fuel filter (low-pressure side) Perform the following actions according to the result. • If foreign material or stain is found inside the fuel filter (low-pressure side), clean the fuel tank and fuel filter. • If normal, replace the fuel pump unit. Then go to Step 13.
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0134[LF, L3]

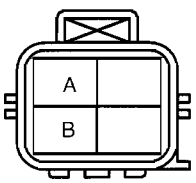
id0102a3804900

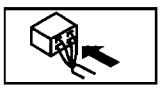
California Emission Regulation Applicable Model

DTC P0134	Front HO2S no activity detected
DETECTION CONDITION	• The PCM monitors the front HO2S element impedance when the following conditions are met. If the front HO2S element impedance is **150 ohms or more**, the PCM determines that front HO2S is not activated. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC Repair Verification Drive Mode — Following conditions are met • Time from engine start is **above 30 s** (ECT when engine start is **20 °C {68 °F}**). **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • Open circuit or short to ground in wiring harness between front HO2S terminal A and PCM terminal 2AD • Engine malfunction



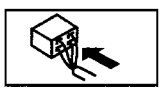
FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

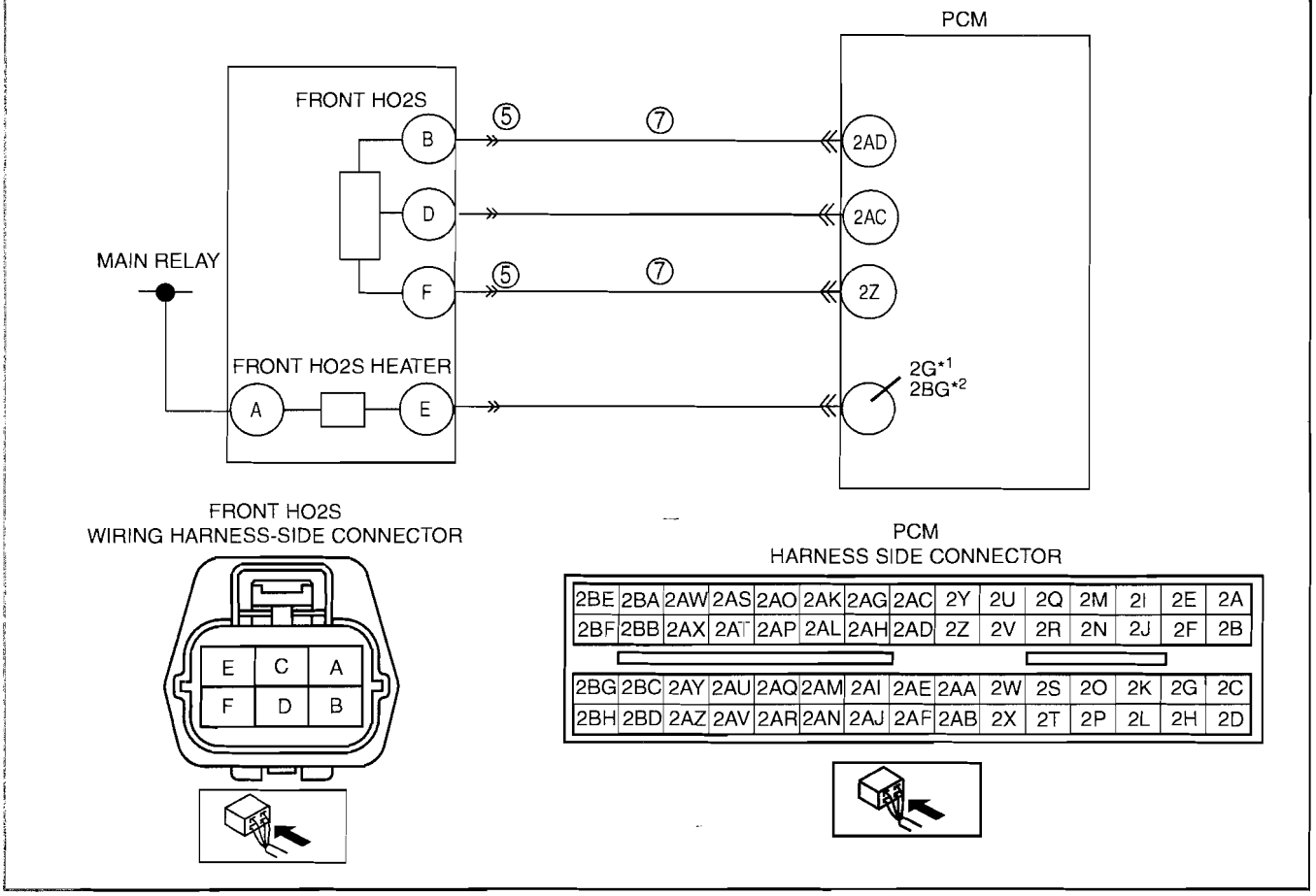
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** **Note** • If fuel monitor DTC, DTC P0132 is retrieved, ignore it until P0134 is fixed. • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending and stored DTCs using the M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using M-MDS. • Verify PID while racing engine in PARK (ATX) or NEUTRAL (MTX). • Is PID normal? — **Less than 1 mA** when suddenly depressing accelerator pedal (rich condition) — **More than 1 mA** just after releasing the of accelerator pedal (lean condition)	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if the front HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Install sensor securely, then go to Step 10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if the re is any gas leakage between the exhaust manifold and front HO2S. • Is there gas leakage?	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	• Inspect the following harnesses for open circuit or short to ground, repair or replace wiring harness if necessary. — Front HO2S terminal A (wiring harness-side) to PCM terminal 2AD (wiring harness-side) • If all items above are normal, replace malfunctioning sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the ENGINE COOLANT LEAKAGE INSPECTION. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to inspection results, then go to Step 10.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from memory using the M-MDS. • Perform the KOEO self-test with M-MDS, or PCM Adaptive Memory Produce Drive Mode and the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0134	Front HO2S no activity detected
DETECTION CONDITION	• The PCM monitors the input voltage from front HO2S when the following conditions are met. Under the following monitoring conditions, the input voltage **more than 3.22 V**, the PCM determines that the front HO2S is not activated. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC Repair Verification Drive Mode — Following conditions are met • Front HO2S heater is turned on **for more than 30 s**. • Battery voltage: **10 —18 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • Leakage exhaust system • Open or short circuit in wiring harness between front HO2S terminal D and PCM terminal 2AC • Open or short circuit in wiring harness between front HO2S terminal B and PCM terminal 2AD • Insufficient compression • Engine malfunction

DTC P0134	Front HO2S no activity detected



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** **Note** • If fuel monitor DTC, DTC P0132 is retrieved, ignore it until P0134 is fixed. • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending and stored DTCs using the M-MDS. • Is the DTC P2237 or P2251 also present?	Yes	Go to the appropriate DTC troubleshooting procedures.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up engine. • Access O2S11 PID using the M-MDS. • Verify PID while racing engine in PARK (ATX) or NEUTRAL (MTX). • Is PID normal? — **−1.0 —1.0 A** when idle — **More than 0.25 mA** just after releasing the of accelerator pedal (lean condition)	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if the front HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Install sensor securely, then go to Step 10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if there is any gas leakage between the exhaust manifold and front HO2S. • Is there gas leakage?	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	• Inspect the following harnesses at wiring harness-side connector terminals for open or short circuit, repair or replace wiring harness if necessary. — Front HO2S terminal B and PCM terminal 2AD — Front HO2S terminal D and PCM terminal 2AC — Front HO2S terminal F and PCM terminal 2Z — Front HO2S terminal E and PCM terminal 2G*1, 2BG*2 • If all items above are normal, replace malfunctioning sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the ENGINE COOLANT LEAKAGE INSPECTION. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to inspection results, then go to Step 10.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from memory using the M-MDS. • Perform the KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P0134 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

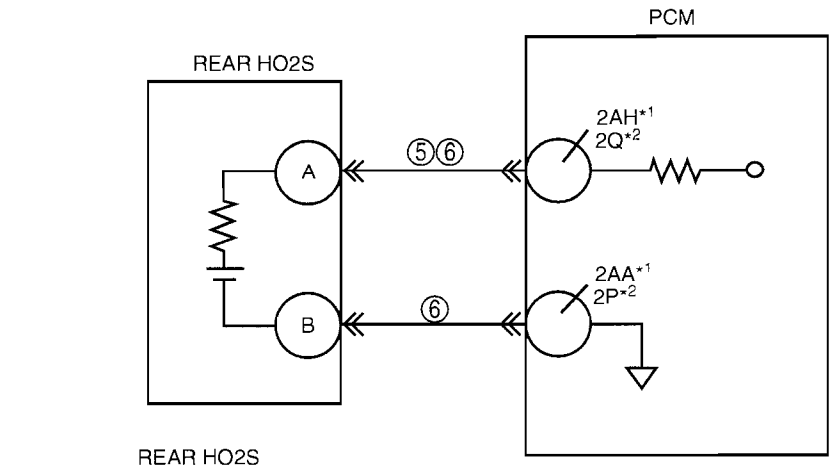
*1 : LF ATX
*2 : LF MTX, L3

DTC P0137[LF, L3]

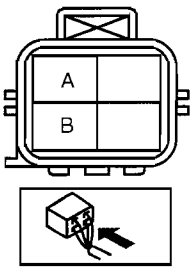
id0102a3805000

Except for California Emission Regulation Applicable Model

DTC P0137	Rear HO2S circuit low input
DETECTION CONDITION	• The PCM monitors input voltage from rear HO2S. If the input voltage from the rear HO2S is below **0.1 V** for **35.2 s** the PCM determines that circuit input is low. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC repair verification drive mode — Following conditions are met. • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Fuel injector control in rear HO2S closed loop control. • The PCM monitors the input voltage from the rear HO2S when the following conditions are met. Under the following monitoring conditions, if the input voltage from the rear HO2S does not even **exceed 0.1 V** though the short term fuel trim is controlled up to **20.5 %** for **9.6 s**, the PCM determines that sensor circuit input is low. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC repair verification drive mode — Following conditions are met for **above 20.8 s**. • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Short to ground in wiring between HO2S terminal A and PCM terminal 2AH*1, 2Q*2 • Open circuit in wiring between rear HO2S terminal A and PCM terminal 2AH*1, 2Q*2 • Open circuit in wiring between rear HO2S terminal B and PCM terminal 2P • PCM malfunction

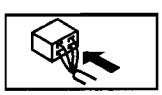


REAR HO2S WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF ATX
*2 : LF MTX, L3

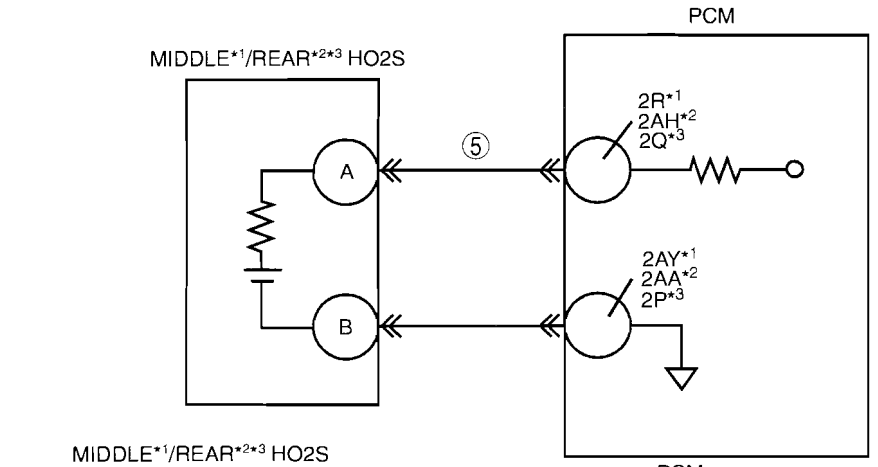
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position. (Engine off) • Verify the related PENDING CODE or stored DTCs using M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0137 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO GROUND AT HARNESS** • Turn the ignition switch to the off. • Disconnect rear HO2S and PCM connectors. • Verify the continuity between following HO2S terminal A (wiring harness side) and body ground. • Is there continuity?	Yes	Replace short to ground circuit, then go to step 8.
		No	Go to the next step.
6	**INSPECT REAR HO2S CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the off. • Inspect for continuity between the following terminals: — Rear HO2S terminal A (wiring harness-side) and PCM terminal 2Q (wiring harness-side) — Rear HO2S terminal B (wiring harness-side) and PCM terminal 2P (wiring harness-side) • Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 8.
7	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO AT REAR HO2S** • Rear HO2S connector disconnected. • Verify the continuity between following rear HO2S sensor terminal A (part side) and body ground. • Is there continuity?	Yes	Replace suspected HO2S then go to the next step.
		No	Go to the next step
8	**VERIFY TROUBLESHOOTING OF DTC P0137 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from memory using the M-MDS. • Perform the KOEO or KOER self-test • Is the PENDING CODE same DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

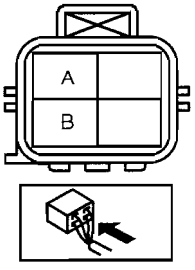
DTC P0138[LF, L3]

id0102a3805100

DTC P0138	Middle*1/Rear*2*3 HO2S circuit high input
DETECTION CONDITION	• The PCM monitors input voltage from middle*1/rear*2*3 HO2S. If the input voltage from the middle*1/rear*2*3 HO2S sensor is **above 1.2 V** for **0.5 s*1/0.8 s*2*3**, the PCM determines that circuit input is high. **Diagnostic support note** • This is a continues monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Middle*1/Rear*2*3 HO2S malfunction • Short to power supply in wiring harness between middle*1/rear*2*3 HO2S terminal A and PCM terminal 2R*1, 2AH*2, 2Q*3 • Middle*1/Rear*2*3 HO2S or PCM terminal shorted • PCM malfunction



MIDDLE*1/REAR*2*3 HO2S WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related service bulletins and/or repair Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending code or stored DTCs using M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0138 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT MIDDLE*1 /REAR*2*3 HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off. • Disconnect middle*1/rear*2*3 HO2S connector. • Turn the ignition switch to the ON position. (Engine off) • Measure the voltage between middle*1/rear*2*3 HO2S terminal A (wiring harness-side) and body ground. • Is there any voltage?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Start engine. • Access O2S12 PID using M-MDS. • Verify PID while racing engine at least **10 times** in PARK (ATX) or NEUTRAL (MTX). • Does PID stay **above 0.55 V**?	Yes	Replace sensor, then go to the next step. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Run the KOEO or KOER self-test with M-MDS, or PCM adaptive memory procedure drive mode and HO2S heater, HO2S, and TWC repair verification drive mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

DTC P0139[LF, L3]

id0102a3805200

California Emission Regulation Applicable Model

DTC P0139	Middle HO2S circuit problem
DETECTION CONDITION	• The PCM monitors inversion cycle period, middle HO2S output voltage inclination. The PCM detects that the voltage inclinations are below threshold consecutive **5 times** when following conditions are met, the PCM determines that circuit has malfunction. Under the following monitoring conditions, if **0.3 V or more** is detected three times even if fuel cut is performed for **3 s or more**, a circuit malfunction is determined. **MONITORING CONDITIONS** — PCM Adaptive Memory Production, HO2S heater, HO2S, and TWC Repair Verification Drive Mode — Following conditions are met: • Engine speed is **above 500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. **Diagnostic support note** • This is an intermittent monitor. (HO2S) • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Middle HO2S deterioration • Middle HO2S malfunction • Looseness middle HO2S • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Fuel filter (built-in fuel pump unit) clogged or restricted • Fuel leakage on fuel line from fuel distribution pipe and fuel pump • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction (Leakage engine coolant)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending and /or stored DTCs using the M-MDS. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S12 PID using M-MDS. • Inspect PID under following accelerator pedal conditions in PARK (ATX) or NEUTRAL (MTX). • Is PID normal? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition).	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF MIDDLE HO2S** • Inspect if the middle HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if there is any gas leakage is found between the exhaust manifold and middle HO2S. • Is there gas leakage?	Yes	Repair or replace malfunctioning faulty exhaust part, then go to Step 13.
		No	Replace sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to Step 10.
9	**INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)** • Turn the ignition switch off. • Inspect fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See 01-14A-20 FUEL PUMP UNIT INSPECTION[LF, L3].) • If there is any problem, repair or replace the parts. • If all items above are normal, replace fuel pump unit. Then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (Low fuel line pressure)** • Turn the ignition switch off. • Inspect fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is fuel line pressure normal?	Yes	Go to Step 12.
		No	Go to the next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect the fuel line for any leakage. • Is there fuel leakage?	Yes	Replace the fuel line, then go to Step 13.
		No	Inspect the fuel filters for the following: • Foreign materials or stain inside fuel filter (low-pressure side) Perform the following actions according to the result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean the fuel tank and filter. • If normal, replace fuel pump unit. Then go to Step 13.
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results. Then go to the next step.

STEP	INSPECTION		ACTION
13	**VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using M-MDS. • Perform the "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0139	Rear HO2S circuit problem
DETECTION CONDITION	• The PCM monitors the rich (**0.4 V**) to lean (**0.3 V**) response time of the rear HO2S. The PCM measures the response time when the following conditions are met. The PCM determines a rear HO2S response deterioration malfunction when the measured response time is more than the threshold value (**80 ms**) five consecutive times. **MONITORING CONDITIONS** — PCM Adaptive Memory Production, HO2S heater, HO2S, and TWC Repair Verification Drive Mode — Following conditions are met: • During deceleration fuel cut • Engine speed is **above 500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Rear HO2S output voltage ia **above 0.4 V**. • The PCM monitors for a time-out malfunction (when rear HO2S remains **above 0.3 V** for longer than a specified period of time during fuel cut control). The PCM measures the amount of time from when the following conditions are met until the rear HO2S output voltage drops **below 0.3 V**. The PCM determines a rear HO2S time-out malfunction when the detected time is more than the threshold value (**6 s**) three consecutive times. **MONITORING CONDITIONS** — PCM Adaptive Memory Production, HO2S heater, HO2S, and TWC Repair Verification Drive Mode — Following conditions are met: • During deceleration fuel cut • Engine speed is **above 500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Rear HO2S is activated (**more than 0.55 V**) **Diagnostic support note** • This is an intermittent monitor. (HO2S) • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S malfunction • Looseness rear HO2S • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Fuel filter (built-in fuel pump unit) clogged or restricted • Fuel leakage on fuel line from fuel distribution pipe and fuel pump • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Engine malfunction (Leakage engine coolant)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending and /or stored DTCs using the M-MDS. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S12 PID using M-MDS. • Inspect PID under following accelerator pedal conditions in PARK (ATX) or NEUTRAL (MTX). • Is PID normal? — **More than 0.55 V** when suddenly depress accelerator pedal (rich condition). — **Less than 0.55 V** just after release of accelerator pedal (lean condition).	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF REAR HO2S** • Inspect if the rear HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if there is any gas leakage is found between the exhaust manifold and rear HO2S. • Is there gas leakage?	Yes	Repair or replace malfunctioning faulty exhaust part, then go to Step 13.
		No	Replace sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access LONGFT1 PIDs • Compare it with FREEZE FRAME DATA recorded at Step 1. • Is it below FFD value?	Yes	Engine is driven under rich condition. Go to the next step.
		No	Engine is driven under lean condition. Go to Step 10.
9	**INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)** • Turn the ignition switch off. • Inspect fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See 01-14A-20 FUEL PUMP UNIT INSPECTION[LF, L3].) • If there is any problem, repair or replace the parts. • If all items above are normal, replace fuel pump unit. Then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (Low fuel line pressure)** • Turn the ignition switch off. • Inspect fuel line pressure while the engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is fuel line pressure normal?	Yes	Go to Step 12.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect the fuel line for any leakage. • Is there fuel leakage?	Yes	Replace the fuel line, then go to Step 13.
		No	Inspect the fuel filters for the following: • Foreign materials or stain inside fuel filter (low-pressure side) Perform the following actions according to the result. • If foreign material or stain is found inside fuel filter (low-pressure side), clean the fuel tank and filter. • If normal, replace fuel pump unit. Then go to Step 13.
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results. Then go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using M-MDS. • Perform the "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

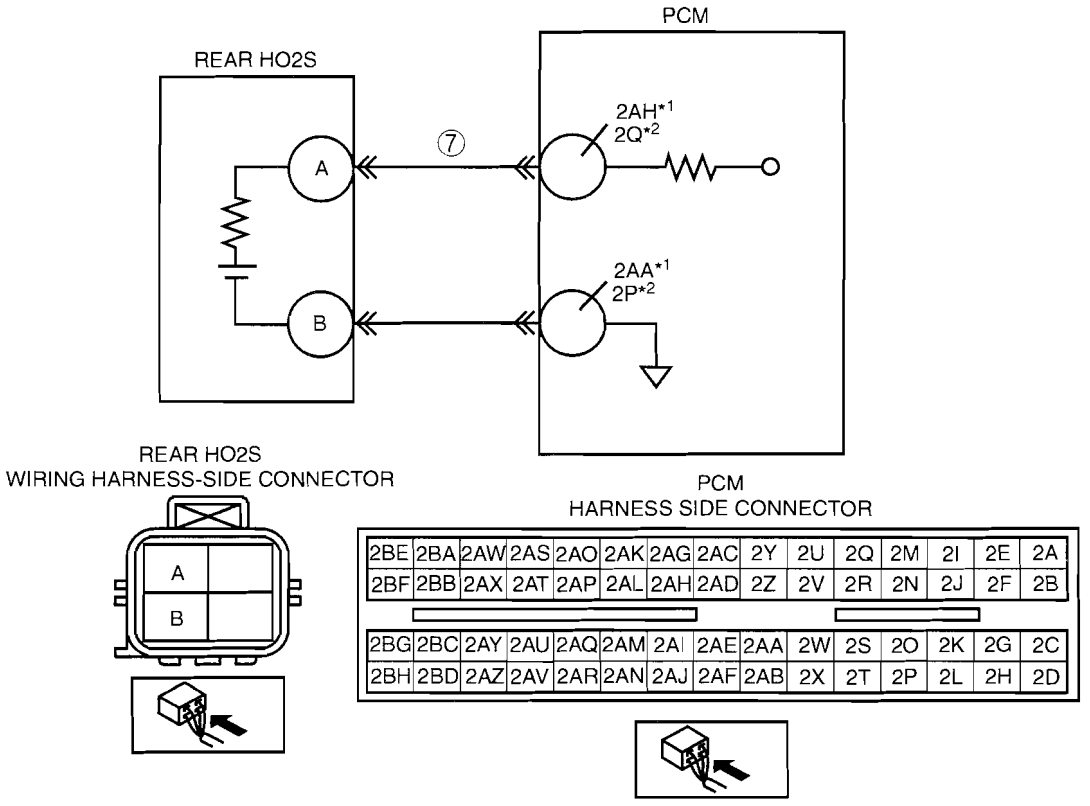
DTC P0140[LF, L3]

id0102a3805300

Except for California Emission Regulation Applicable Model

DTC P0140	Rear HO2S no activity detected
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S when the following conditions are met. if the input voltage never **exceed 0.55 V** though the short term fuel trim is controlled up to **20.5 %** for **9.6 s**, the PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC repair verification drive mode — Following conditions are met for above 20.8 s • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Rear HO2S voltage is **above 0.1 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.

DTC P0140	Rear HO2S no activity detected
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S heater malfunction • Leakage exhaust system • Open circuit or short to ground in wiring harness between rear HO2S terminal A and PCM terminal 2AH*1, 2Q*2 • Insufficient compression • Engine malfunction



*1 : LF ATX
*2 : LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING AND STORED DTC** **Note** • If fuel monitor DTC, DTC P0132 is retrieved, ignore it until P0140 is fixed. • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending and stored DTCs using M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0140 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S12 for P0140 PID using the M-MDS. • Verify PID while racing the engine at least **10 times** in PARK (ATX) or NEUTRAL (MTX). • Is PID reading normal? — **More than 0.55 V** at least once during engine racing	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF REAR HO2S** • Check if rear HO2S is loosely installed. • Is sensor installed securely?	Yes	Go to the next step.
		No	Install sensor securely, then go to Step 10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between exhaust pipe and rear HO2S. • Is there any gas leakage?	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	• Inspect the following wiring harnesses for open or short to ground circuit, repair or replace wiring harness if necessary. — Rear HO2S terminal A (wiring harness-side) to PCM terminal 2AH*1, 2Q*2 (wiring harness-side) • Repair or replace wiring harness if necessary. • If all items above are normal, replace malfunctioning sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** **Warning** • **Removing the radiator cap when the radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.** • **When removing the radiator cap, wrap a thick cloth around and turn it slowly.** • Remove radiator cap. • Perform procedure to bleed air from the engine coolant, then run the engine at idle. • Is there any small bubble, which makes the engine coolant white at filling opening? **Note** • Large bubbles are normal since they are remaining air coming out from the engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace the malfunctioning part, then go to Step 10.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the KOER self-test or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF ATX
*2 : LF MTX, L3

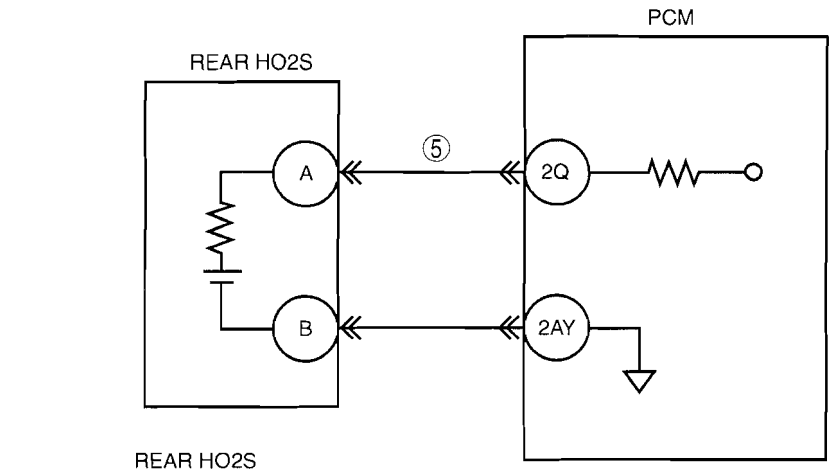
DTC P0144[LF, L3]

id0102a3829600

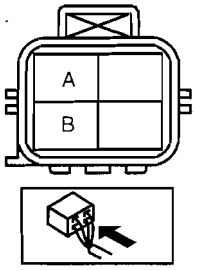
California Emission Regulation Applicable Model

DTC P0144	Rear HO2S circuit high input
DETECTION CONDITION	• The PCM monitors input voltage from rear HO2S. If the input voltage from the rear HO2S sensor is **above 1.2 V** for **0.5 s**, the PCM determines that circuit input is high. **Diagnostic support note** • This is a continues monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Short to power supply in wiring harness between rear HO2S terminal A and PCM terminal 2Q • Rear HO2S or PCM terminal shorted • PCM malfunction

DTC P0144	Rear HO2S circuit high input

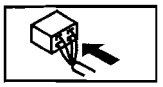


REAR HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or repair Information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending code or stored DTCs using M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0144 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off. • Disconnect rear HO2S connector. • Turn the ignition switch to the ON position. (Engine off) • Measure the voltage between rear HO2S terminal A (wiring harness-side) and body ground. • Is any voltage reading?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Start engine. • Access O2S13 PID using M-MDS. • Verify PID while racing engine at least **10 times** in PARK (ATX) or NEUTRAL (MTX). • Does PID stay **above 0.55 V**?	Yes	Repair or replace sensor, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0144 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the KOEO or KOER self-test or HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0171[LF, L3]

id0102a3818400

California Emission Regulation Applicable Model

DTC P0171	Fuel trim system too lean
DETECTION CONDITION	• PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values when closed loop fuel control. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria, PCM determines that the fuel system is too lean. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Fuel return hose clogged • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Variable valve timing control system improper operation • Air suction in intake-air system malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Is other DTCs present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to appropriate DTC troubleshooting procedures. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	If drive ability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0171 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP1, APP2, ECT, MAF, TP1 and VSS PIDs using M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • Is there any signal that is far out of specification when ignition switch is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 16.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 16.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P0171 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depress (rich condition) — **More than 1 mA** just after release of accelerator pedal (lean condition)	Yes	Inspect for air suction at followings due to cracks, damages and loosening parts: • From air cleaner to throttle body • From throttle body to dynamic chamber • From dynamic chamber to intake manifold • Vacuum hoses **Note** • Engine speed may change when rust penetrating agent is sprayed on the air suction area. Repair or replace any faulty part, then go to Step 16.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. • If there is no leakage, replace FRONT HO2S. Then go to Step 16.
8	**INSPECT MAF PID** • Start engine. • Access MAF PID using M-MDS. • Verify that MAF PID changes quickly according to race engine RPM. • Is MAF PID response normal?	Yes	Go to the next step.
		No	Replace Mass air flow sensor, then go to Step 16.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 16.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. **Note** • If engine won't start, inspect fuel line pressure with ignition switch ON. • Inspect fuel line pressure while engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is fuel line pressure normal?	Yes	Go to Step 12.
		No	• If fuel line pressure is too high: Replace fuel pump unit, then go to Step 16. • If fuel line pressure is too low: Go to the next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 16.
		No	Inspect low-pressure side fuel filter for follows: • Foreign materials or stain inside fuel filter Perform following actions as result. • If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. • If normal, replace fuel pump unit. Then go to Step 16.
12	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related harness condition (intermittent open or short) for all cylinders. • Are harness conditions normal?	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 16.
13	**INSPECT IGNITION SYSTEM OPERATION** • Carry out spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3]) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result. Then go to Step 16.
14	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Implement engine overhaul for repairs, then go to Step 19.
15	**INSPECT FUEL INJECTOR OPERATION** • Remove fuel injector. • Inspect injector operation. • Is fuel injector normal?	Yes	Go to the next step.
		No	Replace injector, then go to the next step.
16	**VERIFY TROUBLESHOOTING OF DTC P0171 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using M-MDS. • Perform the "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID changes to yes. — If not, perform the "HO2S heater, HO2S, and TWC Repair Verification Drive Mode" again. • Access PENDING CODE. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0172[LF, L3]

id0102a3818500

California Emission Regulation Applicable Model

DTC P0172	Fuel trim system too rich
DETECTION CONDITION	• The PCM monitors short fuel trim (SHRTFT) and long fuel trim (LONGFT) values when closed loop fuel control. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria, PCM determines that the fuel system is too rich. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • EGR valve improper operation • Variable tumble solenoid valve improper operation • Purge solenoid valve improper operation • Pressure regulator malfunction • Fuel pump malfunction • Fuel return hose clogged • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • PCV valve malfunction • PCM malfunction

Diagnostic procedure

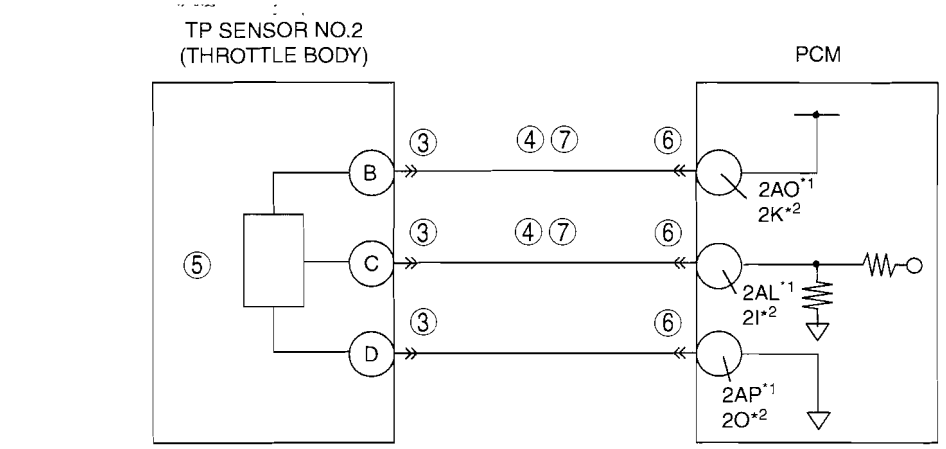
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	If drive ability concern is present, go to Step 9. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0172 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE)** • Access APP1, APP2, ECT, MAF, TP1 and VSS PIDs using M-MDS. • Is there any signal that is far out of specification when ignition switch is ON and engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 11.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect PID data while simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, and repair or replace it. Then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 PID using M-MDS. • Verify PID while racing engine (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depress (rich condition) — **More than 1 mA** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Replace the front HO2S. Then go to Step 11.
8	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. • Inspect fuel line pressure while engine running. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is fuel line pressure normal?	Yes	Go to the next step.
		No	Replace the fuel pump unit, then go to Step 11.
9	**INSPECT LONG TERM FUEL TRIM** • Turn the ignition switch off. • Disconnect purge hose from intake manifold and plug opening end of hose and intake manifold. • Access LONGFT1 PID. • Does it shift to positive value?	Yes	Inspect the purge solenoid valve. Repair or replace it if necessary, then go to Step 11.
		No	Go to the next step.
10	**INSPECT PCV VALVE OPERATION** • Inspect PCV valve operation. (See 01-16A-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Replace the PCV valve, then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0172 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using M-MDS. • Perform the "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL PID changes to yes. — If not, perform the "HO2S heater, HO2S, and TWC Repair Verification Drive Mode" again. • Access PENDING CODE. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

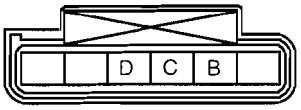
DTC P0222[LF, L3]

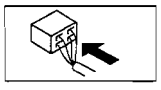
id0102a3806000

DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from TP sensor No.2 when the engine is running. If the input voltage is **below 0.1 V*3, 0.2 V*4**, the PCM determines that the TP sensor No.2 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between throttle body terminal B and PCM terminal 2AO*1, 2K*2 • Short to ground in wiring harness between throttle body terminal B and PCM terminal 2AO*1, 2K*2 • Open circuit in wiring harness between throttle body terminal C and PCM terminal 2AL*1, 2I*2 • Short to ground in wiring harness between throttle body terminal C and PCM terminal 2AL*1, 2I*2 • PCM malfunction



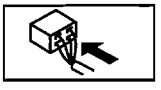
THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

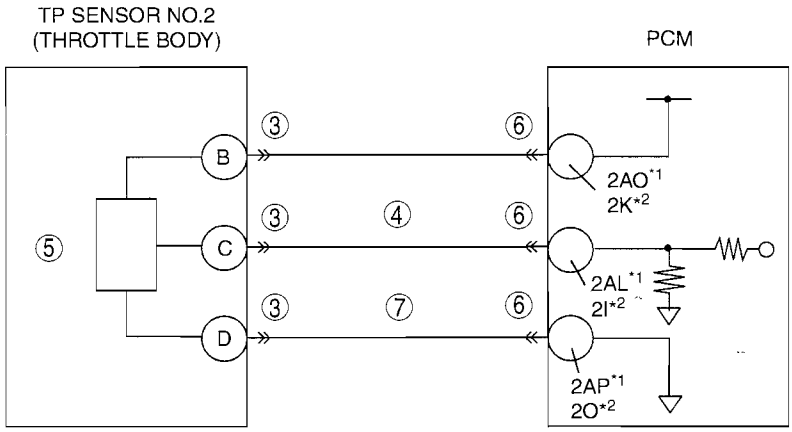
STEP	INSPECTION		ACTION
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT TP SENSOR NO.2 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — Throttle body terminal B (wiring harness-side) and body ground — Throttle body terminal C (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TP SENSOR NO.2** • Inspect TP sensor No.2. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 8. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TP SENSOR NO.2 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Throttle body terminal B (wiring harness-side) and PCM terminal 2AO*1, 2K*2 (wiring harness-side) — Throttle body terminal C (wiring harness-side) and PCM terminal 2AL*1, 2I*2 (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

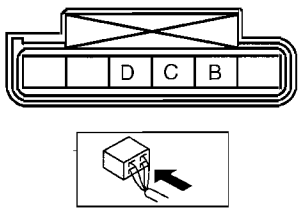
DTC P0223[LF, L3]

id0102a3806100

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from TP sensor No.2 when the engine is running. If the input voltage is **above 4.9 V**[*3]**, 4.85 V**[*4], the PCM determines that the TP sensor No.2 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.2 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between throttle body terminal C and PCM terminal 2AL[*1], 2I[*2] • Open circuit in wiring harness between throttle body terminal D and PCM terminal 2AP[*1], 2O[*2] • PCM malfunction



THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT TP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TP SENSOR NO.2** • Inspect TP sensor No.2. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 8. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TP SENSOR NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal D (wiring harness-side) and PCM terminal 2AP*1, 2O*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0300[LF, L3]

id0102a3806500

DTC P0300	Random misfire detected
DETECTION CONDITION	• The PCM monitors CKP sensor input signal interval time. The PCM calculates change of interval time for each cylinder. If change of interval time exceeds preprogrammed criteria, the PCM detects misfire in the corresponding cylinder. While the engine is running, the PCM counts number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during first drive cycle. • PENDING CODE is available if the PCM detects the misfire which affects emission performance during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • CMP sensor malfunction • Ignition coil malfunction • Ignition system malfunction • MAF sensor contamination • Excess air suction in intake air system (between MAF sensor and intake manifold) • Fuel pump malfunction • Fuel pressure regulator (built-in fuel pump unit) malfunction • Fuel line clogged • Fuel filter clogged • Fuel leakage in fuel line • Fuel runout • Poor quality fuel • Purge control solenoid valve malfunction • PCV valve malfunction • EGR valve malfunction • Vacuum hoses damages or improper connection • Related connector and terminal malfunction • Related wiring harness malfunction • Insufficient compression • Variable valve timing control system improper (L3)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP, and VSS PIDs using M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • Is there any signal that is far out of specification when the ignition switch is turned to the ON position and the engine idles?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01-40A-13 PCM INSPECTION[LF, L3].) Then go to Step 20.
		No	Go to the next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. (See 01-40A-13 PCM INSPECTION[LF, L3].) Then go to Step 20.
		No	Go to the next step.
6	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].) • Is CMP sensor normal?	Yes	Go to the next step.
		No	Inspect installation condition and damages on timing chain and gears, repair the malfunctioning part. • If it is normal, replace the CMP sensor. Then go to Step 20.
7	**VERIFY CKP SENSOR INSTALLATION CONDITION** • Inspect for CKP sensor looseness. • Is CKP sensor loosen?	Yes	Retighten the CKP sensor, then go to Step.
		No	Go to the next step.
8	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related harness condition (intermittent open or short) for all cylinders. • Are harness conditions normal?	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 20.
9	**INSPECT IGNITION SYSTEM OPERATION** • Carry out spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3]) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result. Then go to Step 20.
10	**INSPECT MAF PID** • Start the engine. • Access MAF PID using the M-MDS. • Race the engine and verify that MAF PID changes quickly according to change in the engine speed. • Is MAF PID response normal?	Yes	Go to the next step.
		No	Replace the MAF sensor, then go to Step 20.
11	**INSPECT EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM** • Inspect for air leakage at following: — Between the MAF sensor and throttle body — Between throttle body and intake manifold • Is there any malfunction?	Yes	Repair or replace suspected part, then go to Step 20.
		No	Go to the next step.
12	**INSPECT FUEL LINE PRESSURE** • Inspect fuel line pressure. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is fuel line pressure normal?	Yes	Go to Step 14.
		No	If the fuel line pressure is too low, go to the next step. If the fuel line pressure is excess high, replace the fuel pump unit, then go to Step 20.
13	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for fuel leakage. • Is there any fuel leakage?	Yes	Replace suspected fuel line, then go to Step 20.
		No	Inspect fuel filters for following: • Foreign materials or stain inside fuel filter (low-pressure side) Perform following actions depend on the result above. • If foreign materials or stain is found inside fuel filter (low-pressure side), clean the fuel tank and filter (low-pressure side). • If normal, replace the fuel pump unit. Then, go to Step 20.

STEP	INSPECTION		ACTION
14	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step. (L3) Go to Step 16. (LF)
		No	Perform engine overhaul for repairs, then go to Step 20.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3]) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 20.
16	**INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE** • Turn the ignition switch off. • Connect the vacuum pump to purge control solenoid valve and apply vacuum to solenoid. • Verify that solenoid holds vacuum. • Turn the ignition switch to the ON position (Engine off). • Access EVAPCP PID in SIMULATION TEST using the M-MDS. • Set duty value to **100%** for EVAPCP PID. • Apply vacuum while turning solenoid from OFF to ON and simulating EVAPCP PID with **100%** duty value. • Verify that solenoid releases vacuum while solenoid is turned ON. • Is purge control solenoid valve operation normal?	Yes	Go to the next step.
		No	Replace the purge control solenoid valve, then go to Step 20.
17	**INSPECT PCV VALVE OPERATION** • Turn the ignition switch off. • Remove PCV valve and inspect valve operation. (See 01-16A-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3].) • Is PCV valve operation normal?	Yes	Replace the PCV valve, then go to Step 20.
		No	Go to the next step.
18	**INSPECT OPERATION OF EGR VALVE** • Remove the EGR valve. • Visually inspect the EGR valve for stuck to open. • Is EGR valve stuck to open?	Yes	Repair or replace the EGR valve, then go to Step 20.
		No	Go to the next step.
19	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace malfunctioning part according to inspection results. Then go to the next step.
		No	Go to the next step.
20	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Perform the KOER self-test or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
21	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0301, P0302, P0303, P0304[LF, L3]

id0102a3806600

DTC P0301 **DTC P0302** **DTC P0303** **DTC P0304**	**Cylinder No.1 misfire detected** **Cylinder No.2 misfire detected** **Cylinder No.3 misfire detected** **Cylinder No.4 misfire detected**
DETECTION CONDITION	• The PCM monitors CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during first drive cycle. • PENDING CODE is available if the PCM detects the misfire which affects emission performance during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Spark plug malfunction • Ignition system malfunction • Fuel injector malfunction • Air suction in intake air system (between dynamic chamber and cylinder head) • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON /IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP and VSS PIDs using M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • Is there any signal that is far out of specification when ignition switch is turned to the ON position and engine idles?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 14. (See 01-40A-13 PCM INSPECTION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 14. (See 01-40A-13 PCM INSPECTION[LF, L3].)
		No	Go to the next step.
6	**INSPECT SPARK PLUG CONDITION** • Turn the ignition switch off. • Remove spark plug from suspected cylinder. • Inspect spark plug condition: — Cracks — Excess wear — Gap — Wet • Is any problem found on spark plug?	Yes	• If spark plug is wet, fuel flooding is suspected. Then go to Step 14. • If spark plug has a cracks, excessive wear or improper gap, replace the malfunctioning spark plug. Then go to Step 14.
		No	Go to the next step.
7	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related harness condition (intermittent open or short) for suspected cylinder. • Are harness conditions normal?	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 14.
8	**INSPECT IGNITION SYSTEM OPERATION** • Carry out spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is strong blue spark visible at suspected cylinder?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result. Then go to Step 14.
9	**INSPECT FOR AIR SUCTION AT INTAKE-AIR SYSTEM** • Inspect for air leakage at following: — Around connection of dynamic chamber and intake manifold — Around connection of intake manifold and cylinder head • Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 14.
		No	Go to the next step.
10	**INSPECT FUEL INJECTOR WIRING HARNESS** • Remove intake air system parts. • Disconnect the fuel injector connector on suspected cylinder. • Connect NOID LIGHT to fuel injector terminals. • Inspect dim of light during cranking. • Does noid light illuminate?	Yes	Go to the next step.
		No	Inspect for fuel injector wiring harnesses. Repair or replace it if necessary, then go to Step 14.
11	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace malfunctioning part according to inspection results. Then go to Step 14.
		No	Go to the next step.
12	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to the next step.
13	**INSPECT FUEL INJECTOR OPERATION** • Remove the fuel injector from suspected cylinder. • Switch the injector with the injector on other cylinder. • Start the engine and idle it. • Is misfire DTC for cylinder which has a suspected fuel injector?	Yes	Replace the injector, then go to the next step.
		No	Go to the next step.

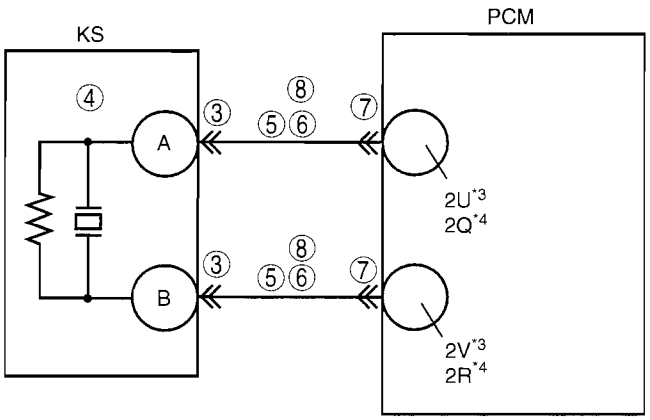
STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0327[LF, L3]

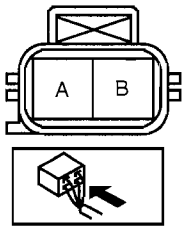
id0102a3806700

DTC P0327	KS circuit low input
DETECTION CONDITION	• The PCM monitors input signal from the KS when the engine is running. If the input voltage between PCM terminals for the KS circuit is **below 0.01 V**[*1], **below 0.06 V**[*2] the PCM determines that the KS circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• KS malfunction • Connector or terminal malfunction • Open circuit or short to ground in wiring harness between KS connector terminal A and PCM terminal 2U[*3], 2Q[*4] • Open circuit or short to ground in wiring harness between KS connector terminal B and PCM terminal 2V[*3], 2R[*4] • Short KS two wires • PCM malfunction

DTC P0327	KS circuit low input

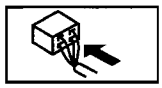


KS
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model
*3 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*4 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT KS CONNECTOR TERMINAL** • Turn the ignition switch off. • Disconnect the KS connector. • Inspect for poor connection at terminals A and B (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT KS** • Perform KS inspection. (See 01-40A-72 KNOCK SENSOR (KS) INSPECTION[LF, L3].) • Is KS normal?	Yes	Go to the next step.
		No	Replace the KS, then go to the next step.

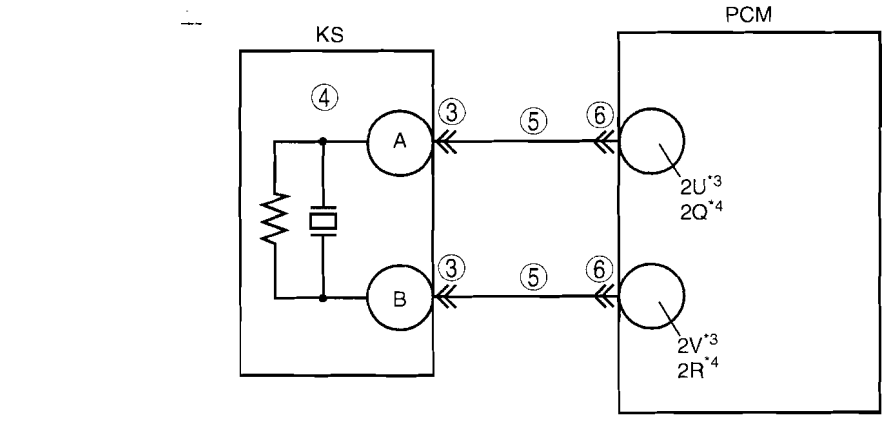
STEP	INSPECTION		ACTION
5	**INSPECT KS CIRCUITS FOR SHORT TO GROUND** • Inspect the continuity between following terminals: — KS female terminal A (wiring harness-side) and body ground — KS female terminal B (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace suspected wiring harness, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FOR SHORT CIRCUITS** • Inspect for continuity between KS female terminals A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR TERMINAL** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at terminals 2U*3 and 2V*3, 2Q*4 and 2R*4 (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT KS CIRCUITS FOR OPEN CIRCUIT** • Disconnect the PCM connector. • Inspect for continuity between the following terminals: — KS female terminal A (wiring harness-side) and PCM terminal 2U*3, 2Q*4 (wiring harness-side) — KS female terminal B (wiring harness-side) and PCM terminal 2V*3, 2R*4 (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 9.
9	**VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model
*3 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*4 : Except for California emission regulation applicable model with LF ATX

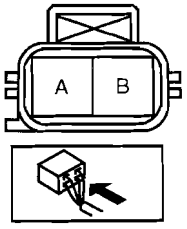
DTC P0328[LF, L3]

id0102a3806800

DTC P0328	KS circuit high input
DETECTION CONDITION	• The PCM monitors the input signal from the KS when the engine is running. If the input voltage between PCM terminals for the KS circuit is **above 4.77 V***1, **above 4.9 V***2 the PCM determines that KS circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• KS malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between KS terminal A and PCM terminal 2U*3, 2Q*4 • Short to power supply in wiring harness between KS terminal B and PCM terminal 2V*3, 2R*4 • PCM malfunction

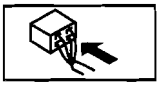


KS
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model
*3 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*4 : Except for California emission regulation applicable model with LF ATX

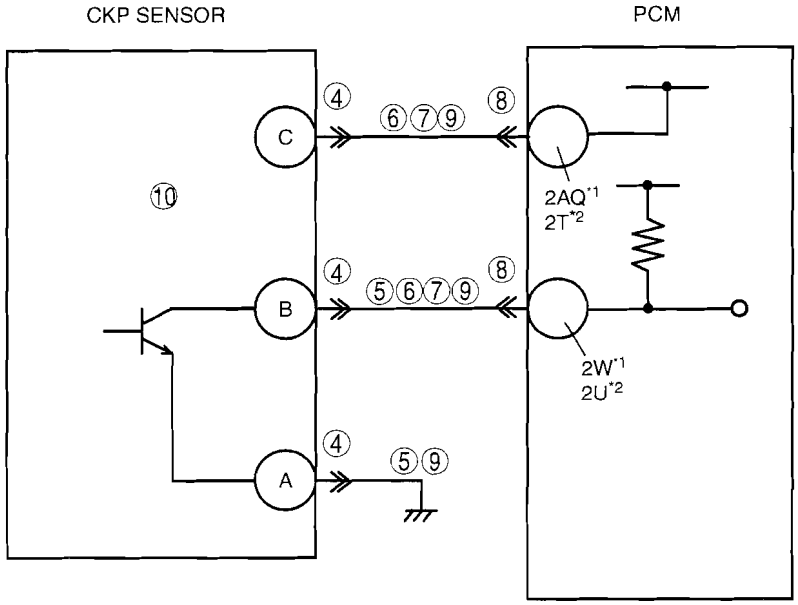
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT KS CONNECTOR TERMINAL** • Turn the ignition switch off. • Disconnect KS connector. • Inspect for poor connection at terminals A and B (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT KS** • Perform KS inspection. (See 01-40A-72 KNOCK SENSOR (KS) INSPECTION[LF, L3].) • Is the KS normal?	Yes	Go to the next step.
		No	Replace the KS, then go to Step 7.
5	**INSPECT KNOCK SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between KS terminal A (wiring harness-side) and body ground and KS terminal B (wiring harness-side) and body ground? • Is any voltage reading?	Yes	Repair or replace wiring harness for short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR** • Disconnect PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

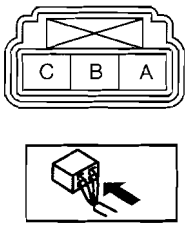
DTC P0335[LF, L3]

id0102a3806900

DTC P0335	CKP sensor circuit problem
DETECTION CONDITION	• If the PCM does not receive the input voltage from the CKP sensor for **4.2 s** while the MAF is **1.95 g/s {0.25 lb/min.} or above**, the PCM determines that the CKP sensor circuit has a malfunction. • If a malfunction is detected in the input pulse pattern from the CKP sensor. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty. • Short to the power supply between CKP sensor terminal B and PCM terminal 2W*1, 2U*2 • Short to ground between CKP sensor terminal C and PCM terminal 2AQ*1, 2T*2 • Short to ground between CKP sensor terminal B and PCM terminal 2W*1, 2U*2 • Open circuit between CKP sensor terminal A and body ground • Open circuit between CKP sensor terminal B and PCM terminal 2W*1, 2U*2 • Open circuit between CKP sensor terminal C and PCM terminal 2AQ*1, 2T*2 • CKP sensor pulse wheel malfunction • Both CKP sensor wires are shorted to each other • PCM malfunction



CKP SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CKP SENSOR VOLTAGE** • Disconnect the CKP sensor connector. • Connect the voltmeter between the CKP sensor connector terminals B and C (sensor-side). • Inspect the voltage in the AC range while cranking the engine. • Is there any voltage?	Yes	Go to the next step.
		No	Go to step 10.
4	**INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CKP sensor connector is connected securely. • Is connector normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 11.
5	**INSPECT CKP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off • Disconnect the CKP sensor connector. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between following terminals (wiring harness-side): — CKP sensor terminal B • Is the voltage **B+**?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
6	**INSPECT CKP CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between following terminal and body ground: — CKP sensor connector terminal C (wiring harness-side) — CKP sensor connector terminal B (wiring harness-side) • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
7	**INSPECT CKP CIRCUITS FOR SHORT CIRCUIT** • Inspect for continuity between CKP sensor connector terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 11.
		No	Go to the next step.
9	**INSPECT CKP CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the following circuits: — CKP sensor terminal A (wiring harness-side) and body ground — CKP sensor terminal B (wiring harness-side) and PCM terminal 2W*1, 2U*2 (wiring harness-side) — CKP sensor terminal C (wiring harness-side) and PCM terminal 2AQ*1, 2T*2 • Are there continuity?	Yes	Go to Step 11.
		No	Repair or replace the suspected wiring harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT CKP SENSOR** • Turn the ignition switch off. • Perform the CKP sensor inspection. (See 01-40A-68 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3]) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Inspect the CKP sensor pulse wheel for damage. Replace the CKP sensor pulse wheel and go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Access the MAF PID using the M-MDS. **Note** • The MAF PID should indicate **1.95 g/s {0.25 lb/min.} or above** during this test • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

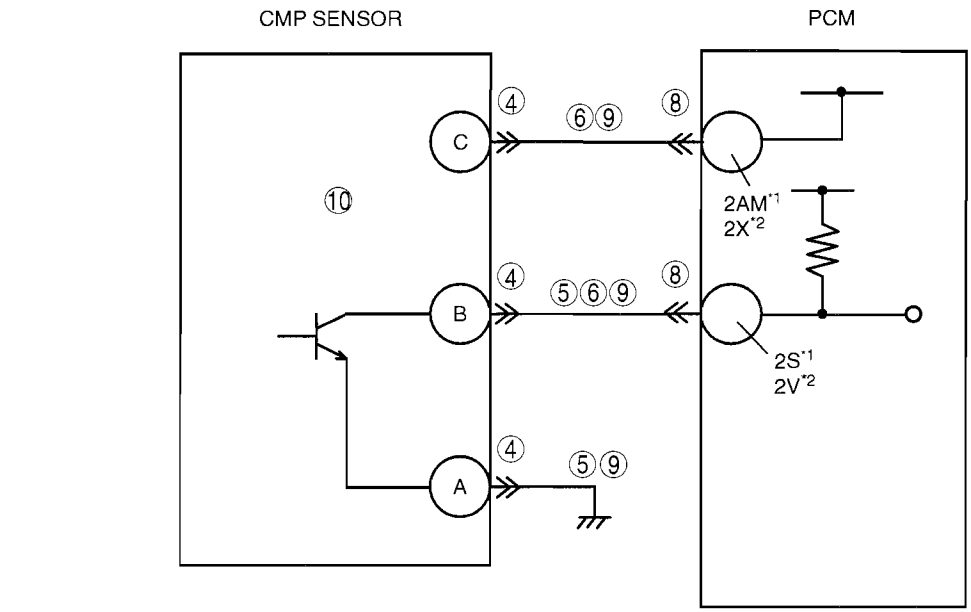
*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0340[LF, L3]

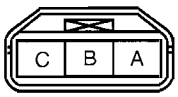
id0102a3807000

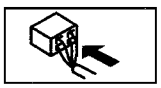
DTC P0340	CMP sensor circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the CMP sensor when the engine is running. If the PCM does not receive the input voltage from the CMP sensor while the PCM receives the input signal from the CKP sensor, the PCM determines that the CMP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor malfunction • Connector or terminal malfunction • CMP sensor is dirty • Short to the power circuit between CMP sensor terminal B and PCM terminal 2S*1, 2V*2 • Short to ground circuit between CMP sensor terminal C and PCM terminal 2AM*1, 2X*2 • Short to ground circuit between CMP sensor terminal B and PCM terminal 2S*1, 2V*2 • Open circuit between CMP sensor terminal A and body ground • Open circuit between CMP sensor terminal B and PCM terminal 2S*1, 2V*2 • Open circuit between CMP sensor terminal C and PCM terminal 2AM*1, 2X*2 • Both CMP sensor wires are shorted to each other • CKP sensor pulse wheel malfunction • CKP sensor misinstallation • Timing chain misinstallation • Loose timing chain or improper valve timing • Loose camshaft sprocket lock bolt • Loose crankshaft pulley lock bolt • PCM malfunction

DTC P0340	CMP sensor circuit problem



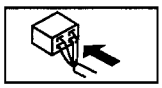
CMP SENSOR
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CMP SENSOR VOLTAGE** • Disconnect the CMP sensor connector. • Connect a voltmeter between CMP sensor connector terminals B and C (sensor-side). • Inspect the voltage in AC range while cranking the engine. • Is there any voltage?	Yes	Go to the next step.
		No	Go to step 10.
4	**INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CMP sensor connector is connected securely. • Is the connector normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 15.

STEP	INSPECTION		ACTION
5	**INSPECT CMP CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch off. • Disconnect the CMP sensor connector. • Turn ignition switch to the ON position (Engine off) • Measure voltage between the CMP sensor connector terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
6	**INSPECT CMP CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between the following terminal and body ground: — CMP sensor connector terminal B (wiring harness-side) — CMP sensor connector terminal C (wiring harness-side) • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
7	**INSPECT CMP CIRCUITS FOR SHORT CIRCUIT** • Inspect for continuity between CMP sensor connector terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 15.
		No	Go to the next step.
9	**INSPECT CMP CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the following circuits: — CMP sensor terminal A (wiring harness-side) and body ground — CMP sensor terminal B (wiring harness-side) and PCM terminal 2S*1, 2V*2 (wiring harness-side) — CMP sensor terminal C (wiring harness-side) and PCM terminal 2AM*1, 2X*2 (wiring harness-side) • Is there continuity?	Yes	Go to Step 11.
		No	Repair or replace the suspected wiring harness, then go to Step 15.
10	**INSPECT CMP SENSOR** • Turn the ignition switch off. • Perform the CMP sensor inspection. (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].) • Is the CMP sensor normal?	Yes	Go to the Step 15.
		No	Replace the CMP sensor and go to Step 15.
11	**VERIFY CKP SENSOR INSTALLATION** • Verify the CKP sensor installation. (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[LF, L3].) • Is the CKP sensor installed correctly?	Yes	Go to the next step.
		No	Reinstall the CKP sensor and go to Step 15.
12	**VERIFY VALVE TIMING MECHANISM INSTALLATION** • Verify the valve timing mechanism installation for the following parts: — Timing chain misinstallation — Loose camshaft sprocket lock bolt — Loose crankshaft pulley lock bolt • Is the valve timing mechanism installed correctly?	Yes	Go to the next step.
		No	Reinstall the following parts and go to Step 15. • Timing chain • Camshaft sprocket • Crankshaft pulley

STEP	INSPECTION		ACTION
13	**INSPECT STOPPER PIN MECHANISM (LF, L3)** • Remove the timing chain. • Inspect the stopper pin. (See 01-10A-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3].) • Is the stopper pin mechanism normal?	Yes	Go to the next step.
		No	Replace the variable valve timing actuator, then go to Step 15.
14	**INSPECT ROTOR POSITION (LF, L3)** • Remove the variable valve timing actuator. (See 01-10A-34 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[LF, L3]) • Is the rotor position at the maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM NORMAL** **Note** • This DTC is detected as an intermittent concern. • The intermittent concern might be removed by cleaning the variable valve timing mode control function. Go to the next step.
		No	Replace the variable valve timing actuator, then go to the next step.
15	**VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Access the MAF PID using the M-MDS. **Note** • The MAF PID should indicate **1.95 g/s {0.25 lb/min.} or above** during this test • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0401[LF, L3]

id0102a3815300

DTC P0401	EGR flow insufficient detected
DETECTION CONDITION	• The PCM monitors difference in intake manifold pressures when EGR is operated and when it is stopped. If the difference is too small, PCM determines that EGR flow insufficient. **Diagnostic support note** • This is an intermittent monitor (EGR system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • MAP sensor malfunction • EGR gasket malfunction • PCM malfunction

Diagnostic procedure

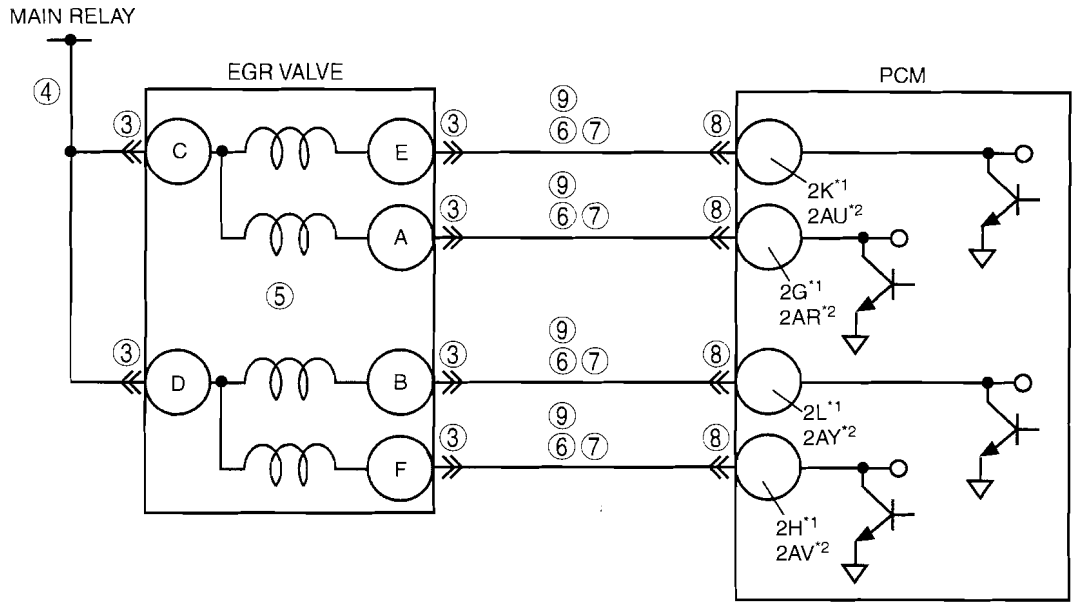
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EGR system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR OTHER DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to the next step.
4	**INSPECT VACUUM HOSE CONDITION** • Inspect vacuum hoses for clogs, any damages, frozen, or vacuum leakage. • Is there any malfunction?	Yes	Replace vacuum hoses, then go to Step 8.
		No	Go to the next step.
5	**INSPECT EGR VALVE MALFUNCTION** • Inspect the EGR valve. (See 01-16A-14 EGR VALVE INSPECTION[LF, L3].) • Is the EGR valve normal?	Yes	Go to the next step.
		No	Replace the EGR valve, then go to Step 8.
6	**INSPECT MAP SENSOR MALFUNCTION** • Perform MAP sensor inspection. (See 01-40A-53 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[LF, L3].) • Is EGR valve normal?	Yes	Go to the next step.
		No	Replace MAP sensor, then go to Step 8.
7	**INSPECT EGR VALVE PASSAGE** • Turn the ignition switch off. • Remove the EGR valve. • Is gasket installation normal?	Yes	Go to the next step.
		No	Install gasket correctly, then go to the next step.
8	**MONITOR EGR SYSTEM BY DRIVE MODE** • Clear DTC from PCM memory using M-MDS. • Run PCM Adaptive Memory Procedure Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Stop vehicle and access ON BOARD READINESS TEST to inspect DRIVE MODE completion status. • Verify FUEL_EVAL and EGR_EVAL PIDs status. • Does FUEL_EVAL and EGR_EVAL PIDs change to Yes?	Yes	Go to the next step.
		No	Retry this step.
9	**VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Access DIAGNOSTIC MONITORING TEST RESULTS. (See 01-02A-14 ON-BOARD DIAGNOSTIC TEST[LF, L3].) • Verify TEST #10:31:83 (EGR pressure variation) value. • Is value within the specification?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0403[LF, L3]

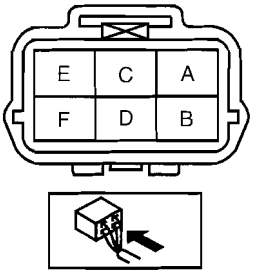
id0102a3807100

DTC P0403	EGR valve (stepper motor) circuit problem
DETECTION CONDITION	**California emission regulation applicable model** • The PCM monitors the EGR valve control signal voltage and current. If the following conditions are met, the PCM determines that there is the EGR control circuit problem. — The PCM turns the EGR valve off, but the voltage of the EGR valve control signal remains low. — The PCM turns the EGR valve on, but the current of the EGR valve control signal remains high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • The PCM monitors the input voltage from EGR valve. If voltage remain low or high, the PCM determines that the EGR valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between EGR valve terminal E and PCM terminal 2K*1, 2AU*2 • Short to power supply in wiring harness between EGR valve terminal A and PCM terminal 2G*1, 2AR*2 • Short to power supply in wiring harness between EGR valve terminal B and PCM terminal 2L*1, 2AY*2 • Short to power supply in wiring harness between EGR valve terminal F and PCM terminal 2H*1, 2AV*2 • Short to ground circuit in wiring harness between EGR valve terminal E and PCM terminal 2K*1, 2AU*2 • Short to ground circuit in wiring harness between EGR valve terminal A and PCM terminal 2G*1, 2AR*2 • Short to ground circuit in wiring harness between EGR valve terminal B and PCM terminal 2L*1, 2AY*2 • Short to ground circuit in wiring harness between EGR valve terminal F and PCM terminal 2H*1, 2AV*2 • Open circuit in wiring harness between EGR valve terminal E and PCM terminal 2K*1, 2AU*2 • Open circuit in wiring harness between EGR valve terminal A and PCM terminal 2G*1, 2AR*2 • Open circuit in wiring harness between EGR valve terminal B and PCM terminal 2L*1, 2AY*2 • Open circuit in wiring harness between EGR valve terminal F and PCM terminal 2H*1, 2AV*2 • Open circuit in wiring harness between main relay terminal D and EGR valve terminal C • Open circuit in wiring harness between main relay terminal D and EGR valve terminal D • PCM malfunction

DTC P0403	EGR valve (stepper motor) circuit problem



EGR VALVE
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF EGR VALVE** • Turn the ignition switch off. • Disconnect EGR valve connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminals and/or connector, then go to Step 10.
		No	Go to the next step.
4	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage following terminal and body ground. — EGR valve terminal C — EGR valve terminal D • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit then go to Step 10.

STEP	INSPECTION		ACTION
5	**INSPECT EGR VALVE** • Inspect the EGR valve. (See 01-16A-14 EGR VALVE INSPECTION[LF, L3].) • Is the EGR valve normal?	Yes	Go to the next step.
		No	Replace the EGR valve, then go to Step 10.
6	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity following terminal and body ground: — EGR valve terminal E — EGR valve terminal A — EGR valve terminal B — EGR valve terminal F • is there continuity?	Yes	Repair or replace wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage following terminal and body ground: — EGR valve terminal E — EGR valve terminal A — EGR valve terminal B — EGR valve terminal F • Is the voltage **B+**?	Yes	Repair or replace wiring harness for short to power supply, then go to Step 10.
		No	Go to the next step.
8	**INSPECT POOR CONNECTION OF PCM** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminals and/or connector, then go to Step 10.
		No	Go to the next step.
9	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Remove the PCM with the PCM connector connected. • Inspect for continuity following terminals: — Between EGR valve terminal E and PCM terminal 2K[*1], 2AU[*2] — Between EGR valve terminal A and PCM terminal 2G[*1], 2AR[*2] — Between EGR valve terminal B and PCM terminal 2L[*1], 2AY[*2] — Between EGR valve terminal F and PCM terminal 2H[*1], 2AV[*2] • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED** • Make sure to reconnect all disconnected connectors. Clear The DTC from the PCM memory using the M-MDS. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

[*1] : LF MTX, L3 and California emission regulation applicable model with LF ATX
[*2] : Except for California emission regulation applicable model with LF ATX

DTC P0421[LF, L3]

id0102a3807300

California Emission Regulation Applicable Model

DTC P0421	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM monitors the input voltage from the middle HO2S and the rear HO2S output current when the following conditions are met. If the input voltage change is extremely large compared to the output current change, the PCM determines that the catalyst system has deteriorated. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Calculated TWC temperature: **more than 350 °C {662 °F}** — Engine speed: **1,500—3,000 rpm (MTX), 1,350—3,000 rpm (ATX)** — LOAD: **19—56%** (at engine speed 2,000 rpm) — Time with purge control system does not operate: **more than 5 s** **Diagnostic support note** • This is an intermittent monitor (Catalyst). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • DIAGNOSTIC MONITORING TEST RESULTS is available. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TWC deterioration or malfunction • Exhaust gas leakage • Loose front HO2S • Loose middle HO2S • Loose rear HO2S • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Catalyst related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE** • Visually inspect exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 7.
		No	Go to the next step.
5	**INSPECT INSTALLATION OF MIDDLE AND REAR HO2S** • Inspect the middle and rear HO2S for looseness. • Is it normal?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 7. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)

STEP	INSPECTION		ACTION
6	**INSPECT TWC** • Clear the DTC using the M-MDS generic OBD function. • Turn the ignition switch off then back to the ON position. • Inspect the TWC. (See 01-16A-15 WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[LF, L3].) • Is it normal?	Yes	Replace the heated oxygen sensor, then go to the next step.
		No	Replace the TWC, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0421 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P0421	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM compares the number of front HO2S and rear HO2S inversions for a predetermined time. The PCM monitors the rear HO2S inversion ratio when the following conditions are met: The PCM detects inversion ratio. If the inversion ratio is below threshold, the PCM determine that catalyst system has deteriorated. — The front HO2S inversion ratio is as prescribed when the following monitoring conditions are met: — The accumulated occurrence time of the following monitoring conditions has exceeded the prescribed time limit: **MONITORING CONDITION** — Engine speed is **1,600—3,000 rpm**. — Calculated TWC temperature is **above 400 °C {752 °F}**. — Calculated load is **15—48%** (at engine speed **2,000 rpm**) **Diagnostic support note** • This is a intermittent monitor. (Catalyst) • The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • DIAGNOSTIC MONITORING TEST RESULTS is available. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TWC deterioration or malfunction • Exhaust gas leakage • Loose front HO2S • Loose rear HO2S • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Catalyst related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting.
		No	Go to the next step.
4	**INSPECT GAS LEAKAGE OF EXHAUST SYSTEM** • Visually inspect exhaust gas leakage in the exhaust system. • Is there gas leakage?	Yes	Repair or replace the malfunctioning exhaust part, then go to Step 7.
		No	Go to the next step.
5	**INSPECT INSTALLATION OF FRONT AND REAR OXYGEN SENSORS** • Inspect for looseness of front and rear oxygen sensors. • Is it normal?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 7.
6	**INSPECT TWC** • Clear the DTC using the M-MDS generic OBD function. • Turn the ignition switch off then back to the ON position. • Inspect the TWC. (See 01-16A-15 WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[LF, L3].) • Is it normal?	Yes	Replace the heated oxygen sensor, then go to the next step.
		No	Replace the TWC, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0421 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0441[LF, L3]

id0102a3041100

DTC P0441	Evaporative emission control system incorrect purge flow
DETECTION CONDITION	• PCM measures the purge line pressure, which is the vacuum when a following condition. If vacuum between charcoal canister and intake manifold does not reach the specified, PCM determines that the EVAP system has clogging. **MONITORING CONDITION** — Engine speed*1: **1,500—3,650 rpm [MT]/1,220—3,200 rpm [AT]** — Engine speed*2: **1,500—3,650 rpm [MT]/1,220—3,200 rpm [LF, AT]/1,220—3,800 rpm [L3, AT]** — Throttle opening angle: **19 %** (at engine speed is **2500 rpm**) — Vehicle speed: **70—136 km/h {43.4—84.5 mph} [MT]/35—136 km/h {21.7—84.5 mph} [AT]** **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Evaporative emission system leak detection pump malfunction • Charcoal canister malfunction • EVAP hose damaged or loose • EVAP pipe damaged • PCM malfunction

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is DTC P0443 present?	Yes	Go to the appropriate DTC inspection.
		No	Go to the next step.
4	**DETERMINE IF LEAK CONCERN OR BLOCKAGE CONCERN** • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is system test result failed?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT PURGE SOLENOID VALVE STUCK CLOSED** • Inspect the purge solenoid valve for stuck closed. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is the purge solenoid valve normal?	Yes	Inspect the following parts for clogging. • Vacuum hoses between intake manifold to charcoal canister • Catch tank • Charcoal canister Repair or replace the part, then go to Step 11.
		No	Replace the purge solenoid valve, then go to Step 11.

STEP	INSPECTION		ACTION
6	**LOCATE LEAK POINT** • Inspect the following for leakage using Ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to the next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed (red light turns on)?	Yes	Go to Step 9.
		No	Go to the next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed (red light turns on)?	Yes	Replace the EVAP system leak detection pump, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to the next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed (red light turns on)?	Yes	Leakage still exists. Locate leak point and repair. Then go to the next step.
		No	Go to the next step
11	**VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED** • Start the engine and let it idle. • Clear DTC using M-MDS. • Turn the ignition switch off. • Perform the KOER self-test or the "EVAP System Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is PENDING CODE of same DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0442[LF, L3]

id0102a3807500

DTC P0442	Evaporative emission control system leak detected (small leak)
DETECTION CONDITION	• The PCM measures the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference current value within the specified period, PCM determines that the EVAP system has small leak. **MONITORING CONDITION** — The ignition switch is turned off. — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Fuel filler cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

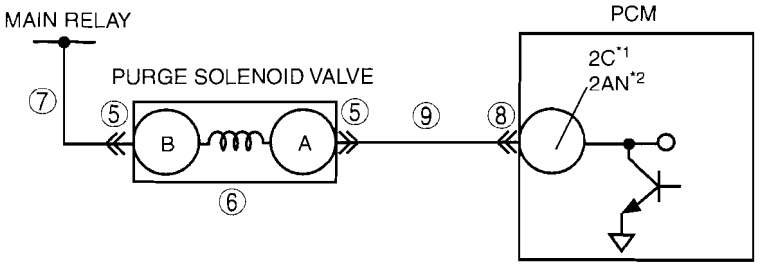
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Is other DTC present?	Yes	Go to the appropriate DTC inspection.
		No	Go to the next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is system test result failed?	Yes	Go to the next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
5	**LOCATE LEAK POINT** • Inspect leakage for the following using Evaporative Emissions Tester — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT PURGE SOLENOID VALVE** • Inspect the purge solenoid valve is stuck closed. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Go to Step 9.
		No	Go to the next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Replace the EVAP system leak detection pump, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace fuel tank or sealing, then go to the next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Leakage still exists. Locate leak point and repair. Then go to the next step.
		No	Go to the next step
11	**VERIFY TROUBLESHOOTING OF DTC P0442 COMPLETED** • Start the engine and let it idle. • Clear DTC using M-MDS. • Turn the ignition switch off. • Perform the KOER self-test or the "EVAP System Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is PENDING CODE of same DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

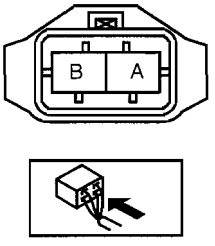
DTC P0443[LF, L3]

id0102a3807600

DTC P0443	Purge solenoid valve circuit problem
DETECTION CONDITION	**California emission regulation applicable model** • The PCM monitors the purge solenoid valve control signal voltage and current. If the following conditions are met, the PCM determines that there is the purge solenoid valve control circuit problem. — The PCM turns the purge solenoid valve off, but the voltage of the purge solenoid valve control signal remains low. — The PCM turns the purge solenoid valve on, but the current of the purge solenoid valve control signal remains high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • The PCM monitors the input voltages from the purge solenoid valve. If the voltage remains low or high, the PCM determines that the purge solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to ground in wiring harness between purge solenoid valve terminal A and PCM terminal 2C*1, 2AN*2 • Open circuit in wiring harness between main relay and purge solenoid valve terminal B • Open circuit in wiring harness between purge solenoid valve terminal A and PCM terminal 2C*1, 2AN*2 • Short to power supply in wiring harness between purge solenoid valve terminal A and PCM terminal 2C*1, 2AN*2 • PCM malfunction

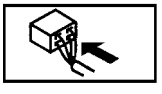


PURGE SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect purge solenoid valve tube that is connected to intake manifold. • Connect vacuum pump to purge solenoid valve. • Pump vacuum pump several times and stop. • Wait **a few seconds**. • Is vacuum maintained?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn the ignition switch off. • Disconnect purge solenoid valve connector. • Pump vacuum pump several times and wait **a few seconds**. • Is vacuum maintained?	Yes	Repair or replace wiring harness for short to ground, then go to Step 10.
		No	Replace the purge solenoid valve, then go to Step 10.
5	**INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT PURGE SOLENOID VALVE** • Perform purge solenoid valve inspection. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 10.
7	**INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between purge solenoid valve terminal B and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between purge solenoid valve terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Inspect for continuity between purge solenoid valve terminal A (wiring harness-side) and PCM terminal 2C[*1], 2AN[*2] (wiring harness-side). • If there is continuity, go to the next step. • If there is no continuity, repair or replace wiring harness for open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0446[LF, L3]

id0102a3807700

DTC P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When the decrease in pump load current is less than the specification after the reference current value has been obtained, the PCM determines change over valve (COV) in EVAP system leak detection pump has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Damaged COV (in EVAP system leak detection pump.) • Short to power circuit between the EVAP system leak detection pump terminal C and PCM terminal 1AJ • Damaged PCM

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to the next step.
		No	Go to the next step.
3	**CHECK COV CONTROL (EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER)** • Turn the ignition switch to the ON position (Engine off). • Disconnect the EVAP system leak detection pump connector. • Measure the voltage between EVAP system leak detection pump connector terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness, then go to Step 5.
		No	Go to the next step.
4	**INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)** • Inspect the EVAP system leak detection pump. (See 01-16A-10 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3].) • Is the COV (EVAP system leak detection pump) normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off) • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative emission test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0455[LF, L3]

id0102a3815500

DTC P0455	Evaporative emission control system leak detected (gross leak)
DETECTION CONDITION	• The PCM measures the pump load current (EVAP line pressure) when the specified period has passed after EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference current value within the specified period, PCM determines that the EVAP system has gross leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid vaive malfunction • EVAP system leak detection pump malfunction • Loose, missing or defective fuel filler cap • Charcoal canister malfunction • Fuel tank malfunction • EVAP hose damaged or loose • Poor connection or damaged vacuum hose

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to off then to the ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Is DTCs P0443 and/or P0446 present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to the next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform Evaporative System Leak Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Go to the next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
5	**INSPECT FUEL FILLER CAP** • Verify the fuel-filler cap is not either disconnected, loose or damaged. • Is it normal? **Note** • When the fuel-filler caps other than OEM caps are attached, it is considered malfunction.	Yes	Go to the next step.
		No	Retighten the fuel-filler cap or replace it, if it is damaged. Go to Step 18.
6	**INSPECT PURGE SOLENOID VALVE FOR BEING STUCK** • Inspect the purge solenoid valve. • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 18.
7	**INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)** • Inspect the EVAP system leak detection pump. • Is the COV (EVAP leak detection pump) normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to Step 18.
8	**DETERMINE IF EVAP CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE** **Note** • If evaporative emission tester is not available, then go to the next step. • Perform Evaporative System Leak Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is system test normal?	Yes	Repair or replace malfunctioning area, then go to Step 18.
		No	Go to the next step.
9	**INSPECT LEAKAGE OF CHARCOAL CANISTER TO FUEL PUMP** • Disconnect the fuel tank side vacuum hose at charcoal canister. • Apply vacuum **1.7 kPa {13 mmHg, 0.5 inHg}** to disconnected vacuum hose using vacuum pump. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 13.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify vacuum hose installation condition between fuel tank and charcoal canister. • Is there poor connection detected?	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to the next step
11	**INSPECT FUEL TANK INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed fuel pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace fuel tank or sealing, then go to Step 18.
12	**INSPECT FUEL TANK** • Inspect the fuel tank. • Is it normal?	Yes	Replace vacuum hose from charcoal canister and fuel tank, then go to the next step.
		No	Replace the fuel tank, then go to the next step.
13	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE** • Disconnect purge solenoid valve side vacuum hose at charcoal canister. • Apply vacuum **3.3 kPa {25 mmHg, 1.0 inHg}** to disconnected vacuum hose using vacuum pump. • Does vacuum hold for minimum of **2 min**?	Yes	Go to Step 18.
		No	Go to the next step.
14	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify vacuum hose installation condition between purge solenoid valve and charcoal canister. • Is there poor connection detected?	Yes	Connect vacuum hose correctly, then go to Step 18.
		No	Go to the next step.
15	**INSPECT PURGE SOLENOID VALVE FOR DAMAGE OR AIR LEAK** • Remove the purge solenoid valve and inspect for damage and air leak. • Is it normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step18.
16	**INSPECT CATCH TANK** • Remove the catch tank and inspect for plugging, damages and pinhole using vacuum pump. • Is it normal?	Yes	Go to the next step.
		No	Replace the catch tank, then go to Step 18.
17	**INSPECT CHARCOAL CANISTER** • Remove the charcoal canister and inspect for plugging, damage and pinhole. • Is it normal?	Yes	Replace vacuum hose from the charcoal canister to the purge solenoid valve, then go to the next step.
		No	Replace the charcoal canister, then go to the next step.
18	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors. • Perform Evaporative System Leak Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Leakage still exists. Locate leak point and repair. Then go to the next step.
		No	Go to the next step.
19	**VERIFY TROUBLESHOOTING OF DTC P0455 COMPLETED** • Start the engine and let it idle. • Clear DTC using M-MDS. • Turn the ignition switch off. • Perform the KOER self-test or the "EVAP System Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is PENDING CODE of same DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
20	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0456[LF, L3]

id0102a3807900

DTC P0456	Evaporative emission control system leak detected (very small leak)
DETECTION CONDITION	• The PCM measure the pump load current (EVAP line pressure) when a specified period has passed after EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference load value or rate of the load increase lower than the specified within a specified period, PCM determines that the EVAP system has very small leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or above** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Fuel cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn ignition switch OFF then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • Is other DTC present?	Yes	Go to appropriate DTC inspection.
		No	Go to next step
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is system test result failed?	Yes	Go to next step.
		No	Intermittent concern exists. Inspect purge solenoid valve and EVAP system leak detection pump circuit for intermittent concern. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
5	**LOCATE LEAK POINT** • Check leakage for the following using. Evaporative emission Tester — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace part, then go to Step 10.
		No	Go to next step.

STEP	INSPECTION		ACTION
6	**INSPECT PURGE SOLENOID VALVE** • Inspect if purge solenoid valve is stuck closed. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place clamp on EVAP system leak detection pump hose between EVAP system leak detection pump and air filter. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Go to Step 9.
		No	Go to next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove clamp. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Replace EVAP system leak detection pump, then go to Step 10.
		No	Go to next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed pump unit. • Is it okay?	Yes	Go to next step.
		No	Repair or replace fuel tank or sealing, then go to next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform evaporative system leak inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is test result failed?	Yes	Leakage still exists. Locate leak point and repair. Then go to next step.
		No	Go to next step
11	**VERIFY TROUBLESHOOTING OF DTC P0456 COMPLETED** • Start the engine and let it idle. • Clear DTC using M-MDS. • Turn the ignition switch off. • Perform the KOER self-test or the "EVAP System Repair Verification Drive Mode". (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is PENDING CODE of same DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0461[LF, L3]

id0102a3808000

DTC P0461	Fuel gauge sender unit circuit range/performance problem
DETECTION CONDITION	• The PCM monitors the fuel tank level difference before and after the PCM-calculated fuel consumption has reached **more than 24.5 L {25.9 US qt, 21.6 Imp qt}**. If the difference is **less than 5%**, the PCM determines that there is a fuel gauge sender unit circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Replace the fuel tank, then go to the next step. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
		No	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0462[LF, L3]

id0102a3808100

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage that is too low, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Replace the fuel tank, then go to the next step. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Drive the vehicle under the FREEZE FRAME DATA condition. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0463[LF, L3]

id0102a3808200

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage that is too high, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction

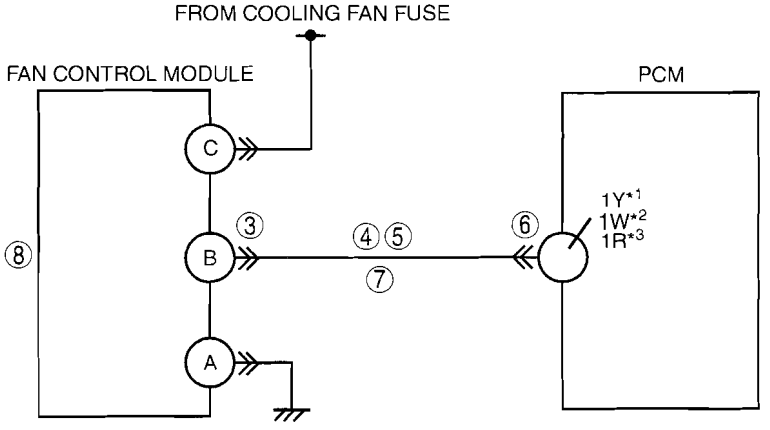
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER** • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE". (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Replace the fuel tank, then go to the next step. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle under the FREEZE FRAME DATA condition. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

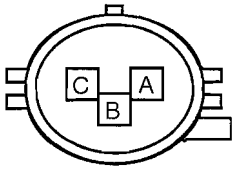
DTC P0480[LF, L3]

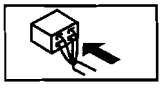
id0102a3807400

DTC P0480	Fan control circuit problem
DETECTION CONDITION	• The PCM monitors the input voltages from the fan control module. If the voltage at PCM terminal 1W remains low or high, the PCM determines that fan control circuit has malfunction. **Diagnostic support note** • This is an continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fan control module malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between fan control module terminal B and PCM terminal 1Y*1, 1W*2, 1R*3 • Short to ground in wiring harness between fan control module terminal B and PCM terminal 1Y*1, 1W*2, 1R*3 • Open circuit in wiring harness between fan control module terminal B and PCM terminal 1Y*1, 1W*2, 1R*3 • PCM malfunction



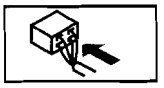
FAN CONTROL MODULE
WIRING HARNESS-SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FAN CONTROL MODULE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect fan control module connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between fan control module terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 9.
		No	Go to the next step.
5	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between fan control module terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FAN CONTROL MODULE SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between fan control module terminal B (wiring harness-side) and PCM terminal 1Y*1, 1W*2, 1R*3. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 9.
8	**INSPECT FAN CONTROL MODULE** • Perform fan control module inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is fan control module normal?	Yes	Go to the next step.
		No	Replace the fan control module, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED** • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. • Turn A/C switch to ON. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

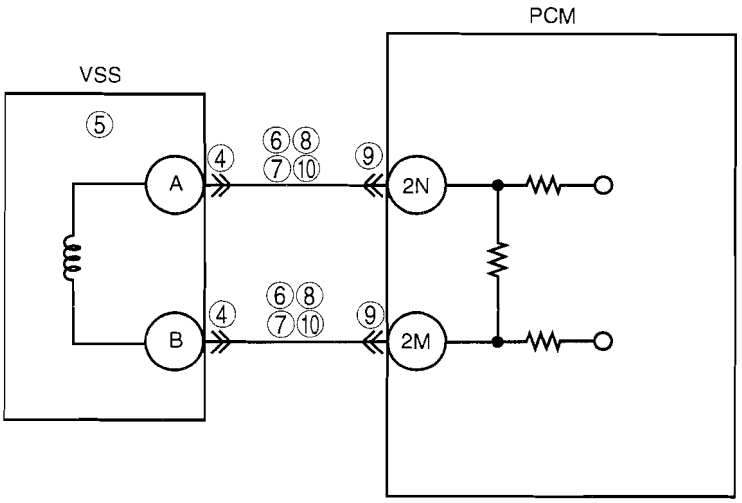
DTC P0500[LF, L3]

id0102a3808400

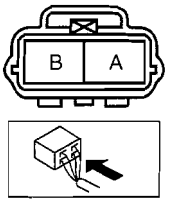
DTC P0500	VSS circuit problem
DETECTION CONDITION	**With ABS HU/CM** • If an error in the wheel speed signal from the ABS HU/CM is detected by CAN when the following conditions are met: — Shift range in except P, N or R range (ATX) — Neutral switch and clutch switch are OFF (MTX) — Load is above **40%** — Engine speed is **2,000 rpm or above** — Brake switch is OFF **Without ABS HU/CM MTX** • Vehicle speed signal from vehicle speed sensor is **below 3.7 km/h {2.3 mph}** when following conditions are met: — Neutral switch and clutch switch are OFF — Load is above **40%** — Engine speed is **2,000 rpm or above** — Brake switch is OFF **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	**With ABS HU/CM** • Front ABS wheel-speed sensor malfunction • ABS HU/CM malfunction • Connector or terminal malfunction • PCM malfunction **Without ABS HU/CM MTX** • VSS malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2N and VSS terminal A • Open circuit between PCM terminal 2M and VSS terminal B • Short to ground between PCM terminal 2N and VSS terminal A • Short to ground between PCM terminal 2M and VSS terminal B • Short to power between PCM terminal 2N and VSS terminal A • Short to power between PCM terminal 2M and VSS terminal B • PCM malfunction

DTC P0500	VSS circuit problem

WITHOUT ABS HU/CM MTX

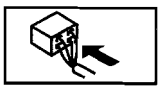


VSS
WIRING HARNESS-SIDE
CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME PID DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT** • Connect the M-MDS to DLC-2. • Start the engine. • Access VSS PID using the M-MDS. — Vehicle speed **20 km/h {12.4 mph}: 20km/h {12.4 mph}** — Vehicle speed **40 km/h {24.8 mph}: 40km/h {24.8 mph}** • Are PID readings within specification?	Yes	Go to intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Verify that the VSS connector is connected securely. • Is connector normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 11.

STEP	INSPECTION		ACTION
5	**INSPECT THE VSS** • Perform VSS inspection. (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL], 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].) • Is the VSS normal?	Yes	Go to the next step.
		No	Replace VSS, then go to Step 11.
6	**INSPECT VSS CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch off. • Disconnect the VSS connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage following terminals: — VSS terminal A (wiring harness-side) — VSS terminal B (wiring harness-side) • Is any voltage reading?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to the next step.
7	**INSPECT VSS CIRCUIT FOR SHORT TO GROUND** • Inspect continuity between following terminal and body ground: — VSS terminal A (wiring harness-side) — VSS terminal B (wiring harness-side) • Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to the next step.
8	**INSPECT VSS CIRCUITS FOR SHORTS** • Inspect continuity between the VSS connector terminals A and B (wiring harness-side). • Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to the next step.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to the next step.
10	**INSPECT VSS CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between following terminals (wiring harness-side): — VSS terminal A and PCM terminal 2N — VSS terminal B and PCM terminal 2M • Is there continuity?	Yes	Inspect VSS pulse wheel for damage. Replace VSS pulse wheel and go to the next step.
		No	Repair or replace suspected harness, then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear DTC from PCM memory using M-MDS. • Warm up the engine. • Access RPM and LOAD PID using M-MDS. • Drive vehicle under following conditions for **18s**. — Engine speed: **2,000 rpm or above** — Gear: Gear is in other than NEUTRAL — Load: **40% or above** • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0505[LF, L3]

id0102a3808500

DTC P0505	IAC system problem
DETECTION CONDITION	• The PCM cannot control idle speed toward target idle speed while KOER self test.
POSSIBLE CAUSE	• Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator control circuit malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off then to the ON position. (Engine off) • Verify pending code or stored DTCs using the M-MDS. • Does DTC P0506, P0507, P0638, P2100*2, P2101, P2102*2, P2103*2, P2108, P2109*1, P2112*1 or P2119 presents?	Yes	Perform the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
3	**INSPECT A/C MAGNETIC CLUTCH OPERATION** **Note** • The following test should be performed for the A/C. Go to the next step for vehicles without A/C • Turn the fan switch off. • Is the magnetic clutch still on?	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY." of ENGINE SYMPTOM TROUBLESHOOTING then go to Step 8. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION** • Apply electrical load. • Is the engine speed increased?	Yes	Go to the next step.
		No	Repair short to power supply in generator control circuit, then go to Step 8.
5	**INSPECT AIR CLEANER ELEMENT** • Remove air cleaner element with the engine running. Is the engine speed increased?	Yes	Clean or replace the air cleaner element, then go to Step 8.
		No	Go to the next step.
6	**INSPECT THROTTLE BODY PASSAGE** • Is the throttle body clogged?	Yes	Clean or replace the throttle body passage, then go to Step 8.
		No	Go to the next step.
7	**INSPECT ENGINE COMPRESSION** • Inspect engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC using the M-MDS. • Perform the KOER Self-Test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

DTC P0506[LF, L3]

id0102a3808600

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **14 s**, when brake pedal is depressed (brake switch is on). **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below -10 °C {14 °F}**, the PCM cancels diagnosis of P0506. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator malfunction • Purge solenoid valve malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify PENDING CODE or stored DTCs using M-MDS. • Is other DTC present?	Yes	Repair the applicable DTCs. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**INSPECT A/C MAGNET CLUTCH OPERATION** • Turn the fan switch off. • Is the magnet clutch still on?	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 9. (See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].)
		No	Go to the next step.
5	**INSPECT PURGE SOLENOID VALVE MALFUNCTION** • Inspect the purge solenoid valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 9.
6	**INSPECT AIR CLEANER ELEMENT** • Remove the air cleaner element with the engine running. • Is the engine speed increased?	Yes	Replace the air cleaner element, then go to Step 9.
		No	Go to the next step.
7	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is the engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 9.

STEP	INSPECTION		ACTION
8	**INSPECT GENERATOR** • Inspect the generator. (See 01-17A-7 GENERATOR INSPECTION[LF, L3].) • Is the generator normal?	Yes	Go to the next step.
		No	Repair or replace the related part, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Depress the brake pedal for **14 s or more.** • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0507[LF, L3]

id0102a3808700

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	• Actual idle speed is higher than expected by **200 rpm** for **14 s**, when the brake pedal is depressed (brake switch is on). **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below -10 °C {14 °F}**, the PCM cancels diagnosis of P0507. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Vacuum hose misconnection • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, then go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify PENDING CODE or stored DTCs using the M-MDS. • Is other DTC present?	Yes	Repair the applicable DTCs. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**INSPECT VACUUM HOSE CONNECTION** • Are vacuum hoses connecting accurately? (See 01-13A-4 INTAKE AIR SYSTEM MANIFOLD VACUUM INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Reconnect vacuum hose accurately, then go to Step 5.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Depress the brake pedal for **14 s or more.** • Is the PENDING CODE for this DTC present?	Yes	Replace this PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P050A[LF, L3]

id0102a3800000

DTC P050A	Cold start idle air control system performance
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **8.4 s** when the target idle speed correction value for cold start is **above 0 rpm** or ignition retard value is **above 8.9 deg.CA**. **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below -10 °C {14 °F}**, the PCM cancels diagnosis of P050A. **Diagnostic support note** • This is an intermittent monitor (Cold start emission reduction strategy monitoring). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Throttle valve stuck or blockage • Air suction in intake air system • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and diagnostic monitoring test results on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is P050A on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See01-02A-22 DTC TABLE[LF, L3].)
4	**CHECK AIR SUCTION IN INTAKE AIR SYSTEM** • Start the engine. • Check air suction between MAF sensor and intake manifold. • Is there any air suction in the intake air system?	Yes	Repair or replace malfunctioning part, then go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION** • Perform the Electronic Throttle Control System Operation Inspection. (See01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3], Electronic Throttle Control System Inspection.) • Does the electronic throttle control system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result. Then go to Step 7.
6	**VERIFY THROTTLE VALVE** • Turn the ignition switch off. • Remove the throttle valve with connector connected. • Access ETC_DSD PID using the M-MDS. • Turn the ignition switch to ON position (Engine off). • Move the throttle valve using the ETC_DSD PID simulation function. • Dose the throttle valve move smoothly?	Yes	Go to the next step.
		No	Clean the throttle valve and retest. If the problem does not resolve, replace the throttle body. Then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P050A COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from the PCM memory using the M-MDS. • Perform the KOER self-test using the M-MDS. (See01-02A-22 DTC TABLE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTC present?	Yes	Go to the applicable DTC troubleshooting.(See01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.

DTC P050B[LF, L3]

id0102a3799900

DTC P050B	Cold start ignition timing performance
DETECTION CONDITION	• The PCM monitors actual ignition timing using the CKP sensor while electronic spark advance control fast idle correction operating. If the ignition timing is out of specified range, the PCM determines that the ignition timing at cold condition has performance problem. **Diagnostic support note** • This is an intermittent monitor (Cold start emission reduction strategy monitoring). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Damaged CKP sensor • Damaged CMP sensor • Damaged or chipped CKP sensor pulse wheel • Damaged or chipped CMP sensor pulse wheel • PCM malfunction

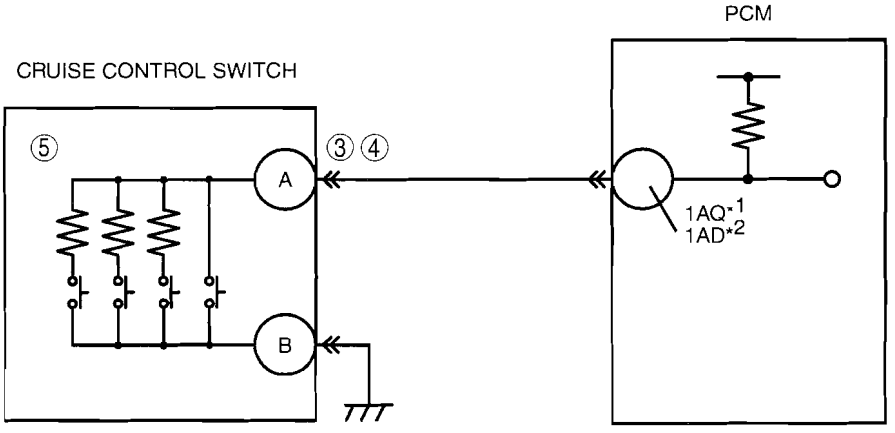
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and diagnostic monitoring test results on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is P050B on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See01-02A-22 DTC TABLE[LF, L3].)
4	**VISUALLY INSPECT CKP SENSOR AND PULSE WHEEL** • Visually inspect for CKP sensor and pulse wheel. • Is there any damage or chip on CKP sensor and pulse wheel?	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
5	**INSPECT CKP SENSOR** • Inspect CKP sensor. (See01-40A-68 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3].) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 8.
6	**VISUALLY INSPECT CMP SENSOR AND PULSE WHEEL** • Visually inspect for CMP sensor and pulse wheel. • Is there any damage or chip on CMP sensor and pulse wheel?	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
7	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].) • Is the CMP sensor normal?	Yes	Go to the next step.
		No	Replace the CMP sensor, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P050B COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from the PCM memory using the M-MDS. • Perform the KOER self-test using the M-MDS. (See01-02A-22 DTC TABLE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTC present?	Yes	Go to the applicable DTC troubleshooting. (See01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

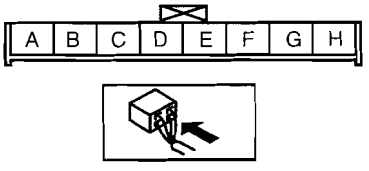
DTC P0564[LF, L3]

id0102a3808900

DTC P0564	Cruise control switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the cruise control switch signal at PCM terminal 1AQ*1, 1AD*2, 1AQ*3. If the PCM detects that any one of following switches (Main, CANCEL, SET/COAST, RESUME/ACCEL) remains on for **2 min**, the PCM determines that the cruise control switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Cruise control switch malfunction • Connector or terminal malfunction • Short to power circuit in wiring from cruise control switch terminal A and PCM terminal 1AQ*1, 1AD*2 • Short to ground circuit in wiring from cruise control switch terminal A and PCM terminal 1AQ*1, 1AD*2 • PCM malfunction

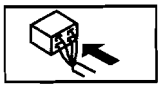


CRUISE CONTROL SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.

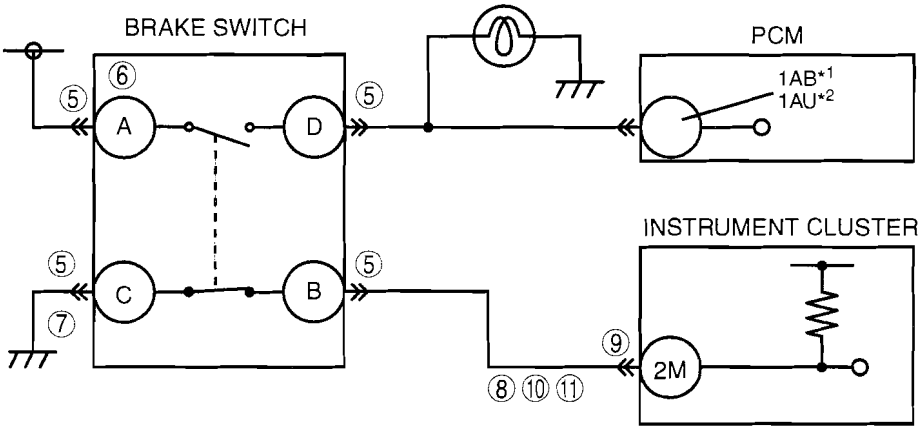
STEP	INSPECTION		ACTION
2	**INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
3	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect cruise control switch and PCM connectors. • Inspect for continuity between cruise control switch terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace short to ground, then go to Step 6.
		No	Go to the next step.
4	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Inspect the voltage between cruise control switch terminal A (wiring harness-side) and body ground. • Is the voltage **below 1.0 V**?	Yes	Go to the next step.
		No	Repair or replace short to power supply, then go to Step 6.
5	**INSPECT CRUISE CONTROL SWITCH OPERATION** • Inspect the cruise control switch. (See 01-20A-1 CRUISE CONTROL SWITCH INSPECTION[LF, L3].) • Is the cruise control switch normal?	Yes	Go to the next step.
		No	Replace the cruise control switch, then go to the next step.
6	**VERIFY TROUBLESHOOTING OF P0564 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle with cruise control **2 min. or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0571[LF, L3]

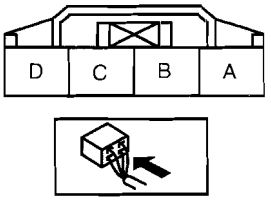
id0102a3809000

DTC P0571	Brake switch circuit problem
DETECTION CONDITION	• The PCM monitors changes in input voltage for brake switch No.1 and No.2 (signal from instrument cluster). If the PCM detects that both brake switches No.1 and No.2 remain on or off for **15 s**, it determines that the brake switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Open circuit between brake switch terminal B and instrument cluster terminal 2M • Open circuit between brake switch terminal C and body ground • Short to power between brake switch terminal B and instrument cluster terminal 2M • Short to ground circuit between brake switch terminal B and instrument cluster terminal 2M • Communication error between PCM and instrument cluster • PCM malfunction

DTC P0571	Brake switch circuit problem



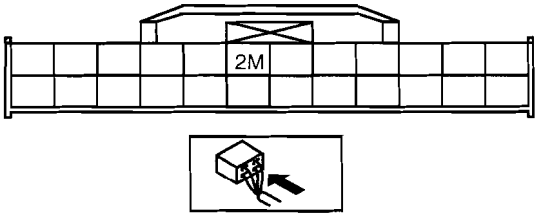
BRAKE SWITCH
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

INSTRUMENT CLUSTER
WIRING HARNESS-SIDE CONNECTOR



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY DTC FOR MODULE COMMUNICATION** • Connect M-MDS to DLC-2. • Turn the ignition switch to the ON position (Engine off). • Verify stored DTC. • Is DTC U0155 stored?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0703 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
5	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
6	**INSPECT BRAKE SWITCH** • Inspect the brake switch. • Is the brake switch normal?	Yes	Go to the next step.
		No	Replace brake switch, then go to Step 11.
7	**INSPECT GROUND CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 11.
8	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO GROUND** • Inspect for continuity between brake switch terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground circuit, then go to Step 11.
		No	Go to the next step.
9	**INSPECT INSTRUMENT CLUSTER CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect instrument cluster connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
10	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal B (wiring harness-side) and instrument cluster terminal 2M (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 11.
11	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between brake switch terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power circuit, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF P0571 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off). • Depress and release the brake pedal **more than 5 times**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0601[LF, L3]

id0102a3809100

DTC P0601	PCM memory check sum error
DETECTION CONDITION	• The PCM internal memory check sum error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal memory malfunction • PCM internal CPU malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0601 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0602[LF, L3]

id0102a3809200

DTC P0602	PCM programming error
DETECTION CONDITION	• No configuration data in the PCM **Note** • If the "PCM CONFIGURATION" is successful, the PCM stores DTC P0602 and illuminates the MIL (system is normal). Clear DTC P0602 using the M-MDS after the "PCM CONFIGURATION". • The MIL goes out after three drive cycles with no failure (DTCs remain in PCM). **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Configuration has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0604[LF, L3]

id0102a3809300

DTC P0604	PCM random access memory error
DETECTION CONDITION	• The PCM internal random access memory error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal RAM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0604 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P0606[LF, L3]

id0102a3809400

DTC P0606	ECM/PCM processor
DETECTION CONDITION	• The PCM internal CPU malfunction **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal CPU malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0606 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0607[LF, L3]

id0102a3809500

Except for California Emission Regulation Applicable Model

DTC P0607	PCM performance problem
DETECTION CONDITION	• The PCM internal malfunction **Diagnostic support note** • This is a continuous monitor (Other). • MIL does not comes on. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0607 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from PCM memory using M-MDS. • Start the engine, or perform the KOEO or KOER self-test • Is same DTC present?	Yes	Replace PCM, go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0610[LF, L3]

id0102a3809600

DTC P0610	PCM vehicle options error
DETECTION CONDITION	• The PCM data configuration error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Configuration procedure has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0638[LF, L3]

id0102a3809800

DTC P0638	Throttle actuator control circuit range/performance problem
DETECTION CONDITION	• The PCM compares the actual TP with the target TP when the engine is running. If the difference is more than the specification, the PCM determines that there is a throttle actuator control circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

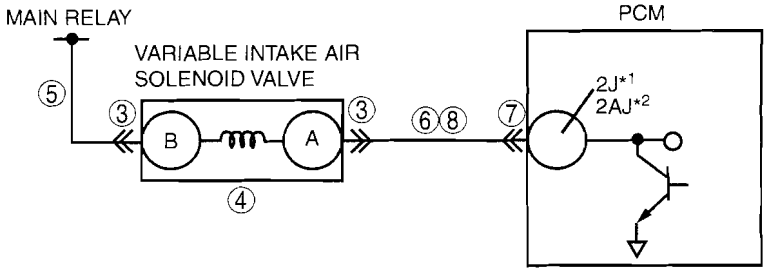
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF P0638 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

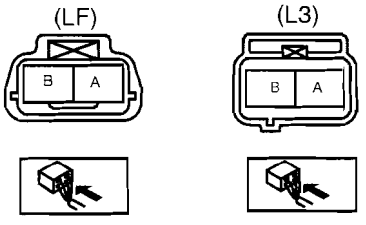
DTC P0661[LF, L3]

id0102a3821700

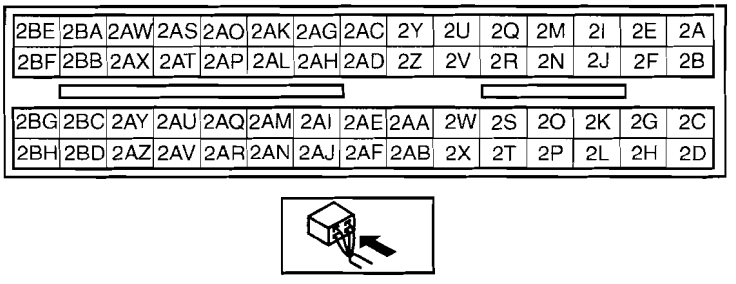
DTC P0661	Variable intake air solenoid valve circuit low input
DETECTION CONDITION	• The PCM monitors the variable intake air solenoid valve control signal. If the PCM turns variable intake air solenoid valve off but voltage still remains low, the PCM determines that variable intake air solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • The FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Variable intake air solenoid valve malfunction • Open circuit in wiring harness between main relay and variable intake air solenoid valve terminal B • Open circuit in wiring harness between variable intake air solenoid valve terminal A and PCM terminal 2J*1, 2AJ*2 • Short to ground in wiring harness between variable intake air solenoid valve terminal A and PCM terminal 2J*1, 2AJ*2 • Connector or terminal malfunction • PCM malfunction



VARIABLE INTAKE AIR SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

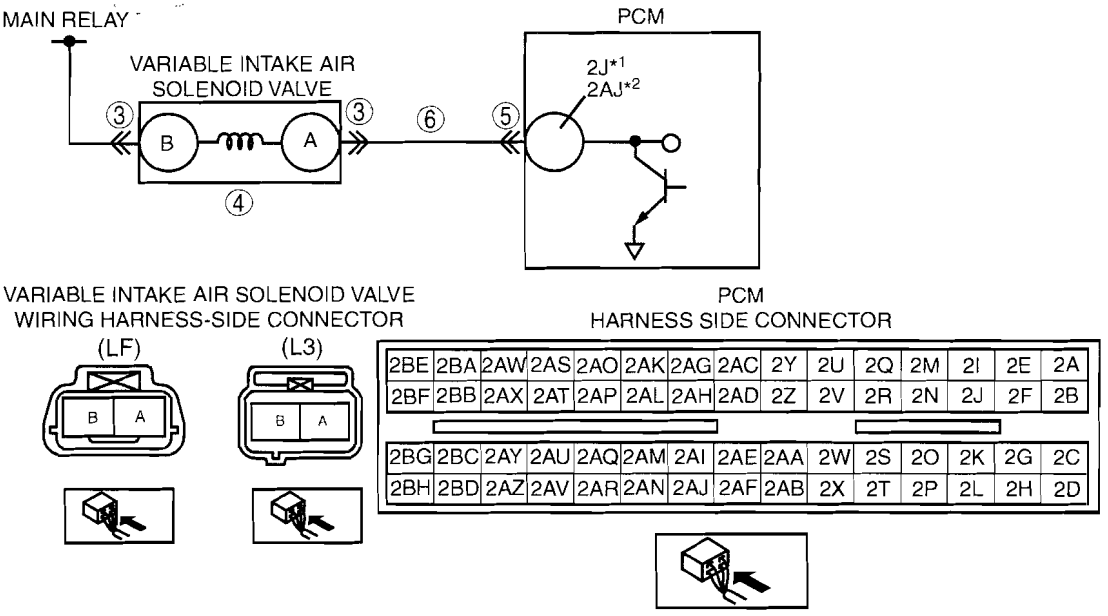
STEP	INSPECTION		ACTION
3	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the variable intake-air solenoid valve connector. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE MALFUNCTION** • Inspect the variable intake air solenoid valve. (See 01-13A-8 VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION[LF, L3].) • Is the variable intake air solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable intake air solenoid valve, then go to Step 9.
5	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between variable intake air solenoid valve terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open, then go to Step 9.
6	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between variable intake air solenoid valve terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminal 2J*1, 2AJ*2 (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT FOR OPEN** • Inspect for continuity between variable intake air solenoid valve terminal A (wiring harness-side) and PCM terminal 2J*1, 2AJ*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0661 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. — Access RPM PID. — Increase the engine speed **4,750 rpm or more** for **10 times**. • Perform the KOEO or KOER self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0662[LF, L3]

id0102a3821800

DTC P0662	Variable intake air solenoid valve circuit high input
DETECTION CONDITION	• The PCM monitors the variable intake air solenoid valve control signal. If the PCM turns variable intake air solenoid valve on but voltage at PCM terminal still remains high, the PCM determines that the variable intake air solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Variable intake air solenoid valve malfunction • Short to power supply in wiring harness between variable intake air solenoid valve terminal A and PCM terminal 2J*1, 2AJ*2 • Shorted variable intake air solenoid valve or PCM connector • PCM malfunction



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the variable intake air solenoid valve connector. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.

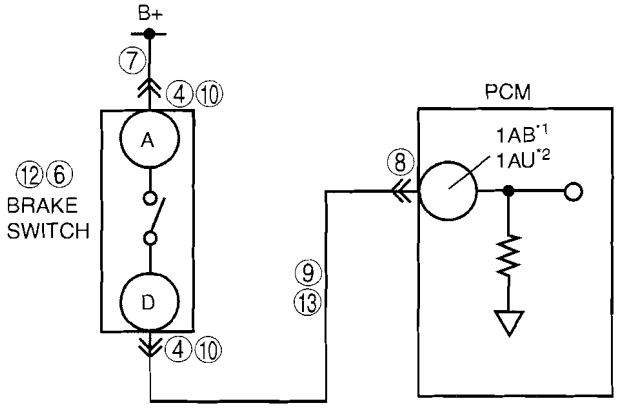
STEP	INSPECTION		ACTION
4	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE MALFUNCTION** • Inspect the variable intake air solenoid valve. (See 01-13A-8 VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION[LF, L3].) • Is the variable intake air solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable intake air solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at terminal 2J*1, 2AJ*2 (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between variable intake air solenoid valve terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0662 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. — Access RPM PID. — Increase the engine speed **4,750 rpm or more** for **10 times**. • Perform the KOEO or KOER self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

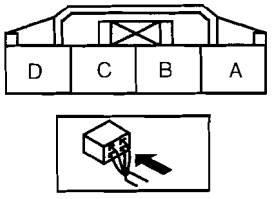
DTC P0703[LF, L3]

id0102a3809900

DTC P0703	Brake switch input circuit problem
DETECTION CONDITION	• The PCM monitors changes in input voltage from the brake switch. If the PCM does not detect the voltage changes while alternately accelerating and decelerating **8 times**, the PCM determines that brake switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Poor connection of brake switch connector or PCM connector • Short to power supply in wiring harness between brake switch terminal D and PCM connector terminal 1AB*1, 1AU*2 • Open circuit in wiring harness between brake switch terminal D and PCM connector terminal 1AB*1, 1AU*2 • Open circuit in wiring harness between battery positive terminal and brake switch terminal A • PCM malfunction



BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to DLC-2. • Access BOO PID. • Verify BOO PID during brake pedal operation. • Is BOO PID always OFF?	Yes	Go to the next step.
		No	Go to Step 10.
4	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect the M-MDS to DLC-2. • Access BOO PID. • Connect a jumper wire between brake switch terminal A and D. • Is BOO PID on?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT BRAKE SWITCH** • Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to Step 14.
		No	Replace the brake switch, then go to Step 14.
7	**INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT** • Measure the voltage between brake switch terminal A and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the brake switch power circuit for open, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal D and PCM terminal 1AB*1, 1AU*2. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
11	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect the M-MDS to DLC-2. • Access BOO PID. • Verify that BOO PID changes from ON to OFF when the brake switch connector disconnected. • Does BOO PID change from ON to OFF?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT BRAKE SWITCH** • Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to Step 14.
		No	Replace the brake switch, then go to Step 14.
13	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure the voltage between brake switch terminal D and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle **30 km/h {18.6 mph} or more**. • Depress and release the brake pedal **more than 8 times** while driving vehicle. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

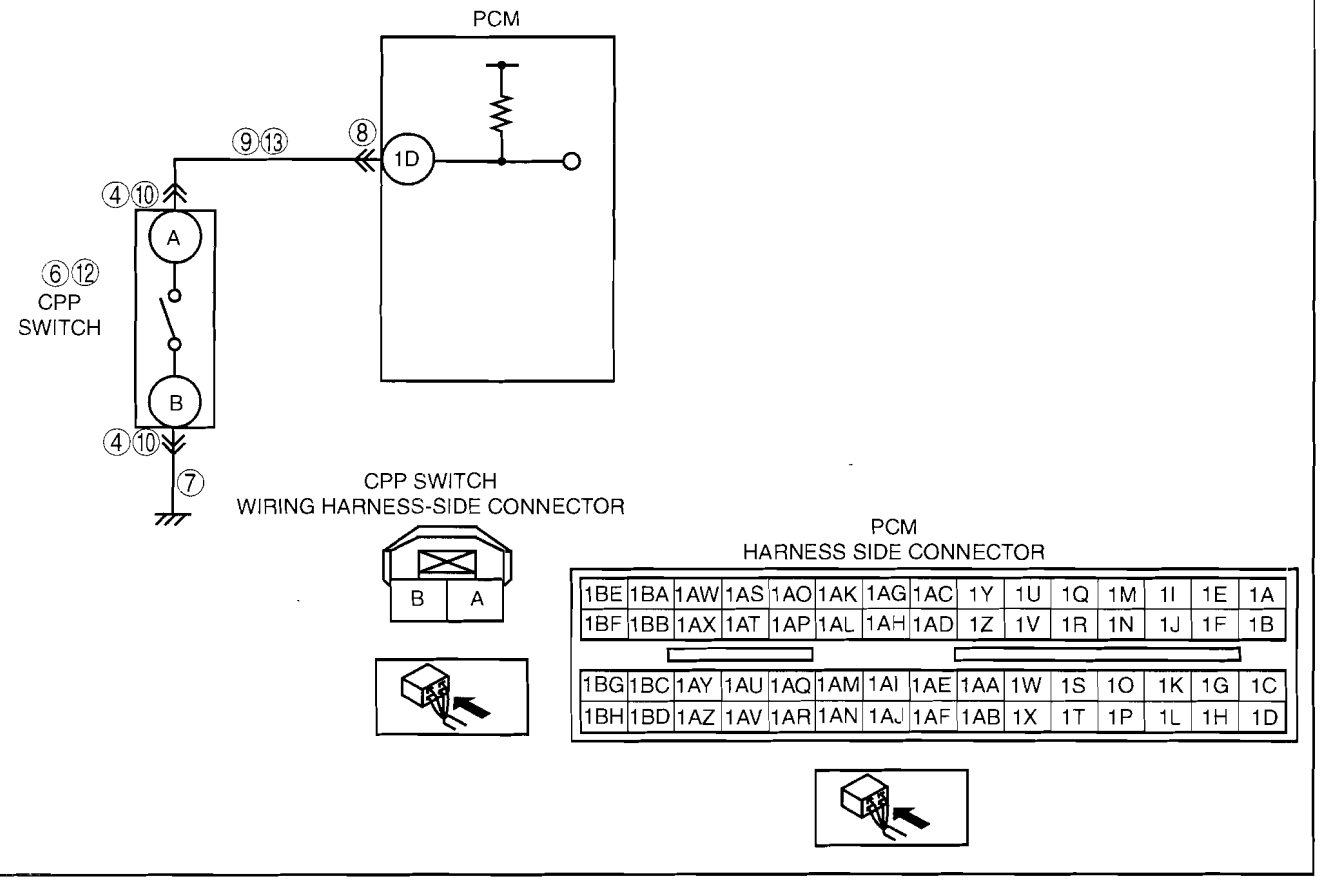
*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P0704[LF, L3]

id0102a3810000

DTC P0704	Clutch pedal position (CPP) switch input circuit problem
DETECTION CONDITION	• The PCM monitors changes in input voltage from the CPP switch. If the PCM does not detect the voltage changes while the vehicle runs with vehicle speed **above 30 km/h {19 mph}** and stops **8 times** alternately, the PCM determines that the CPP switch circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CPP switch malfunction • Poor connection of CPP switch connector or PCM connector • Short to ground in wiring harness between CPP switch terminal A and PCM terminal 1D • Open circuit in wiring harness between CPP switch terminal A and PCM terminal 1D • Open circuit in wiring harness between ground and CPP switch terminal B • PCM malfunction

DTC P0704	Clutch pedal position (CPP) switch input circuit problem



Diagnostic procedure

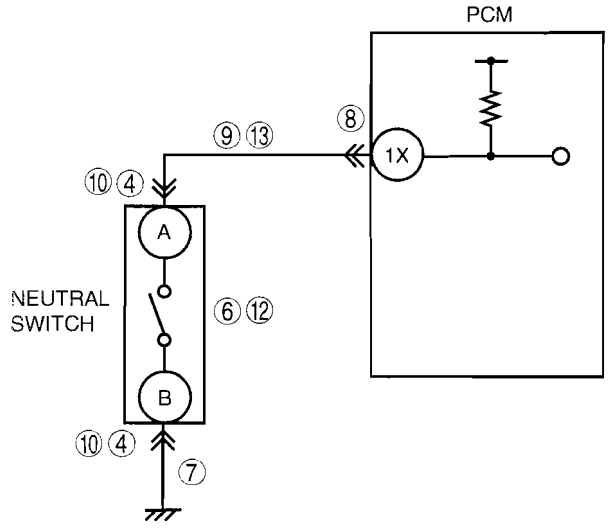
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to DLC-2. • Access CPP PID. • Verify CPP PID during clutch pedal operation. • Is CPP PID always OFF?.	Yes	Go to the next step.
		No	Go to Step 10.
4	**INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CPP switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	**CLASSIFY CPP SWITCH OR CIRCUIT** • Connect the M-MDS to DLC-2. • Access CPP PID. • Connect a jumper wire between CPP switch terminal A and B. • Is CPP PID on?	Yes	Go to the next step.
		No	Go to Step 7.

STEP	INSPECTION		ACTION
6	**INSPECT CPP SWITCH** • Inspect the CPP switch. (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].) • Is the CPP switch normal?	Yes	Go to Step 14.
		No	Replace the CPP switch, then go to Step 14.
7	**INSPECT CPP SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between CPP switch terminal B and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the CPP switch power supply for open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT CPP SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between CPP switch terminal A and PCM terminal 1D. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CPP switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
11	**CLASSIFY CPP SWITCH OR CIRCUIT** • Connect the M-MDS to DLC-2. • Access CPP PID. • Verify that CPP PID changes from ON to OFF when CPP switch connector disconnected. • Does CPP PID change from ON to OFF?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT CPP SWITCH** • Inspect the CPP switch. (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].) • Is the CPP switch normal?	Yes	Go to Step 14.
		No	Replace the CPP switch, then go to Step 14.
13	**INSPECT CPP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between CPP switch terminal A and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 14.
		No	Go to the next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Operate the clutch pedal while the vehicle runs and stops **8 times** alternately. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

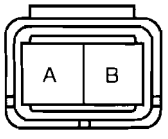
DTC P0850[LF, L3]

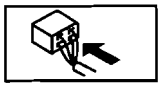
id0102a3810100

DTC P0850	Neutral switch input circuit problem
DETECTION CONDITION	• The PCM monitors changes in input voltage from the neutral switch. If the PCM does not detect the voltage changes while running vehicle with vehicle speed **above 30 km/h {19 mph}** and clutch pedal turns press and depress **10 times** repeatedly, the PCM determines that the neutral switch circuit has malfunction **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Neutral switch malfunction • Poor connection of neutral switch connector or PCM connector • Short to ground in wiring harness between neutral switch terminal A and PCM terminal 1X • Open circuit in wiring harness between neutral switch terminal A and PCM terminal 1X • Open circuit in wiring harness between ground and neutral switch terminal B • PCM malfunction



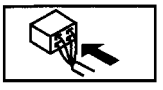
NEUTRAL SWITCH WIRING HARNESS-SIDE CONNECTOR





PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to DLC-2. • Access CPP/PNP PID. • Verify CPP/PNP PID when gear is neutral position. • Is CPP/PNP PID always off?	Yes	Go to the next step.
		No	Go to Step 10.
4	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect neutral switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access CPP/PNP PID. • Connect a jumper wire between neutral switch terminal A and B. • Is CPP/PNP PID on?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT NEUTRAL SWITCH** • Inspect the neutral switch. (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].) • Is the neutral switch normal?	Yes	Go to Step 14.
		No	Replace the neutral switch, then go to Step 14.
7	**INSPECT NEUTRAL SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between neutral switch terminal B and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the neutral switch ground circuit for open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between neutral switch terminal A and PCM terminal 1X. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the neutral switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
11	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect the M-MDS to DLC-2. • Access CPP/PNP PID. • Verify that CPP/PNP PID changes from ON to OFF when the neutral switch connector disconnected. • Does CPP/PNP PID change from ON to OFF?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT NEUTRAL SWITCH** • Inspect the neutral switch. (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].) • Is the neutral switch normal?	Yes	Go to Step 14.
		No	Replace the neutral switch, then go to Step 14.
13	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between neutral switch terminal A and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 14.
		No	Go to the next step.

STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle **above 30 km/h {19 mph}** and stop vehicle. • Depress and release the clutch pedal **more than 10 times** during drive cycle. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P1260[LF, L3]

id0102a3815600

DTC P1260	Immobilizer system problem
DETECTION CONDITION	• The instrument cluster detects an immobilizer system malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Immobilizer system malfunction • PCM malfunction

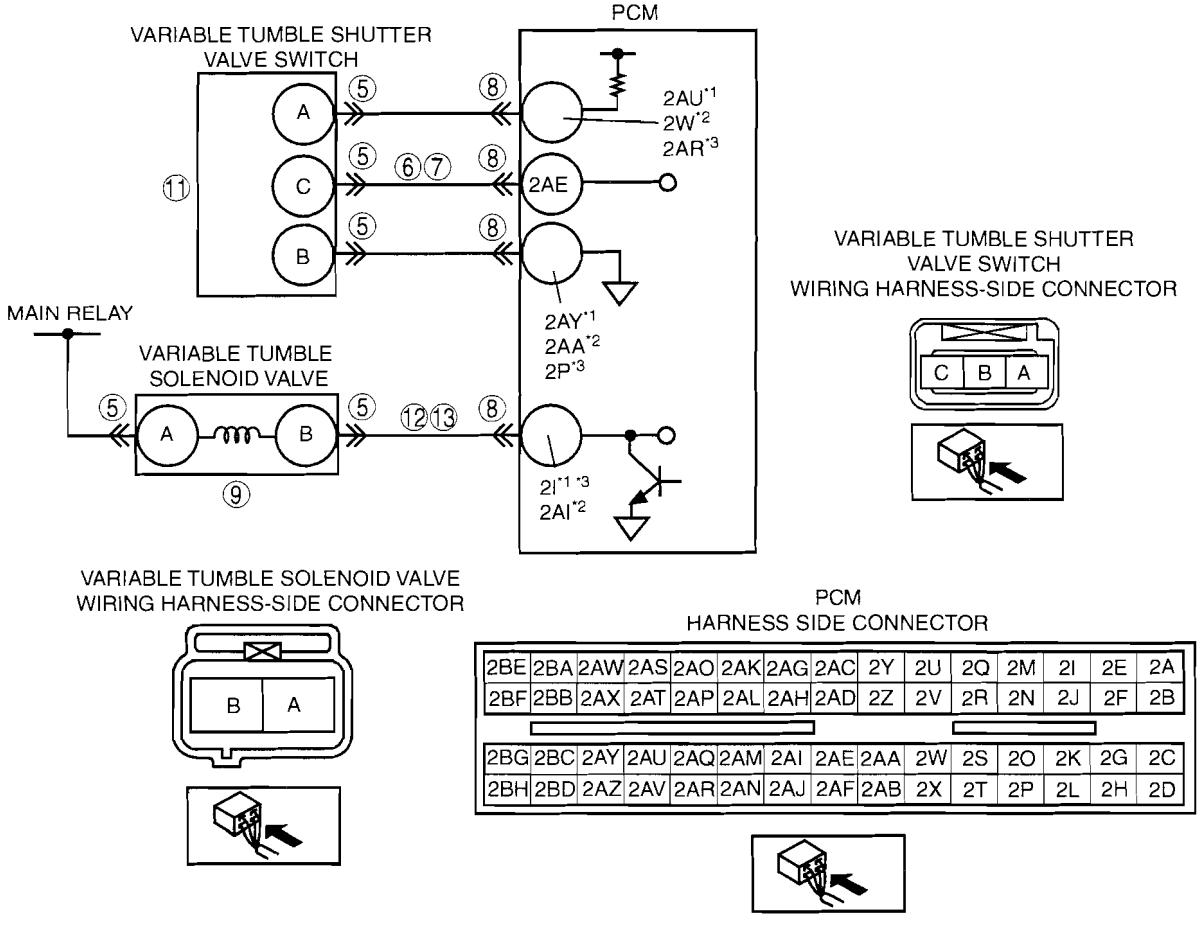
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY STORED DTC IN INSTRUMENT CLUSTER** • Turn the ignition switch to the ON position (Engine off). • Verify stored DTCs in instrument cluster. (See 09-02A-3 DTC INSPECTION[IMMOBILIZER SYSTEM].) • Are DTCs stored?	Yes	Go to the applicable DTC inspection. (See 09-02A-4 DTC TABLE[IMMOBILIZER SYSTEM].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P1260 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2004[LF, L3]

id0102a3810200

DTC P2004	Variable tumble shutter valve stuck open
DETECTION CONDITION	• The PCM monitors mass the variable tumble shutter valve position using the variable tumble position sensor. If PCM turns the variable tumble solenoid valve on but the variable tumble position still remain open (the variable tumble position sensor off), PCM determines that the variable tumble shutter valve has been stuck open. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VTC shutter valve actuator malfunction (stuck open) • Missconnecting or pull out the vacuum hose • Variable tumble solenoid valve malfunction • Variable tumble shutter valve switch malfunction • Open circuit in wiring harness between the variable tumble shutter valve switch terminal C and the PCM terminal 2AE • Short to power in wiring harness between the variable tumble shutter valve switch terminal C and the PCM terminal 2AE • Open circuit in wiring harness between the variable tumble solenoid valve terminal B and the PCM terminal 2I[*1 *3], 2AI[*2] • Short to power in wiring harness between the variable tumble solenoid valve terminal B and the PCM terminal 2I[*1 *3], 2AI[*2] • PCM malfunction



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No	Go to next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle under the following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm**: **above 35%** • Engine speed **between 1,500–2,500 rpm**: **between 25–35%** • Engine speed **above 2,500**: **below 25%** • Is the PENDING CODE for this DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
4	**VERIFY STORED OTHER DTCS** • Verify stored DTCs using M-MDS. • Is DTC P2088 or P2089 present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to next step.
5	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH CONNECTOR AND VARIABLE TUMBLE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 15.
		No	Go to the next step.
6	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the variable tumble shutter valve switch connector. • Inspect for continuity between the variable tumble shutter valve switch terminal C (wiring harness side) and the PCM terminal 2AE (wiring harness side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 15.
7	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Connect the variable tumble shutter valve switch connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2AE (wiring harness side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 15.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminals (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 15.
		No	Go to the next step.

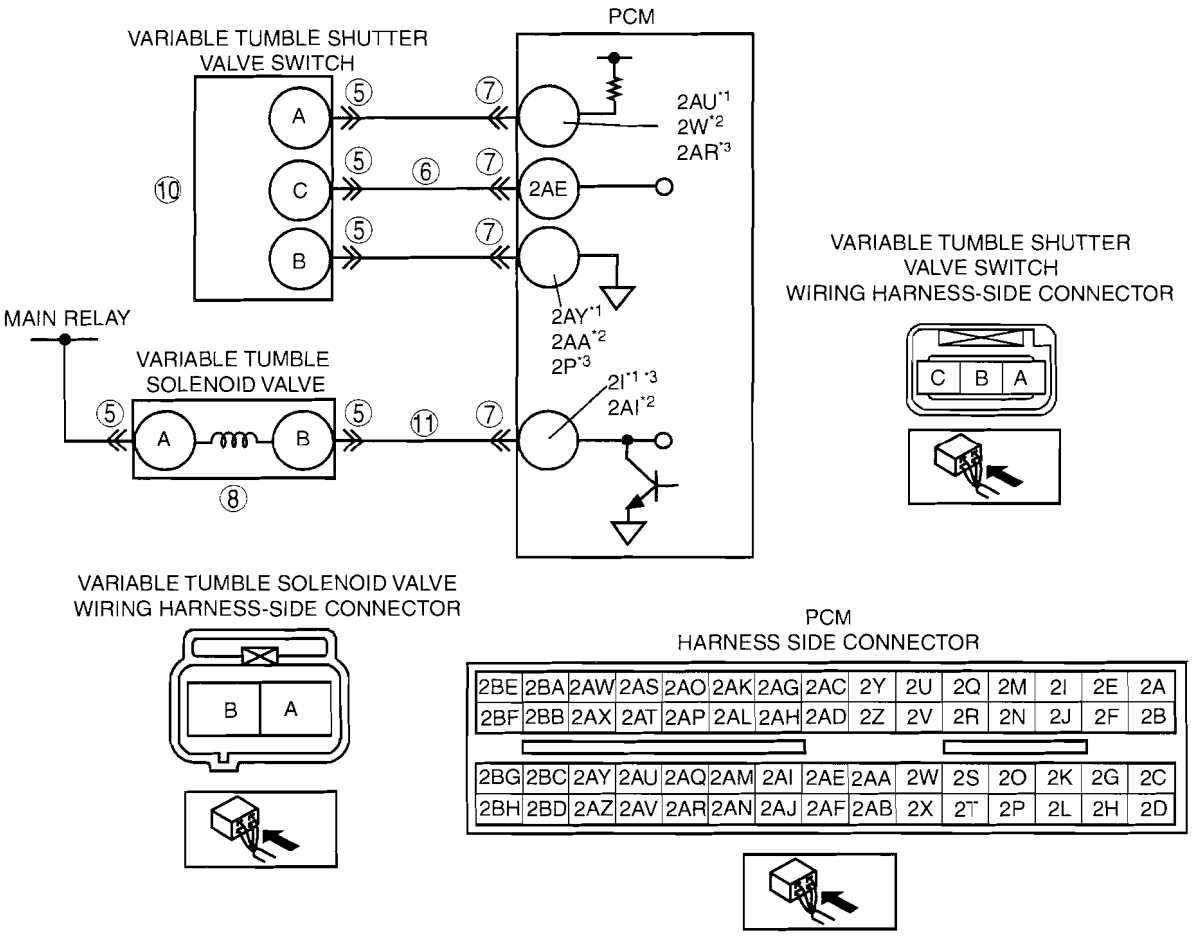
STEP	INSPECTION		ACTION
9	**INSPECT VARIABLE TUMBLE SOLENOID VALVE** • Perform "VARIABLE TUMBLE SOLENOID VALVE INSPECTION". (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].) • Is the variable tumble solenoid valve okay?	Yes	Go to next step.
		No	Replace the variable tumble solenoid valve, then go to Step 15.
10	**INSPECT VARIABLE TUMBLE SHUTTER VALVE ACTUATOR** • Perform "VTC SHUTTER VALVE ACTUATOR INSPECTION". (See 01-13A-10 VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].) • Is the variable tumble shutter valve actuator okay?	Yes	Go to next step.
		No	Replace the Intake manifold, then go to Step 15.
11	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH** • Perform "VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION". (See 01-40A-48 VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION[LF, L3].) • Is the variable tumble shutter valve switch normal?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 15.
12	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER** • Connect variable tumble solenoid valve connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2AI (wiring harness side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 15.
		No	Go to the next step.
13	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between variable tumble solenoid valve terminal B (wiring harness-side) and PCM terminal 2I[*1 *3], 2AI[*2] (wiring harness side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 15.
14	**VERIFY CONNECTION OF VACUUM HOSE ROUTING** • Verify that the vacuum hoses are connected properly. (See 01-13A-4 INTAKE AIR SYSTEM MANIFOLD VACUUM INSPECTION[LF, L3].) • Are the vacuum hoses connected properly?	Yes	Go to next step.
		No	Connect the vacuum hoses properly, then go to next step.

STEP	INSPECTION		ACTION
15	**VERIFY TROUBLESHOOTING OF DTC P2004 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Drive the vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}**. — Engine speed: **below 3,750 rpm** — Throttle opening angle is below as followings • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500–2,500 rpm: between 25–35%** • Engine speed **above 2,500: below 25%** • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2006[LF, L3]

id0102a3810300

DTC P2006	Variable tumble shutter valve stuck closed
DETECTION CONDITION	• The PCM monitors mass the variable tumble shutter valve position using the variable tumble position sensor. If PCM turns the variable tumble solenoid valve off but the variable tumble position still remain close (the variable tumble position sensor on), PCM determines that the variable tumble shutter valve has been stuck closed. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Variable tumble solenoid valve malfunction • Variable tumble shutter valve malfunction (stuck closed) • Variable tumble shutter valve switch malfunction • Variable tumble shutter valve actuator malfunction (stuck closed) • Short to ground in wiring harness between variable tumble shutter valve switch terminal C and PCM terminal 2AE • Short to ground in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I*1 *3, 2AI*2 • PCM malfunction



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle under the following conditions: — Engine coolant temperature is **above 70 °C {158 °F}**. — Engine speed: **3,500 rpm or more** — Throttle opening angle is below as following • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500–2,500 rpm: between 25–35%** • Engine speed **above 2,500: below 25%** • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
4	**VERIFY STORED OTHER DTCS** • Verify the stored DTCs using the M-MDS. • Is other DTC present except P0117, P0118, P0122, P0123 and/or P0335?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
5	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH CONNECTOR AND VARIABLE TUMBLE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 12.
		No	Go to the next step.
6	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect the variable tumble shutter valve switch connector. • Inspect for continuity between the variable tumble shutter valve switch terminal C (wiring harness side) and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 12.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminals (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 12.
		No	Go to the next step.
8	**INSPECT VARIABLE TUMBLE SOLENOID VALVE** • Perform "VARIABLE TUMBLE SOLENOID VALVE INSPECTION". (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].) • Is the variable tumble solenoid valve okay?	Yes	Go to next step.
		No	Replace the variable tumble solenoid valve, then go to Step 12.

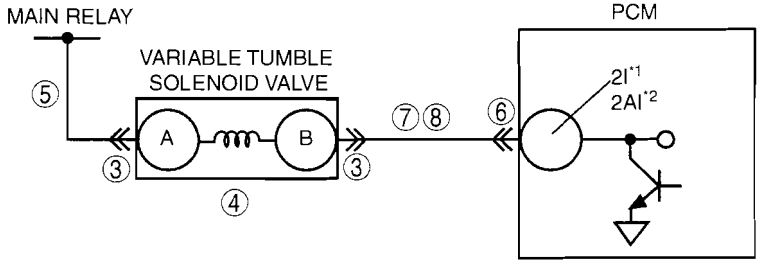
STEP	INSPECTION		ACTION
9	**INSPECT VARIABLE TUMBLE SHUTTER VALVE ACTUATOR** • Perform "VTC SHUTTER VALVE ACTUATOR INSPECTION". (See 01-13A-10 VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].) • Is the variable tumble shutter valve actuator okay?	Yes	Go to next step.
		No	Replace the Intake manifold, then go to Step 12.
10	**INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH** • Perform "VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION". (See 01-40A-48 VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION[LF, L3].) • Is the variable tumble shutter valve switch normal?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 12.
11	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Disconnect the variable tumble solenoid valve connector. • Inspect for continuity between the variable tumble solenoid valve terminal B (wiring harness side) and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF DTC P2006 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Drive the vehicle under following conditions: — Engine coolant temperature is **above 70 °C {158 °F}**. — Engine speed: **below 3,500 rpm** — Throttle opening angle is below as following • Engine speed **below 1,500 rpm**: **above 35%** • Engine speed **between 1,500–2,500 rpm**: **between 25–35%** • Engine speed **above 2,500**: **below 25%** • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

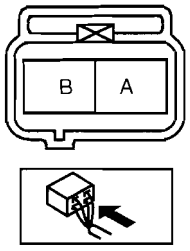
DTC P2009[LF, L3]

id0102a3810400

DTC P2009	Variable tumble solenoid valve circuit low input
DETECTION CONDITION	• The PCM monitors variable tumble solenoid valve control signal. If the PCM turns variable tumble solenoid valve off but voltage still remains low, the PCM determines that variable tumble solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or variable tumble solenoid valve • Short to ground in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I*1, 2AI*2 • Open circuit in wiring harness between main relay and variable tumble solenoid valve terminal A • Open circuit in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I*1, 2AI*2 • Variable tumble solenoid valve malfunction • PCM malfunction

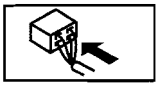


VARIABLE TUMBLE SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.

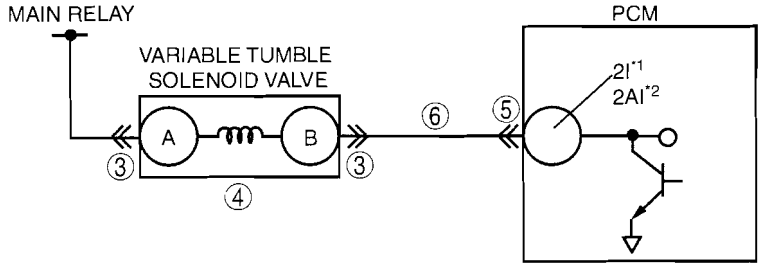
STEP	INSPECTION		ACTION
4	**INSPECT VARIABLE TUMBLE SOLENOID VALVE** • Perform the variable tumble solenoid valve inspection. (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].) • Is variable tumble solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable tumble solenoid valve, then go to Step 9.
5	**INSPECT VARIABLE TUMBLE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect the variable tumble solenoid valve connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between variable tumble solenoid valve terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2I*1, 2AI*2 (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between variable tumble solenoid valve terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
8	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect variable tumble solenoid valve connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2I*1, 2AI*2 (wiring harness side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2009 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

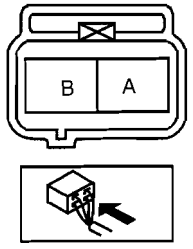
DTC P2010[LF, L3]

id0102a3810500

DTC P2010	Variable tumble solenoid valve circuit high input
DETECTION CONDITION	• The PCM monitors the variable tumble solenoid valve control signal. If the PCM turns variable tumble solenoid valve on but the voltage still remains high, the PCM determines that the variable tumble solenoid valve circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or variable tumble solenoid valve • Short to power supply in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I*1, 2AI*2 • Variable tumble solenoid valve malfunction • PCM malfunction

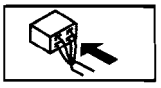


VARIABLE TUMBLE SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

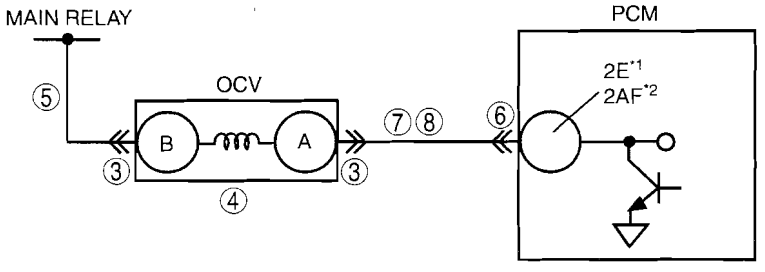
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF VARIABLE TUMBLE SOLENOID VALVE CONNECTOR** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT VARIABLE TUMBLE SOLENOID VALVE** • Inspect the variable tumble solenoid valve. (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].) • Is the variable tumble solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable tumble solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2I*1, 2AI*2. (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Remove the variable tumble solenoid valve. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2I*1, 2AI*2 and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness with short to power supply, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2010 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

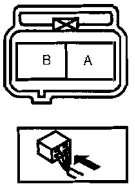
DTC P2088[LF, L3]

id0102a3810600

DTC P2088	Oil control valve (OCV) circuit low
DETECTION CONDITION	• The PCM monitors the OCV voltage. If the PCM detects the OCV control voltage (calculated from the OCV) is below the threshold voltage (calculated from the battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection at the PCM or OCV connector • Short to ground in wiring between OCV terminal A and PCM terminal 2E*1, 2AF*2 • Open circuit in wiring between the main relay and OCV terminal B • Open circuit in wiring between OCV terminal A and PCM terminal 2E*1, 2AF*2 • OCV malfunction • PCM malfunction



OCV HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.

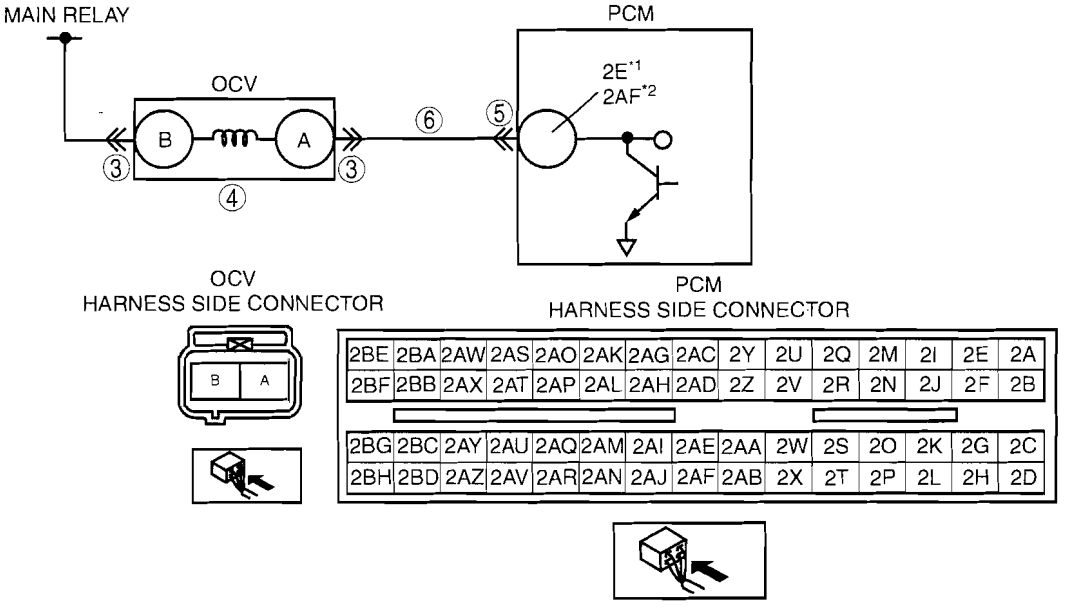
STEP	INSPECTION		ACTION
4	**INSPECT OCV** • Inspect the OCV. (See 01-10A-35 OIL CONTROL VALVE (OCV) INSPECTION[LF, L3].) • Is the OCV normal?	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 9.
5	**INSPECT OCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect the OCV connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between variable tumble control solenoid valve terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2E*1, 2AF*2 (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between OCV terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
8	**INSPECT OCV CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect the OCV connector. • Turn the ignition switch to the ON position (Engine off). • Inspect for continuity between OCV terminal A (wiring harness-side) and PCM terminal 2E*1, 2AF*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open or short circuit to ground, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2088 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P2089[LF, L3]

id0102a3810700

DTC P2089	Oil control valve (OCV) circuit high
DETECTION CONDITION	• The PCM monitors the OCV voltage. If the PCM detects the OCV control voltage (calculated from the OCV) is above the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection at the PCM or OCV connector • Short to power circuit in wiring between OCV terminal A and PCM terminal 2E*1, 2AF*2 • OCV malfunction • PCM malfunction



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT OCV** • Inspect the OCV. (See 01-10A-35 OIL CONTROL VALVE (OCV) INSPECTION[LF, L3].) • Is the OCV normal?	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2AF (such as damaged, pulled-out pins, corrosion). • Is there malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO POWER** • Remove the OCV. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2E[*1], 2AF[*2] and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power circuit, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2089 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

[*1] : LF MTX, L3 and California emission regulation applicable model with LF ATX
[*2] . Except for California emission regulation applicable model with LF ATX

DTC P2096[LF, L3]

id0102a3810800

California Emission Regulation Applicable Model

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than the specification, the PCM determines that the target A/F feedback system is too lean. **MONITORING CONDITION** — Rear HO2S voltage is **above 0.1 V** **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Middle HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Air suction in intake-air system • Front HO2S malfunction • MAF sensor malfunction • Insufficient fuel line pressure • Fuel pump unit malfunction • Leakage fuel • Improper operation ignition system • Insufficient engine compression • Fuel injector malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2096 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S12 PID. • Read O2S12 PID under the following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the TWC and middle HO2S. • If there is no leakage, replace the rear HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 17.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S11 PID. • Read O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 17.
9	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 17.
10	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect the hose in intake-air system for iooseness, cracks or damages. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Replace the fuel pump unit, then go to Step 17. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
13	**INSPECT IGNITION COIL WIRING HARNESSES** • Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. • Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses, then go to Step 17.

STEP	INSPECTION		ACTION
14	**INSPECT IGNITION SYSTEM OPERATION** • Perform spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result. Then go to Step 17.
15	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 17.
16	**INSPECT FUEL INJECTOR** • Inspect the fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See 01-14A-25 FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Air suction in intake-air system • Front HO2S malfunction • MAF sensor malfunction • Insufficient fuel line pressure • Fuel pump unit malfunction • Leakage fuel • Improper operation ignition system • Insufficient engine compression • Fuel injector malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P2096 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S12 PID. • Read O2S12 PID under the following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].) Then go to Step 17.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 17.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S11 PID. • Read O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **- 1.0 —1.0 A** when idle. — **More than 0.25 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].) Then go to Step 17.

STEP	INSPECTION		ACTION
9	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 17.
10	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect the hose in intake-air system for looseness, cracks or damages. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Replace the fuel pump unit, then go to Step 17. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
13	**INSPECT IGNITION COIL WIRING HARNESSES** • Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. • Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses, then go to Step 17.
14	**INSPECT IGNITION SYSTEM OPERATION** • Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result. Then go to Step 17.
15	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 17.
16	**INSPECT FUEL INJECTOR** • Inspect the fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2097[LF, L3]

id0102a3810900

California Emission Regulation Applicable Model

DTC P2097	Target A/F feedback system too rich
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than specification, the PCM determines that the target A/F feedback system is too rich. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Middle HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Front HO2S malfunction • Excessive fuel line pressure • Fuel pump unit malfunction • Purge valve malfunction • Insufficient engine compression • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2178 or P2188 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2097 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S12 PID. • Read O2S12 PID under following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and middle HO2S. • If there is no leakage, replace rear HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 11.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs: (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S11 PID. • Read O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 11.
9	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to Step 11. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT LONG TERM FUEL TRIM** • Connect the M-MDS to the DLC-2. • Access LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID above FREEZE FRAME DATA?	Yes	Inspect the purge valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • If there is any malfunction, replace the purge valve. (See 01-13A-3 INTAKE AIR SYSTEM HOSE ROUTING DIAGRAM[LF, L3].) Then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P2097	Target A/F feedback system too rich
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than specification, the PCM determines that the target A/F feedback system is too rich. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Front HO2S malfunction • Excessive fuel line pressure • Fuel pump unit malfunction • Purge valve malfunction • Insufficient engine compression • PCM malfunction

Diagnostic procedure

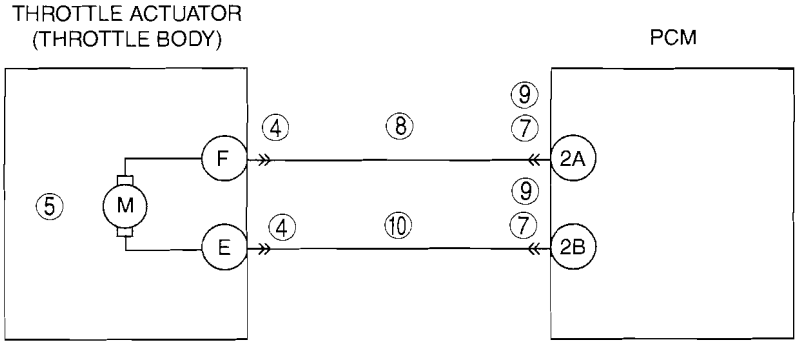
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related service repair information availability • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2178 or P2188 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P2097 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S12 PID. • Read O2S12 PID under following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].) Then go to Step 11.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs: (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S11 PID. • Read O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **–1.0 —1.0 A** when idle. — **More than 0.25 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace the front HO2S. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].) Then go to Step 11.
9	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to Step 11. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT LONG TERM FUEL TRIM** • Connect the M-MDS to the DLC-2. • Access LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID above FREEZE FRAME DATA?	Yes	Inspect the purge valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • If there is any malfunction, replace the purge valve. (See 01-13A-3 INTAKE AIR SYSTEM HOSE ROUTING DIAGRAM[LF, L3].) Then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

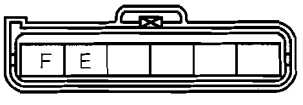
DTC P2100[LF, L3]

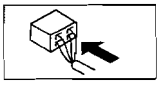
id0102a3811000

DTC P2100	Throttle actuator circuit open
DETECTION CONDITION	• The PCM monitors the electronic throttle valve motor current. If the PCM detects the electronic throttle valve motor current is below the threshold current, the PCM determines that the electronic throttle valve motor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle valve motor malfunction • Open circuit between throttle body terminal F and PCM terminal 2A • Open circuit between throttle body terminal E and PCM terminal 2B • Poor connection of the throttle body connector or the PCM connector • PCM malfunction



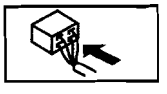
THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC using the M-MDS. • Start the engine and idle it. • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)

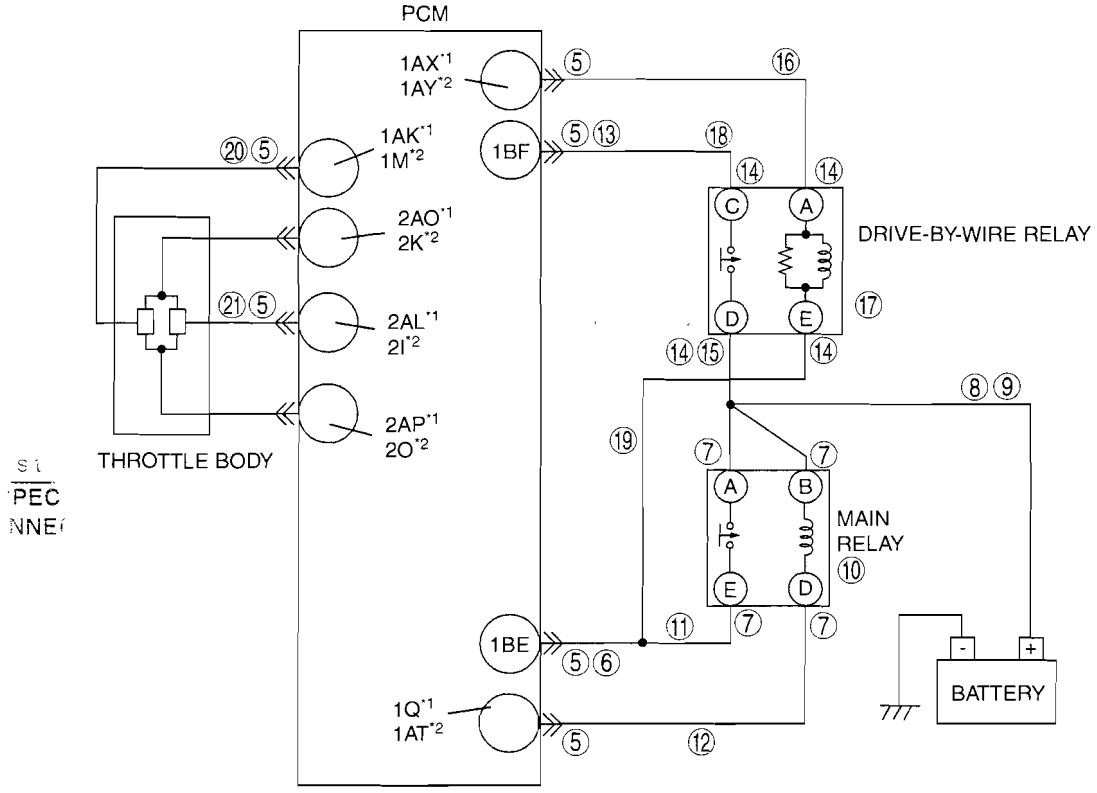
STEP	INSPECTION		ACTION
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect throttle body connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunctions?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
5	**INSPECT THROTTLE VALVE ELECTRICAL MALFUNCTION** • Measure the resistance between throttle body terminal E and F (part-side). • Is the resistance **approx. 1.3 ohms**?	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 11.
6	**CLASSIFY MALFUNCTION ET POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn the ignition switch to the ON position (Engine off). • Measure voltage between throttle body terminal F (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	There is a malfunction at the control circuit. Go to Step 9.
		No	There is a malfunction at the power supply. Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunctions?	Yes	Repair the terminal, then go to Step 11.
		No	Go to the next step.
8	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal F (wiring harness-side) and PCM terminal 2A (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 11.
9	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 11.
		No	Go to the next step.
10	**INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Inspect for continuity between throttle body terminal E (wiring harness-side) and PCM terminal 2B (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2100 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

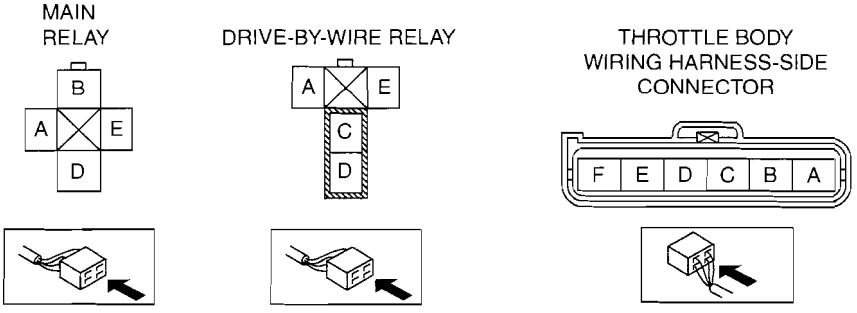
DTC P2101[LF, L3]

id0102a3811100

DTC P2101	Throttle actuator circuit range/performance
DETECTION CONDITION	**California emission regulation applicable model** • The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay on. If the input voltage is **less than 5.0 V**, the PCM determines that the drive-by-wire relay control circuit voltage is low. • The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay off. If the input voltage is **more than 5.0 V**, the PCM determines that the drive-by-wire relay control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor. (CCM) • The MIL illuminates if the PCM detects the above malfunction conditions during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • If any of the following conditions continue for a specified period of time or more the PCM detects a malfunction in the throttle actuator. — The voltage of the motor power supply is **4 V or less** while the motor relay is on — There is a system error in the electrical throttle control system of the PCM — The temperature of the electrical throttle control system in the PCM is **180 °C {356 °F}** **Diagnostic support note** • This is a continuous monitor. (CCM) • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.

DTC P2101	Throttle actuator circuit range/performance
POSSIBLE CAUSE	• Drive-by-wire relay and related circuit malfunction • Main relay and related circuit malfunction • Throttle position sensor No.1 and related circuit malfunction • Throttle position sensor No.2 and related circuit malfunction • PCM malfunction

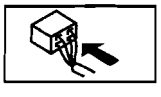




PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending and stored DTCs using the M-MDS. • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].).
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2101 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
6	**INSPECT MAIN RELAY OUTPUT VOLTAGE** • Turn the ignition switch off. • Connect the PCM connector. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 1BE and body ground. • Is the voltage **B+**?	Yes	Go to Step 13.
		No	Go to the next step.
7	**INSPECT MAIN RELAY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the main relay. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
8	**INSPECT POWER SUPPLY OF MAIN RELAY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between main relay terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 22.
9	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF MAIN RELAY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between main relay terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Go to Step 22.
10	**INSPECT MAIN RELAY** • Inspect the main relay. (See 09-21-3 RELAY INSPECTION.) • Is the main relay normal?	Yes	Go to the next step.
		No	Replace the main relay, then go to Step 22.

STEP	INSPECTION		ACTION
11	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect the main relay and the PCM connector. • Inspect for continuity between main relay terminal E (wiring harness-side) and PCM terminal 1BE (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 22.
12	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between main relay terminal D (wiring harness-side) and PCM terminal 1Q*1, 1AT*2 (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for open circuit, then go to Step 22.
		No	Go to Step 22.
13	**INSPECT DRIVE-BY-WIRE RELAY OUTPUT VOLTAGE** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 1BF (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to Step 20.
		No	Go to the next step.
14	**INSPECT POOR CONNECTION OF DRIVE-BY-WIRE RELAY CONNECTOR** • Turn the ignition switch off. • Disconnect the drive-by-wire relay. • Inspect the drive-by-wire relay connector (wiring harness-side) for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
15	**INSPECT POWER SUPPLY OF DRIVE-BY-WIRE RELAY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between drive-by-wire relay terminal D (wiring harness-side) and body ground.	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 22.
16	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF DRIVE-BY-WIRE RELAY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between drive-by-wire relay terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between drive-by-wire relay terminal A and main relay terminal C, then go to Step 22.
17	**INSPECT DRIVE-BY-WIRE RELAY** • Inspect the drive-by-wire relay. (See 09-21-3 RELAY INSPECTION.) • Is the drive-by-wire relay normal?	Yes	Go to the next step.
		No	Replace the drive-by-wire relay, then go to Step 22.
18	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between drive-by-wire relay terminal C (wiring harness-side) and PCM terminal 1BF (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 22.
19	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between drive-by-wire relay E (wiring harness-side) and PCM terminal 1BE (wiring harness-side).	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 22.

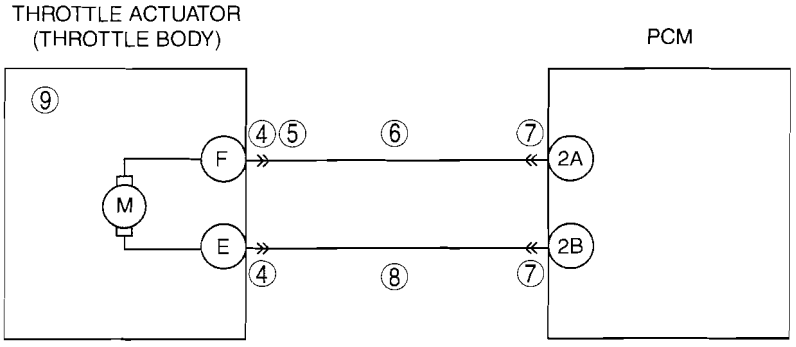
STEP	INSPECTION		ACTION
20	**INSPECT THROTTLE POSITION SENSOR NO.1 OUTPUT VOLTAGE** • Turn the ignition switch off. • Connect the PCM connector. • Turn the ignition switch to the ON position (Engine off). • Inspect the voltage between PCM terminal 2AK*1, 2M*2 and body ground. • Is the voltage **0.40—0.60 V**?	Yes	Go to the next step.
		No	Inspect throttle position sensor No.1 and the related circuits and terminals. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) Repair or replace if necessary, then go to Step 22.
21	**INSPECT THROTTLE POSITION SENSOR NO.2 OUTPUT VOLTAGE** • Turn the ignition switch to the ON position (Engine off). • Inspect the voltage between PCM terminal 2AL*1, 2I*2 and body ground. • Is the voltage **4.40—4.60 V**?	Yes	Go to the next step.
		No	Check throttle position sensor No.2 and the related circuits and terminals. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) Repair or replace if necessary, then go to the next step.
22	**VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and idle it. • Turn the ignition switch off, then to the ON position (Engine off). • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
23	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

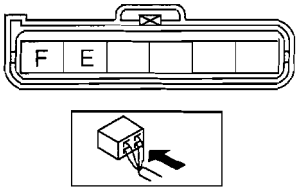
DTC P2102[LF, L3]

id0102a3811200

DTC P2102	Throttle actuator circuit low input
DETECTION CONDITION	• The PCM monitors the throttle actuator circuit current. If the PCM detects that throttle actuator circuit current is excessive low, the PCM determines that the throttle actuator circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • The PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Short to ground circuit between the throttle body terminal F and the PCM terminal 2A • Short to ground circuit between the throttle body terminal E and the PCM terminal 2B • Poor connection of the throttle body or the PCM connector • Throttle valve motor malfunction • PCM malfunction

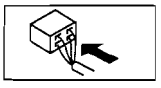


THROTTLE BODY
WIRING HARNESS-SIDE
CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



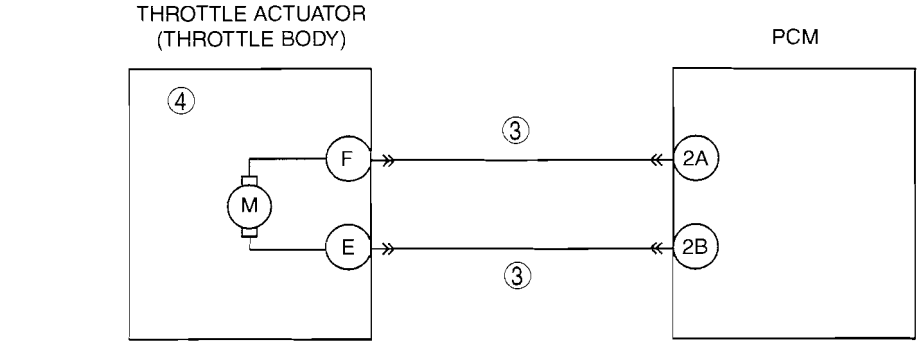
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending or stored DTCs using the M-MDS. • Is DTC P2100 also present?	Yes	Go to the appropriate DTC inspection, then go to Step 9. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged, pulled-put pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
5	**INSPECT POWER SUPPLY CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal F (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT CONTROL CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
8	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

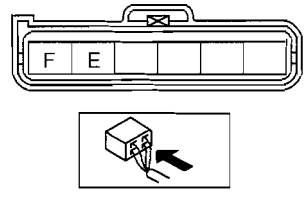
DTC P2103[LF, L3]

id0102a3811300

DTC P2103	Throttle actuator circuit high input
DETECTION CONDITION	• The PCM monitors the throttle actuator circuit current. If the PCM detects that throttle actuator circuit current is excessive high, the PCM determines that the electronic throttle actuator circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Short to power circuit between throttle body terminal E and PCM terminal 2B • Throttle valve motor malfunction • PCM malfunction



THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT CONTROL CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off. • Disconnect the throttle body and PCM connectors. • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground: — Throttle body terminal E (wiring harness-side) — Throttle body terminal F (wiring harness-side) • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short circuit to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2107[LF, L3]

id0102a3811400

DTC P2107	Throttle actuator control module processor error
DETECTION CONDITION	• Throttle actuator control module internal processor error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module internal processor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P2107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2108[LF, L3]

id0102a3811500

California Emission Regulation Applicable Model

DTC P2108	Throttle actuator control module performance error
DETECTION CONDITION	• Throttle actuator control module internal communication error • The PCM internal communication error • APP sensor internal communication error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P2108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P2108	Throttle actuator control module performance problem
DETECTION CONDITION	• PCM detects either following conditions, PCM determines that throttle actuator control system has malfunction. — TP sensor power supply voltage **below 4.4 V** — TP sensor No.1 output voltage **below 0.20 V or above 4.85 V** (DTC P0122 or P0123) — TP sensor No.2 output voltage **below 0.20 V or above 4.85 V** (DTC P0222 or P0223) — PCM internal circuit for TP sensor No.1 input circuit malfunction. **Diagnostic support note** • This is a continues monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal A and PCM terminal 2AK • Short to ground between throttle body terminal A and PCM terminal 2AK • Open circuit between throttle body terminal B and PCM terminal 2AO • Open circuit between throttle body terminal D and PCM terminal 2AP • Short to constant voltage supply between throttle body terminal A and PCM terminal 2AK • Short to constant voltage supply between throttle body terminal C and PCM terminal 2AL • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn ignition switch to OFF, then ON (Engine off). • Verify pending and/or stored DTCs using the M-MDS. • Is the DTC P0122, P0123, P0222 or P0223 also present?	Yes	Go to appropriate DTC troubleshooting procedure, then go to Step 7.
		No	Go to the next step.
4	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.1 CIRCUIT** • Perform INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.1 related harnesses and connectors. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].) • Is there any malfunction?	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to the next step.
5	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.2 CIRCUIT** • Perform INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.2 related harnesses and connectors. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].) • Is there any malfunction	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to the next step.
6	**INSPECT TP SENSOR** • Inspect TP sensor. • Is TP sensor normal?	Yes	Go to the next step.
		No	Replace throttle body, then go to nest step.
7	**VERIFY TROUBLESHOOTING OF DTC P2108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn ignition switch to ON (Engine off). • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2109[LF, L3]

id0102a3840200

DTC P2109	TP sensor minimum stop range/performance problem
DETECTION CONDITION	• The PCM monitors the minimum TP when the closed TP learning is completed. If the TP is **less than 6.03%** or **more than 18.7%**, the PCM determines that there is a TP sensor minimum stop range/ performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 5. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**INSPECT THROTTLE VALVE** • Inspect the throttle valve. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to the next step. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2109 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2112[LF, L3]

id0102a3840300

DTC P2112	Throttle actuator control system range/performance problem
DETECTION CONDITION	• The PCM monitors the throttle actuator control duty ratio when the engine is running. If the duty ratio is **more than 95%**, the PCM determines that there is a throttle actuator control system range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P2112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2119[LF, L3]

id0102a3811600

DTC P2119	Throttle actuator control throttle body range/performance problem
DETECTION CONDITION	**California emission regulation applicable model** • The PCM compares the TP with the default TP when the ignition switch is off. If the different between TP is default TP is lower than threshold, the PCM determines that there is a throttle actuator control throttle body range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
	Except for California emission regulation applicable model • The PCM compares the TP with the default TP when the ignition switch is off. If the TP is higher than the default TP, the PCM determines that there is a throttle actuator control throttle body range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

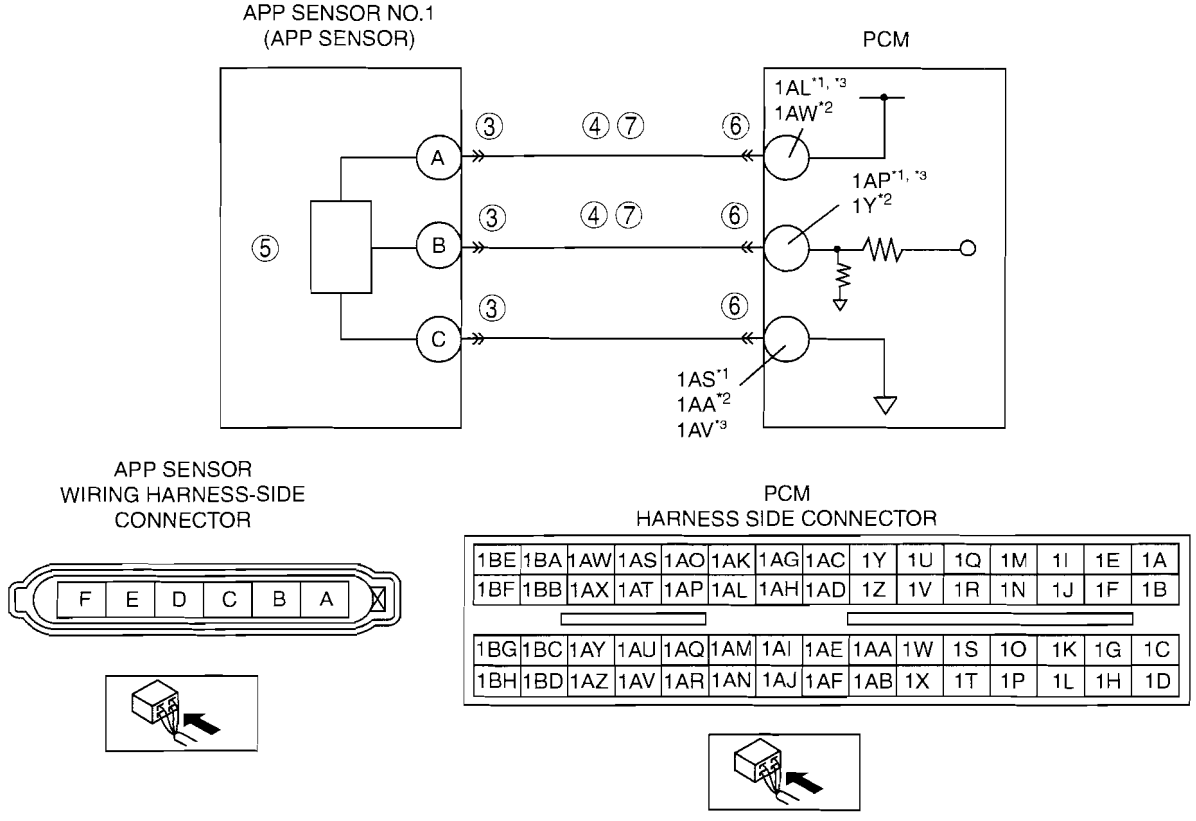
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 5. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**INSPECT THROTTLE VALVE** • Inspect the throttle valve. (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to the next step. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off), then off. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2122[LF, L3]

id0102a3811700

DTC P2122	Accelerator pedal position (APP) sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is **less than 0.12 V**, the PCM determines that the APP sensor No.1 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal A and PCM terminal 1AL*1, *3, 1AW*2 • Short to ground in wiring harness between APP sensor terminal A and PCM terminal 1AL*1, *3, 1AW*2 • Open circuit in wiring harness between APP sensor terminal B and PCM terminal 1AP*1, *3, 1Y*2 • Short to ground in wiring harness between APP sensor terminal B and PCM terminal 1AP*1, *3, 1Y*2 • PCM malfunction



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

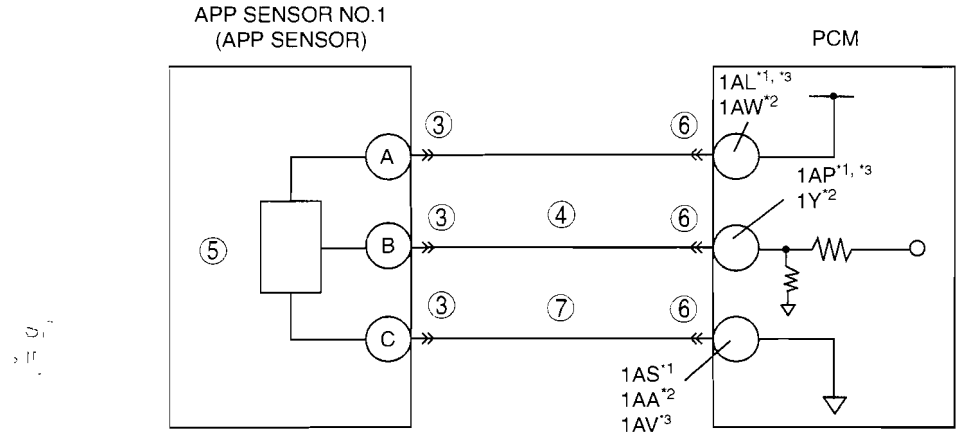
STEP	INSPECTION		ACTION
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.1 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — APP sensor terminal A (wiring harness-side) and body ground — APP sensor terminal B (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.1 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — APP sensor terminal A (wiring harness-side) and PCM terminal 1AL*1, *3, 1AW*2 (wiring harness-side) — APP sensor terminal B (wiring harness-side) and PCM terminal 1AP*1, *3, 1Y*2 (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

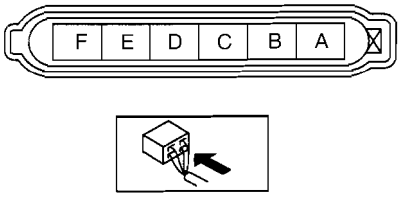
DTC P2123[LF, L3]

id0102a3811800

DTC P2123	Accelerator pedal position (APP) sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is **above 4.8 V**, the PCM determines that the APP sensor No.1 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between APP sensor terminal B and PCM terminal 1AP*1, *3, 1Y*2 • Open circuit in wiring harness between APP sensor terminal C and PCM terminal 1AS*1, 1AA*2, 1AV*3 • PCM malfunction



APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.1 GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between APP sensor terminal C (wiring harness-side) and PCM terminal 1AS*1, 1AA*2, 1AV*3 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

DTC P2126[LF, L3]

id0102a3840400

DTC P2126	Accelerator pedal position (APP) sensor No.2 range/performance problem
DETECTION CONDITION	• The PCM monitors the APP sensor duty signal. If the input signal (duty signal) is too high or too low than the set value, or the input signal intervals are too short or too long, the PCM determines that the APP sensor No.2 has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • PCM malfunction

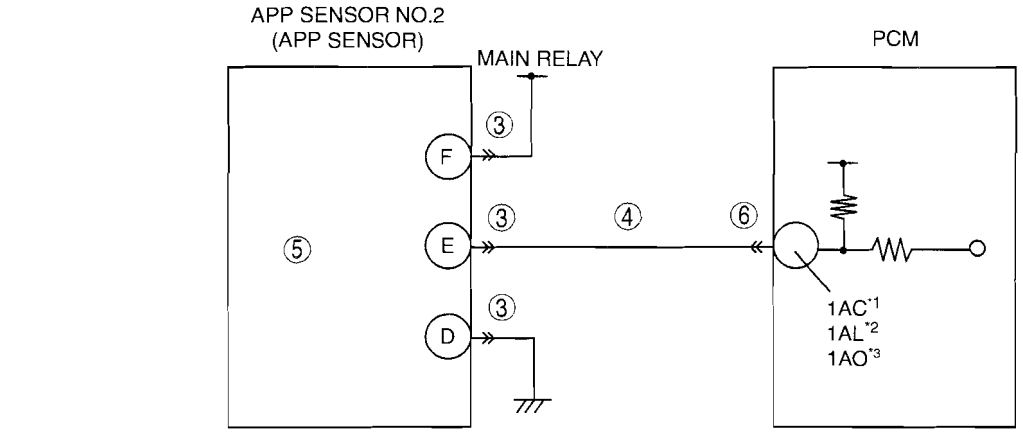
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR NO.2** • Inspect the APP sensor No.2. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 4. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2126 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

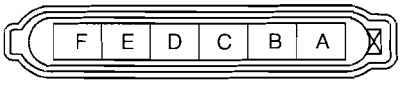
DTC P2127[LF, L3]

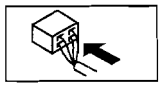
id0102a3811900

DTC P2127	Accelerator pedal position (APP) sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is **below 6 V[*1]/5.28 V[*2, *3]** for **1s**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Short to ground in wiring harness between APP sensor terminal E and PCM terminal 1AC[*1], 1AL[*2], 1AO[*3] • PCM malfunction



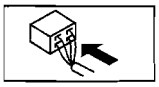
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

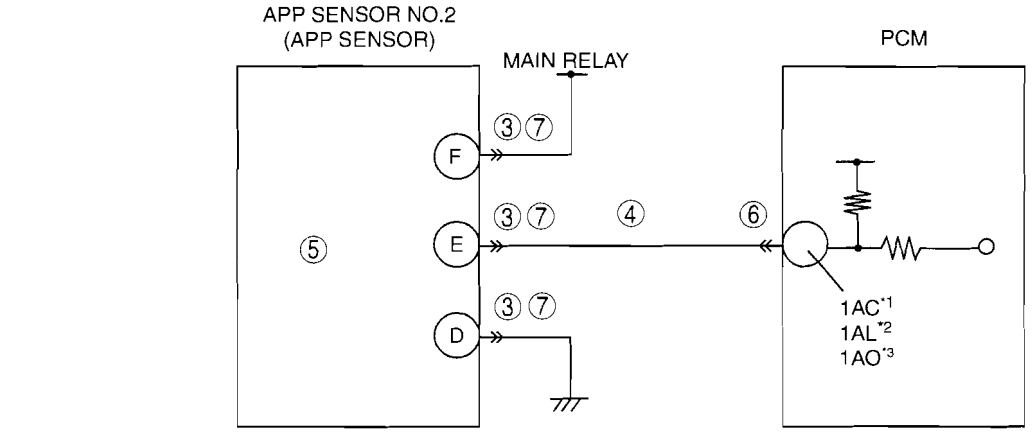
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.2 CIRCUIT FOR SHORT TO ground** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — APP sensor terminal E (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 7.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.2** • Inspect the APP sensor No.2. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 7. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

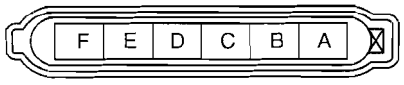
DTC P2128[LF, L3]

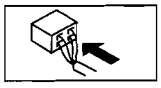
id0102a3812000

DTC P2128	Accelerator pedal position (APP) sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is **more than 6 V*1/7.2 V*2, *3for 1 s**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal F and main relay • Open circuit in wiring harness between APP sensor terminal D and body ground • Open circuit in wiring harness between APP sensor terminal E and PCM terminal 1AC*1, 1AL*2, 1AO*3 • Short to power supply in wiring harness between APP sensor terminal E and PCM 1AC*1, 1AL*2, 1AO*3 • PCM malfunction



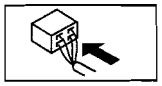
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is a[illegible]ated repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal E (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.2** • Inspect APP sensor No.2. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — APP sensor terminal D (wiring harness-side) and body ground — APP sensor terminal E (wiring harness-side) and PCM 1AC*1, 1AL*2, 1AO*3 (wiring harness-side) — APP sensor terminal F (wiring harness-side) and main relay • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

DTC P2135[LF, L3]

id0102a3812100

DTC P2135	TP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from TP sensor No.1 with the input voltage from TP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is a TP sensor No.1/No.2 voltage correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT TP SENSOR** • Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 6. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2138[LF, L3]

id0102a3812200

DTC P2138	APP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from APP sensor No.1 with the input voltage from APP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is an APP sensor No.1/No.2 angle correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • APP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT APP SENSOR** • Inspect the APP sensor. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 6. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2177[LF, L3]

id0102a3812300

DTC P2177	Fuel system too lean at off idle
DETECTION CONDITION	• The PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too lean at off-idle. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel injection pump) malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Leakage exhaust system • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2177 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access APP1, APP2, ECT, MAF, TP and VSS PIDs using M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 17.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses repair or replace it. Then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2177 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 17.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 17.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 17.
		No	Go to the next step.
10	**INSPECT PURGE SOLENOID OPERATION** • Perform Purge Control System Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does the purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 17.
11	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. • Inspect the fuel line pressure. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 17. If the fuel line pressure is low, go to the next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 17.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter. Then go to Step 17.
13	**INSPECT IGNITION SYSTEM** • Perform spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result, then go to Step 17.
14	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 17.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 17.
16	**INSPECT FUEL INJECTOR OPERATION** • Remove the fuel injector. • Inspect the fuel injector (resistance, injection amount). (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is the fuel injector normal?	Yes	Go to the next step.
		No	Replace the fuel injector, then go to the next step.

STEP	INSPECTION		ACTION
17	**VERIFY TROUBLESHOOTING OF DTC P2177 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test or the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2178[LF, L3]

id0102a3812400

DTC P2178	Fuel system too rich at off idle
DETECTION CONDITION	• The PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too rich at off-idle. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel injection pump) malfunction • Fuel pump malfunction • EGR valve improper operation • Variable tumble solenoid valve improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • PCV valve malfunction • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.

STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2178 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access APP1, APP2, ECT, MAF, TP1 and VSS PIDs using M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 16.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 16.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2177 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 16.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2 • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 16.
9	**INSPECT PURGE SOLENOID OPERATION** • Perform Purge Control System Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 16.
10	**INSPECT PCV VALVE OPERATION** • Inspect the PCV valve operation. (See 01-16A-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3].) • Is the PCV valve normal?	Yes	Go to the next step.
		No	Replace the PCV valve, then go to Step 16.
11	**INSPECT EGR VALVE OPERATION** • Perform EGR Control System Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does the EGR control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 16.
12	**INSPECT VTCS OPERATION** • Perform Variable Tumble Control Operation Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does the VTCS work properly?	Yes	Go to Step 15.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 16.
13	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. • Inspect the fuel line pressure. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to the next step.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 16. If the fuel line pressure is low, go to the next step.

STEP	INSPECTION		ACTION
14	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect the fuel line for any leakage. • Is fuel leakage found?	Yes	Replace suspected fuel line, then go to the next step.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean off the fuel tank and filter. Then go to the next step.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to the next step.
16	**VERIFY TROUBLESHOOTING OF DTC P2178 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test or the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2187[LF, L3]

id0102a3812500

DTC P2187	Fuel system too lean at idle
DETECTION CONDITION	• The PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too lean at idle. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel injection pump) malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2177 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access APP1, APP2, ECT, MAF and TP1 PIDs using M-MDS.) • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 17.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 17.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2177 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 17.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 17.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT PURGE SOLENOID VALVE STUCK OPEN** • Turn the ignition switch off. • Disconnect both hoses from purge solenoid valve. • Blow air through purge solenoid valve. • Does air blow through?	Yes	Replace the purge solenoid valve. Then go to Step 17.
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. • Inspect the fuel line pressure. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 13.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 17. If the fuel line pressure is low, go to the next step.
12	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 17.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean off the fuel tank and filter. Then go to Step 17.
13	**INSPECT IGNITION SYSTEM** • Perform spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test results, then go to Step 17.
14	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 17.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 17.
16	**INSPECT FUEL INJECTOR OPERATION** • Remove the fuel injector. • Inspect the fuel injector (resistance, injection amount). (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is the fuel injector normal?	Yes	Go to the next step.
		No	Replace the fuel injector, then go to the next step.
17	**VERIFY TROUBLESHOOTING OF DTC P2187 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test or the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2188[LF, L3]

id0102a3812600

DTC P2188	Fuel system too rich at idle
DETECTION CONDITION	• The PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too rich at idle. **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator (built-in fuel injection pump) malfunction • Fuel pump malfunction • EGR valve stuck open • VTCS improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • PCV valve malfunction • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is other DTC present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2178 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access APP1, APP2, ECT, MAF, TP1 and VSS PIDs using M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair or if necessary. Then go to Step 16.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 16.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access O2S11 for P2177 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **Less than 1 mA** when accelerator pedal is suddenly depressed (rich condition). — **More than 1 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 16.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 16.
9	**INSPECT PURGE SOLENOID OPERATION** • Perform Purge Control System Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 16.
10	**INSPECT PCV VALVE OPERATION** • Inspect the PCV valve operation. (See 01-16A-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3].) • Is the PCV valve normal?	Yes	Go to the next step.
		No	Replace the PCV valve, then go to Step 16.
11	**INSPECT VTCS OPERATION** • Perform Variable Tumble Control Operation Inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does the VTCS work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 16.
12	**INSPECT FUEL LINE PRESSURE** • Turn the ignition switch off. • Inspect the fuel line pressure. (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is the fuel line pressure normal?	Yes	Go to Step 14.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 16. If the fuel line pressure is low, go to the next step.
13	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for any leakage. • Is fuel leakage found?	Yes	Replace the fuel line, then go to Step 16.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure). If for foreign materials or stain inside fuel filter (low-pressure), clean off fuel tank and filter. Then go to Step 16.
14	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Does variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 16.
15	**INSPECT IF EGR VALVE IS STUCK OPEN** • Remove the EGR valve. • Does the EGR valve stuck open?	Yes	Clean or replace the EGR valve, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
16	**VERIFY TROUBLESHOOTING OF DTC P2188 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test or the PCM Adaptive Memory Produce Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2195[LF, L3]

id0102a3812700

California Emission Regulation Applicable Model

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **more than 1.2 A** for **25 s**, the PCM determines that the front HO2S signal remains lean. **MONITORING CONDITION** — ECT: more than **70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — MAF amount: **6—80 g/s {0.80—10.58 lb/min}** — Target A/F feedback system status: feedback control — Output voltage from the middle HO2S: **more than 0.2 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Insufficient fuel line pressure • Leakage exhaust gas • Air suction at intake-air system malfunction • Leakage fuel • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2195 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 14.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 14.
7	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for loosen, cracks or damages hose in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 14.
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 14.
9	**INSPECT FRONT HO2S** • Inspect front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace front HO2S, then go to Step 14. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 14. (See 01-14A-25 FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.

STEP	INSPECTION		ACTION
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to the next step.
		No	Replace the fuel pump unit, then go to the next step. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
13	**VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO self-test with M-MDS, or PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **more than 1.2 A** for **25 s**, the PCM determines that the front HO2S signal remains lean. **MONITORING CONDITION** — ECT: more than **70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — Target A/F feedback system status: feedback control — Charging efficiency: **20—62.5 %** — Output voltage from the front HO2S: **more than 0.2 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Insufficient fuel line pressure • Leakage exhaust gas • Air suction at intake-air system malfunction • Leakage fuel • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2195 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 13.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 13.
7	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for looseness, cracks or damage hose in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 13.
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 13.
9	**INSPECT FRONT HO2S** • Inspect front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 13. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 13. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace the malfunctioning part, then go to the next step.
		No	Replace the fuel pump unit, then go to the next step. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
13	**VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2196[LF, L3]

id0102a3812800

California Emission Regulation Applicable Model

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **less than 0.85 A** for **25 s**, the PCM determines that the front HO2S signal remains rich. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — MAF amount: **6—80 g/s {0.80—10.58 lb/min}** — Target A/F feedback system status: feedback control — Output voltage from the middle HO2S: **less than 0.8 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Excessive fuel pressure • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2196 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 11.
8	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace front HO2S, then go to Step 11. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 11. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to the next step. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO self-test with M-MDS, or PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

Except for California Emission Regulation Applicable Model

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the front HO2S output current when the following conditions are met. If the average output current is **less than 0.85 A** for **25 s**, the PCM determines that the front HO2S signal remains rich. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — Charging efficiency: **20—62.5 %** — Output voltage from the front HO2S: **less than 0.7 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • Are any DTCs is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Excessive fuel pressure • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2196 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].) — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. — APP1 — APP2 — ECT — MAF — TP1 — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 11.
8	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 11. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR** • Inspect fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace suspected fuel injector, then go to Step 11. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel pump unit, then go to the next step. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2228[LF, L3]

id0102a3812900

DTC P2228	BARO sensor circuit low input
DETECTION CONDITION	• The PCM monitors input voltage from BARO sensor into the PCM. If input voltage is **below 2.1 V*1, 1.95 V*2**, PCM determines that BARO sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • PCM malfunction

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BARO SENSOR MALFUNCTION** • Inspect the BARO sensor. (See 01-40A-72 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[LF, L3].) • Is the BARO sensor okay?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	No concern is detected. Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2229[LF, L3]

id0102a3813000

DTC P2229	BARO sensor circuit high input
DETECTION CONDITION	• The PCM monitors input voltage from BARO sensor into the PCM. If input voltage is **above 4.0 V*1, 4.45 V*2**, PCM determines that BARO sensor circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • PCM malfunction

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

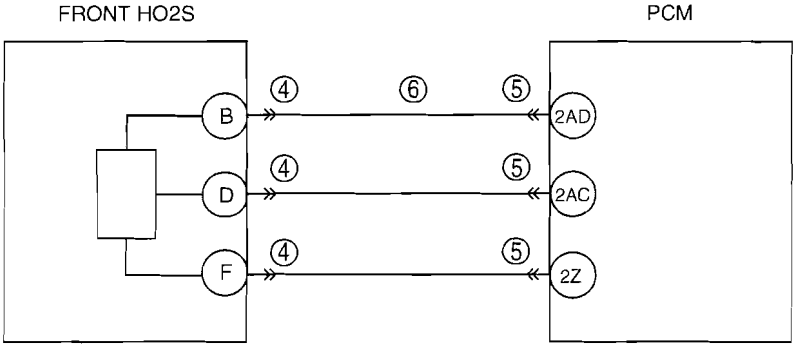
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BARO SENSOR MALFUNCTION** • Inspect the BARO sensor. (See 01-40A-72 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[LF, L3].) • Is the BARO sensor okay?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

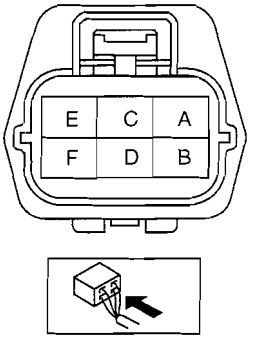
DTC P2237[LF, L3]

id0102a3813100

DTC P2237	Front HO2S positive current control circuit open
DETECTION CONDITION	• The PCM monitors front HO2S positive current control circuit voltage. If the voltage is not changed against the PCM control value while the engine running, the PCM determines that the front HO2S positive current control circuit is open. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2AD and front HO2S terminal B • PCM malfunction



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

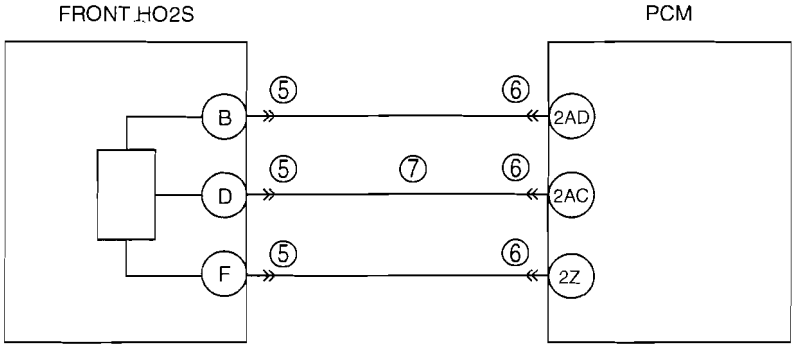
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2237 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See01-02A-22 DTC TABLE[LF, L3].)
4	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT FRONT HO2S POSITIVE CURRENT CIRCUIT FOR OPEN CIRCUIT** • Front HO2S and PCM connectors disconnected. • Verify the continuity between PCM terminal 2AD (wiring harness-side) and front HO2S terminal B (wiring harness-side). • Is there continuity?	Yes	Replace the front HO2S, then go to the next step.
		No	Repair or replace wiring harness for open, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2237 COMPLETED** • Make sure to reconnect all disconnected • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P2237 present?	Yes	Replace PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

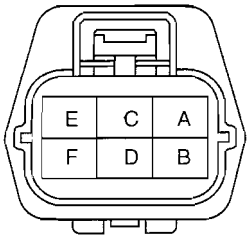
DTC P2251[LF, L3]

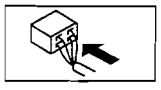
id0102a3813400

DTC P2251	Front HO2S negative current control circuit open
DETECTION CONDITION	• The PCM monitors front HO2S negative current control circuit voltage. If the voltage is not changed against the PCM control value while the engine running, the PCM determines that the front HO2S negative current control circuit is open. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2AC and front HO2S terminal D • Front HO2S heater can not be controlled • PCM malfunction



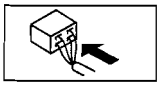
FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using the M-MDS. • Is the DTC P0030, P0031 or P0032 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P2251 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT FRONT HO2S NEGATIVE CURRENT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Front HO2S and PCM connectors disconnected. • Verify the continuity between PCM terminal 2AC and D at wiring harness-side connectors. • Is there continuity?	Yes	Replace the front HO2S, then go to the next step.
		No	Repair or replace for an open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2251 COMPLETED** • Make sure to reconnect all disconnected connectors • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOEO or KOER self-test. (See 01-02A-16 KOEO/KOER SELF TEST[LF, L3].) • Is the DTC P2251 present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2270[LF, L3]

id0102a3827200

DTC P2270	Middle HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the middle HO2S input voltage when the following conditions are met. If the subtracted input voltage from the target voltage (calculated by PCM) is **0.4 V or less** for **30 s**, the PCM determines that the front HO2S signal remains lean. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Engine speed: **more than 1,500 rpm** — MAF amount: **more than 10 g/s {1.32 lb/min}** — Short term fuel trim: **–20—20%** — Long term fuel trim: **–15—15%** — Fuel injection system status: feedback control **Diagnostic support note** • This is a intermittent monitor (HO2S). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Middle HO2S malfunction • Leakage fuel • Fuel injector malfunction • Air suction at intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2195 present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2270 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF THE MIDDLE HO2S** • Start the engine and warm it up completely. • Access O2S12 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — **More than 0.45V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the middle HO2S. • If there is no leakage, replace the middle HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY TROUBLESHOOTING OF DTC P2270 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Stop the vehicle and access ON BOARD READINESS TEST to inspect drive mode completion status. • Verify O2S_EVAL PID changes to yes. — If not, perform the DRIVE MODE again. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2271[LF, L3]

id0102a3827300

DTC P2271	Middle HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the middle HO2S input voltage when the following conditions are met. If the subtracted input voltage from the target voltage (calculated by PCM) is **0.85 V or more** for **25 s**, or is **above 0.3 V** when the fuel cut, the PCM determines that the front HO2S signal remains rich. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Engine speed: **more than 1,500 rpm** — MAF amount: **more than 10 g/s {1.32 lb/min}** — Short term fuel trim: **-20 — 20%** — Long term fuel trim: **-15 — 15%** — Fuel injection system status: feedback control **Diagnostic support note** • This is a intermittent monitor (HO2S). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Middle HO2S malfunction • Front HO2S malfunction • Rear HO2S malfunction • Front HO2S heater malfunction • Middle HO2S heater malfunction • Rear HO2S heater malfunction • Fuel pump control malfunction • Fuel pressure malfunction • Fuel injector malfunction • Leakage exhaust gas • Leakage engine coolant • Purge solenoid valve malfunction • Purge solenoid valve hoses improper connection • Restriction in intake-air system • Insufficient compression — Engine oil malfunction — Increase oil pressure — Metering oil pump malfunction — Metering oil pump control malfunction — Engine malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is DTC P2196 present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2270 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF MIDDLE HO2S** • Start the engine and warm it up completely. • Access O2S12 PID using M-MDS. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the middle HO2S. • If there is no leakage, replace the middle HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2271 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Stop the vehicle and access ON BOARD READINESS TEST to inspect drive mode completion status. • Verify O2S_EVAL PID changes to yes. — If not, perform the DRIVE MODE again. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2274[LF, L3]

id0102a3840800

DTC P2274	Rear HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the rear HO2S input voltage when the following conditions are met. If the subtracted input voltage from the target voltage (calculated by PCM) is **below 0.17 V** even after recovery from fuel cut, the PCM determines that the front HO2S signal remains lean. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Leakage exhaust gas • Rear HO2S malfunction • Fuel injector malfunction • Leakage fuel • MAF sensor malfunction • ECT sensor malfunction • Air suction at intake-air system • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2274 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Start the engine and warm it up completely. • Access O2S13 PID using M-MDS. • Check PID under following the accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of the accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the TWC and the rear HO2S. • If there is no leakage, replace the rear HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 10.
6	**INSPECT THE FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Inspect the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**INSPECT THE PURGE SOLENOID VALVE** • Inspect the purge solenoid valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 10. (See 01-13A-3 INTAKE AIR SYSTEM HOSE ROUTING DIAGRAM[LF, L3].)
		No	Go to the next step.
8	**INSPECT THE FUEL INJECTOR** • Inspect the fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step 10. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**INSPECT THE ENGINE COOLANT PASSAGE FOR THE ENGINE COOLANT LEAKAGE** • Perform the engine coolant leakage inspection. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
10	**VERIFY TROUBLESHOOTING OF THE DTC P2274 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Stop the vehicle and access ON BOARD READINESS TEST to inspect drive mode completion status. • Verify O2S_EVAL PID changes to yes. — If not, perform the DRIVE MODE again. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2275[LF, L3]

id0102a3840900

DTC P2275	Rear HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the rear HO2S input voltage when the following conditions are met. If the subtracted input voltage from the target voltage (calculated by PCM) is **above 0.17 V** when the fuel cut, the PCM determines that the front HO2S signal remains rich. **Diagnostic support note** • This is a intermittent monitor (HO2S). • The MIL illuminates if PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Rear HO2S heater malfunction • Pressure regulator malfunction (built-in fuel pump unit) • Fuel injector malfunction • Leakage exhaust gas • Purge solenoid valve malfunction • Purge solenoid valve hoses improper connection • Insufficient engine compression • Engine malfunction (leakage engine coolant) • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

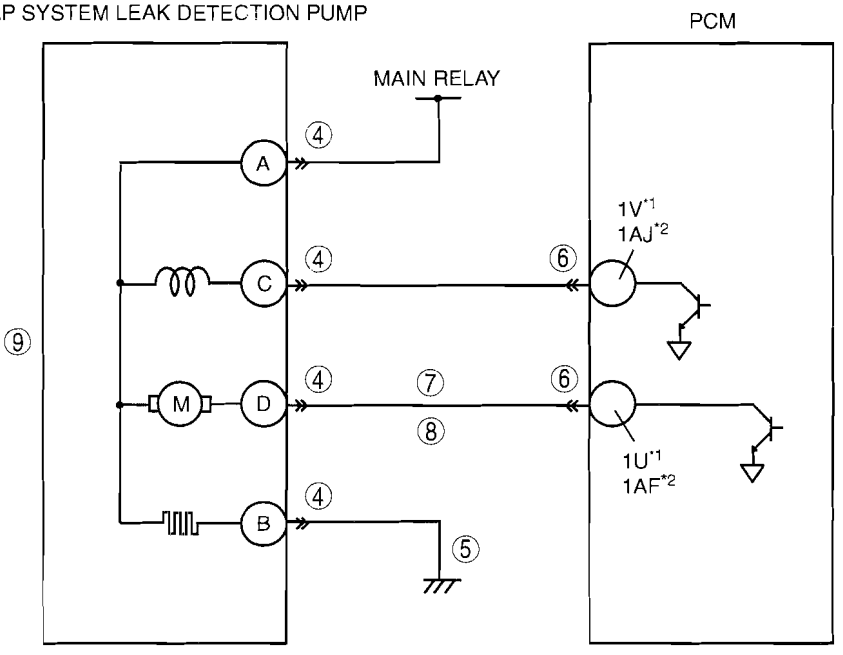
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are there any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2275 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF THE REAR HO2S** • Start engine and warm it up completely. • Access O2S13 PID using the M-MDS. • Check PID under following the accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading normal? — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition)	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the TWC and the rear HO2S. • If there is no leakage, replace rear HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) Then go to Step 11.

STEP	INSPECTION		ACTION
6	**INSPECT THE PURGE SOLENOID VALVE** • Inspect the purge solenoid valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to Step 11. (See 01-13A-3 INTAKE AIR SYSTEM HOSE ROUTING DIAGRAM[LF, L3].)
		No	Go to the next step.
7	**INSPECT THE FUEL LINE PRESSURE** • Perform the "FUEL LINE PRESSURE INSPECTION". (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 9.
8	**INSPECT THE FUEL SYSTEM FOR FUEL LEAKAGE** • Visually inspect fuel leakage in the fuel system. • Is there fuel leakage?	Yes	Repair or replace malfunctioning part, then go to Step 11.
		No	Replace fuel pump, then go to Step 11.
9	**INSPECT THE FUEL INJECTOR** • Inspect fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the fuel injector, then go to Step11. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**INSPECT THE ENGINE COOLANT PASSAGE FOR ENGINE COOLANT LEAKAGE** • Perform the engine coolant leakage inspection. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P2275 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Stop vehicle and access ON BOARD READINESS TEST to inspect drive mode completion status. • Verify O2S_EVAL PID changes to yes. — If not, perform the DRIVE MODE again. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

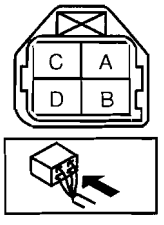
DTC P2401[LF, L3]

id0102a3813500

DTC P2401	EVAP system leak detection pump motor circuit low
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is lower than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Open circuit between the main relay and EVAP system leak detection pump terminal A • Open circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U*1, 1AF*2 • Short to ground circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U*1, 1AF*2 • Poor connection at EVAP system leak detection pump or PCM connector • PCM malfunction

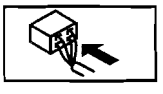


EVAP SYSTEM DETECTION PUMP HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify related PENDING CODE or stored DTC. • Is DTC P2405 present?	Yes	Go to the applicable DTC inspection. (See 01-02A-288 DTC P2405[LF, L3].)
		No	Go to the next step.
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
5	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between EVAP system leak detection pimp terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 10.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 10.
		No	Go to the next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
8	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and PCM terminal 1U[*1], 1AF[*2] (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 10.
9	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Perform EVAP system leak detection pump inspection. (See 01-16A-10 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3].) • Is the EVAP system leak detection pump normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.

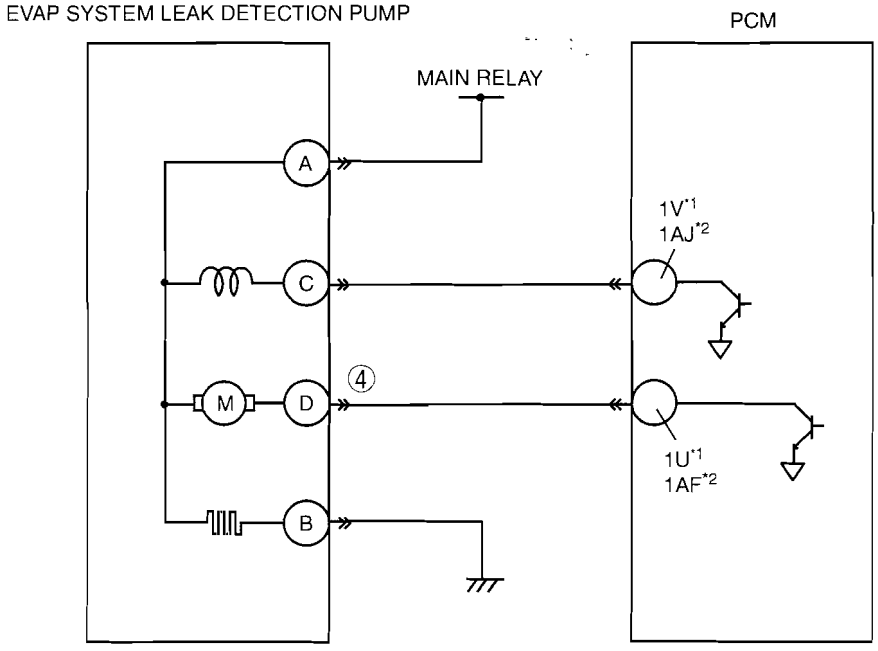
STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative emission test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

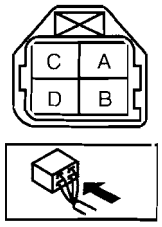
DTC P2402[LF, L3]

id0102a3813600

DTC P2402	EVAP system leak detection pump motor circuit high
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is higher than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Short to power circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U*1, 1AF*2 • PCM malfunction

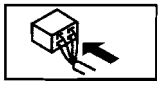


EVAP SYSTEM DETECTION PUMP HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to the next step.
		No	Go to the next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position. • Disconnect the EVAP system leak detection pump connector. • Measure the voltage between EVAP system leak detection pump terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative system test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

DTC P2404[LF, L3]

id0102a3813700

DTC P2404	EVAP system leak detection pump sense circuit problem
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. After obtaining the reference current value, if the time in which the pump load current reaches the reference current value is less than the specification, the PCM determines air filter has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Air filter clogging • EVAP hose bending • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnostic according to available repair information. • If vehicle is not repaired, then go to the next step.
		No	Go to the next step.
3	**INSPECT EVAP HOSE BENDING** • Inspect the EVAP hose for bending. • Is the EVAP hose normal?	Yes	Go to the next step.
		No	Repair or replace the hose, then go to Step 5.
4	**INSPECT AIR FILTER FOR CLOGGING** • Inspect the air filter for clogging. • Is the air filter normal?	Yes	Go to the next step.
		No	Replace the air filter, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative system test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2405[LF, L3]

id0102a3813800

DTC P2405	EVAP system leak detection pump sense circuit low input
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the current is lower than the specification while the PCM obtains the reference current value, the PCM determines EVAP system leak detection pump orifice has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump orifice fallen off • EVAP system leak detection pump motor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative emission test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3].) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2407[LF, L3]

id0102a3813900

DTC P2407	EVAP system leak detection pump sense circuit intermittent
DETECTION CONDITION	• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When either of the following is detected 6 times or more successively, the PCM determines EVAP system leak detection pump heater has a malfunction: — While obtaining the reference current value, the change in pump load current exceeds the specification. — After obtaining the reference current value, the pump load current is kept lower than the maximum pump load current for more than the specified time. **Diagnostic support note** • This is a intermittent monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the malfunction has been stored in PCM. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump heater malfunction • PCM malfunction

Diagnostic procedure

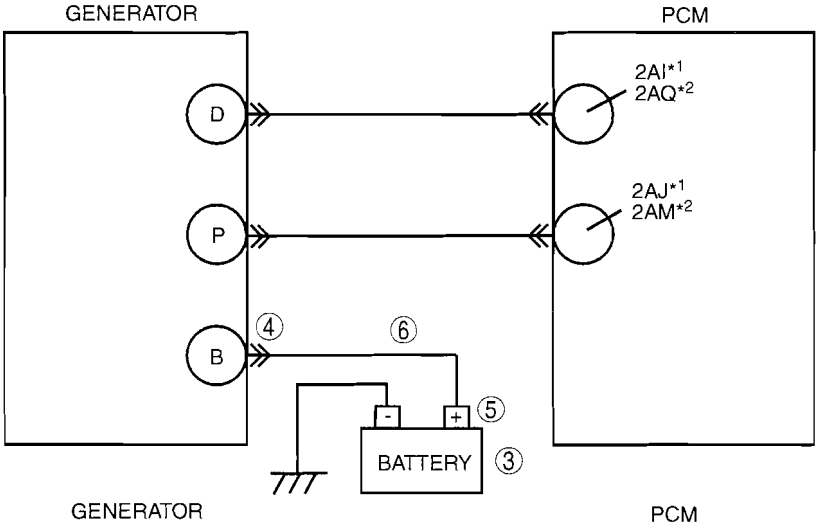
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP HEATER** • Perform EVAP system leak detection pump inspection. (See 01-16A-10 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3].) • Is the EVAP system leak detection pump normal?	Yes	Replace the EVAP system leak detection pump, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the evaporative emission test using the M-MDS. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) • Is the same DTC present? **Note** • If evaporative system test function is not available, perform the following procedure: — Perform the EVAP System Repair Verification Drive Mode. (See 01-02A-17 OBD-II DRIVE MODE[LF, L3]) — Is the PENDING CODE the same as the DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

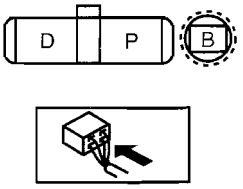
DTC P2502[LF, L3]

id0102a3814000

DTC P2502	Charging system voltage problem
DETECTION CONDITION	• The PCM judges generator output voltage is **above 17 V** or battery voltage is **below 11 V** during engine running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Open circuit between generator terminal B and battery positive terminal • Battery malfunction • Generator malfunction • PCM is poorly connected • PCM, generator and/or battery are poorly connected

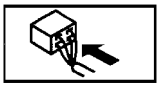


GENERATOR WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

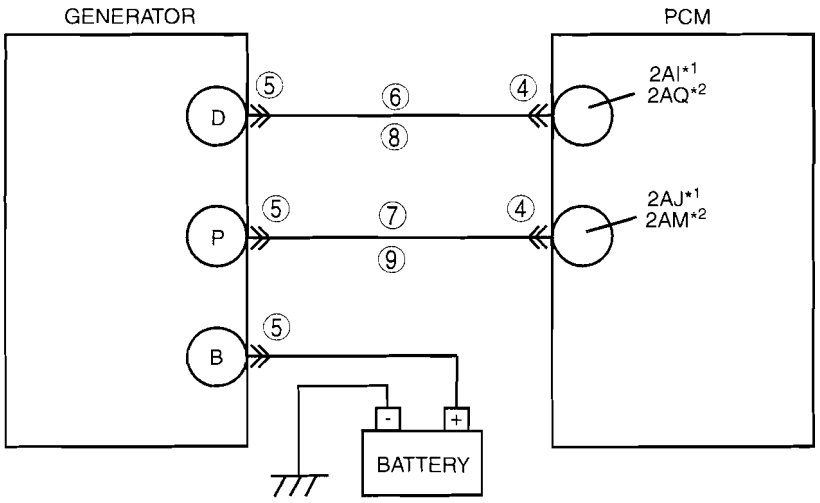
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BATTERY** • Turn the ignition switch off. • Inspect the battery. • Is the battery normal?	Yes	Go to the next step.
		No	Replace the battery, then go to Step 7.
4	**INSPECT POOR INSTALLATION OF GENERATOR TERMINAL** • Turn the ignition switch off. • Inspect for looseness of generator terminal B installation nut. • Is nut loose?	Yes	Tighten generator terminal B installation nut, then go to Step 7.
		No	Go to the next step.
5	**INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL** • Inspect for looseness of battery positive terminal. • Is the terminal loose?	Yes	Connect the battery positive terminal correctly, then go to Step 7.
		No	Go to the next step.
6	**INSPECT BATTERY CHARGING CIRCUIT** • Disconnect the generator terminal B. • Measure the voltage between generator terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between generator terminal B and battery positive terminal, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine, or KOER self-test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is there any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

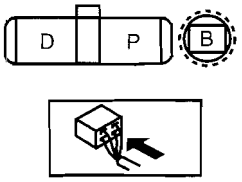
DTC P2503[LF, L3]

id0102a3814100

DTC P2503	Charging system voltage low
DETECTION CONDITION	• The PCM needs **more than 20 A** from generator, and judges generator output voltage to be **below 8.5 V** during engine running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • PCM and/or generator are poorly connected • Open and/or short to ground in wiring from between generator terminal P and PCM terminal 2AJ*1, 2AM*2, 2AJ*3 • Open and/or short to ground in wiring from between generator terminal D and PCM terminal 2AI*1, 2AQ*2, 2AI*3 • Drive chain misadjustment



GENERATOR WIRING HARNESS-SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

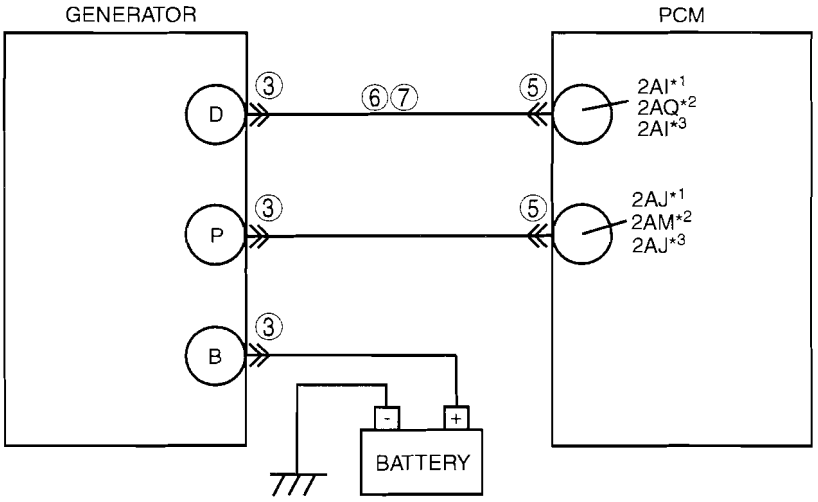
STEP	INSPECTION		ACTION
3	**INSPECT DRIVE CHAIN CONDITION** • Verify that drive chain auto tensioner indicator mark does not exceed limit. • Is front drive chain normal?	Yes	Go to the next step.
		No	Replace and/or adjust drive chain, then go to Step 10.
4	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn the ignition switch off. • Disconnect PCM connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair the terminals, then go to Step 10.
		No	Go to the next step.
5	**INSPECT POOR CONNECTION OF GENERATOR CONNECTOR** • Disconnect generator connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 10.
		No	Go to the next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal P (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
8	**INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN** • Inspect for continuity between generator terminal D (wiring harness-side) and PCM terminal 2AI*1, 2AQ*2 (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 10.
9	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between generator terminal P (wiring harness-side) and PCM terminal 2AJ*1, 2AM*2 (wiring harness-side). • Is there continuity?	Yes	Repair or replace the generator, then go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

*1 : LF MTX, L3 and California emission regulation applicable model with LF ATX
*2 : Except for California emission regulation applicable model with LF ATX

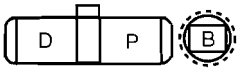
DTC P2504[LF, L3]

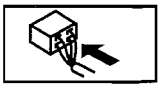
id0102a3814200

DTC P2504	Charging system voltage high
DETECTION CONDITION	• The PCM judges generator output voltage is **above 18.5 V** or battery voltage is **above 16.0 V** during engine running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Short to power circuit between generator connector terminal D and PCM connector terminal 2AI*1, 2AQ*2, 2AI*3 • Generator malfunction • PCM and/or generator are poorly connected



GENERATOR
WIRING HARNESS-SIDE CONNECTOR

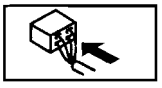




PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable model
*2 : Except for california emission regulation applicable model with LF ATX
*3 : Except for california emission regulation applicable model with LF MTX, L3

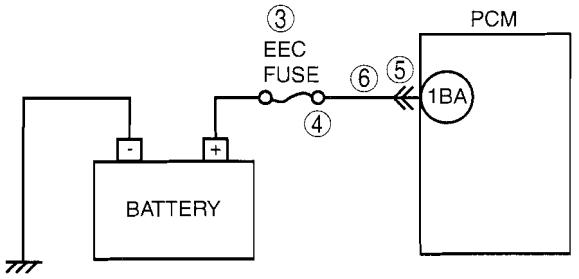
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT POOR CONNECTION OF GENERATOR CONNECTOR** • Turn the ignition switch off. • Disconnect the generator connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 8.
		No	Go to the next step.
4	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn the ignition switch to the ON (Engine off). • Measure the voltage between generator terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	There is a malfunction at the generator. Go to Step 7.
5	**INSPECT POOR CONNECTION OF PCM CONNECTOR** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace pins, then go to Step 8.
		No	Go to the next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON (engine off). • Measure the voltage between generator terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 8.
		No	Go to Step 8.
7	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER** • Measure the voltage between generator terminal D (part-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the generator, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine, or KOER self-test with M-MDS. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2507[LF, L3]

id0102a3814300

DTC P2507	PCM B+ voltage low
DETECTION CONDITION	• The PCM monitors the voltage of back-up battery positive terminal at PCM terminal 1BA. If the PCM detected battery positive terminal voltage **below 2.5 V** for **2 s**, the PCM determines that the backup voltage circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition during first drive cycle. • PENDING CODE is available if PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory.
POSSIBLE CAUSE	• Meltdown EEC fuse • Open circuit in wiring between EEC fuse and PCM terminal 1BA • Short to ground between EEC fuse and PCM terminal 1BA • Poor connection of PCM connector • PCM malfunction



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME PID DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Check for related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT EEC FUSE** • Turn the ignition switch off. • Inspect EEC fuse for failure and proper. • Is it normal?	Yes	Go to Step 6.
		No	• If EEC fuse has been burnt, then go to the next step. • If EEC fuse is not installed correctly, install it correctly then go to Step 7.
4	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect battery cables. • Inspect for continuity between EEC fuse terminal and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground and install new fuse, then go to Step 7.
		No	Go to Step 7.

STEP	INSPECTION		ACTION
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect PCM connector. • Inspect for poor connection (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminals, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect battery cables. • Inspect for continuity between EEC fuse terminal and PCM terminal 1BA (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P2610[LF, L3]

id0102a3814400

DTC P2610	PCM internal engine off timer performance
DETECTION CONDITION	• PCM internal engine off timer is damaged. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal engine off timer is damaged.

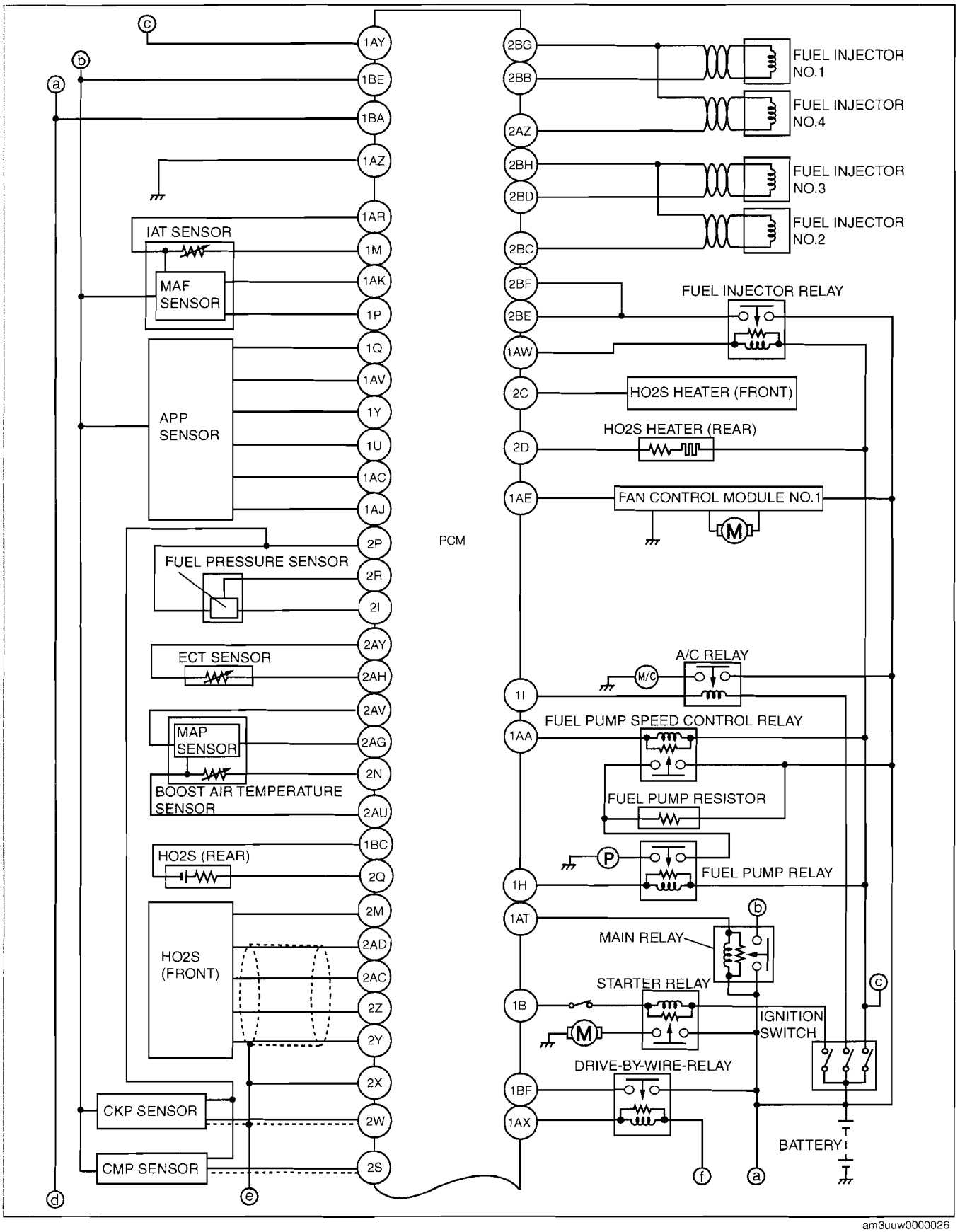
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2610 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

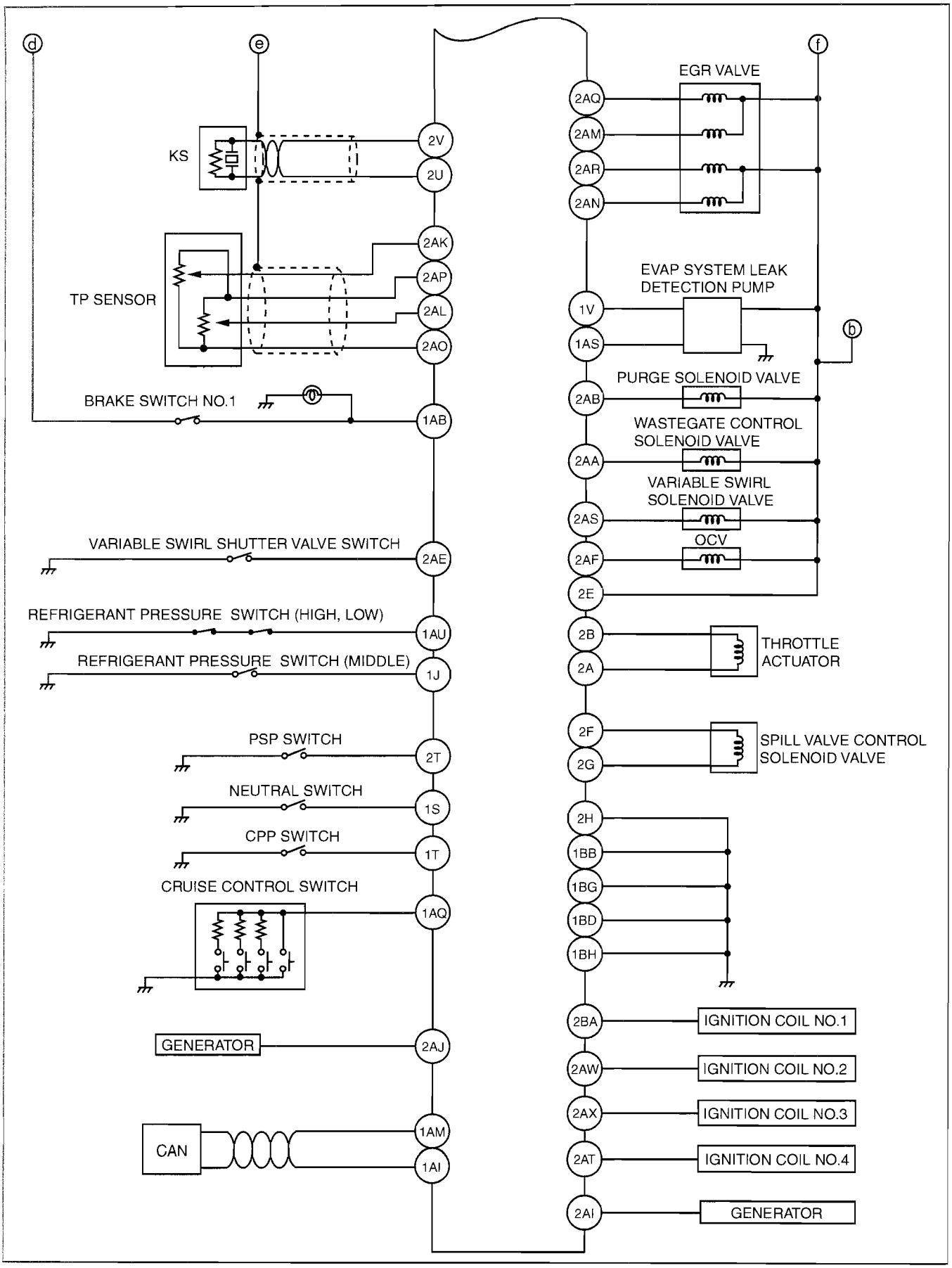
01-02B ON-BOARD DIAGNOSTIC [L3 WITH TC]

ON-BOARD DIAGNOSTIC WIRING DIAGRAM[L3 WITH TC]

id010239800100



am3uuw0000026



am3uuw0000012

MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART[L3 WITH TC]

id010239800200

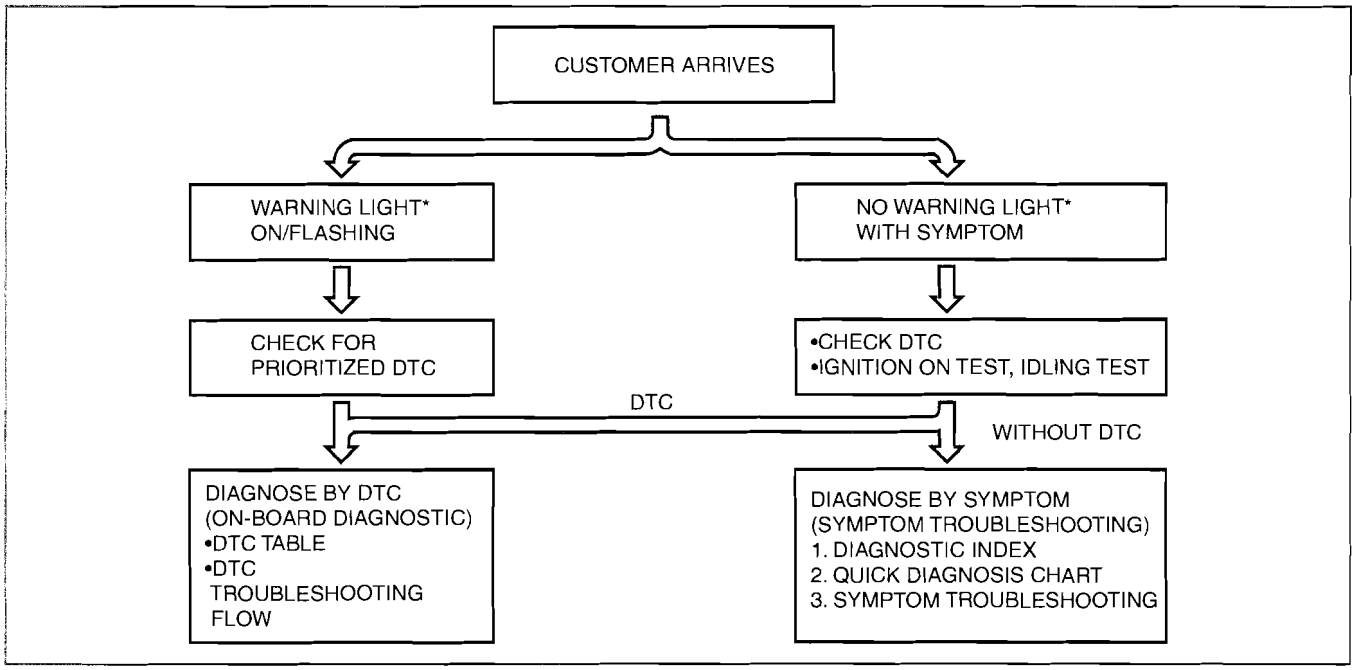
×: Applicable

Component	Oxygen sensor monitor	Oxygen sensor heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	Evaporative system monitor	EGR system monitor	Engine cooling system
Input								
Battery		x		x		x		
Ignition switch	x	x				x		
A/C switch, refrigerant pressure switch (high, low pressure)							x	x
TP sensor	x		x	x	x	x	x	
ECT sensor	x	x	x	x	x	x	x	x
IAT sensor	x		x		x	x	x	x
MAF sensor	x	x	x	x	x		x	x
HO2S (front)	x	x	x		x			
HO2S (rear)	x	x	x		x			
Fuel gauge sender unit						x		
BARO sensor	x					x		
MAP sensor							x	
CMP sensor				x				
CKP sensor	x	x	x	x	x	x	x	x
VSS	x					x	x	x
Output								
Fuel injector					x			
HO2S heater (front)		x						
HO2S heater (rear)		x						
EGR valve							x	
Purge solenoid valve	x		x		x	x		
EVAP system leak detection pump						x		
MIL	x	x	x	x	x	x	x	x
DLC-2	x	x	x	x	x	x	x	x

FOREWORD[L3 WITH TC]

id010239800300

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
  - — If a DTC does not exist and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03B-8 QUICK DIAGNOSTIC CHART[L3 WITH TC].)



acxuuw00002404

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

OBD-II PENDING TROUBLE CODE[L3 WITH TC]

id010239800400

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the PCM determines that the system has returned to normal or the problem was mistakenly detected, it deletes the pending code. If the problem is found in the second drive cycle, too the PCM determines that the system is malfunctioning, and the DTC is stored.

OBD-II FREEZE FRAME DATA[L3 WITH TC]

id010239800500

- This is technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of the Misfire or Fuel System DTCs. Once freeze frame data for the Misfire or Fuel System DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD-II ON-BOARD SYSTEM READINESS TEST[L3 WITH TC]

id010239800600

- This shows the OBD-II systems operating status. If any monitor function is incomplete, the M-MDS will identify which monitor function has not been completed. Misfires, Fuel System and Comprehensive Components (CCM) are continuous monitoring-type functions. The catalyst, EGR system, evaporation system and oxygen sensor will be monitored under drive cycles. The OBD-II diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD-II DIAGNOSTIC MONITORING TEST RESULTS[L3 WITH TC]

id010239800700

- These result from the intermittent monitor system technical data, which are used to determine whether the system is normal or not. They also display the system's thresholds and diagnostic results. The intermittent monitor system monitors the oxygen sensor, EVAP purge system, catalyst and the EGR system.

OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS[L3 WITH TC]

id010239800800

- This retrieves all stored DTCs in the PCM and clears the DTC, Freeze Frame Data, On-Board Readiness Test Results, Diagnostic Monitoring Test Results and Pending Trouble Codes.

OBD-II PARAMETER IDENTIFICATION (PID) ACCESS[L3 WITH TC]

id010239800900

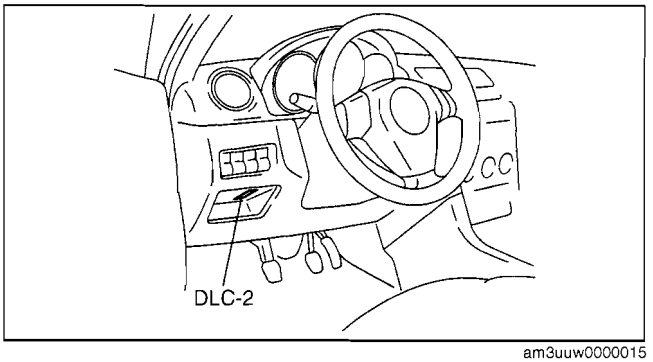
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST[L3 WITH TC]

id010239801000

DTC Reading Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".

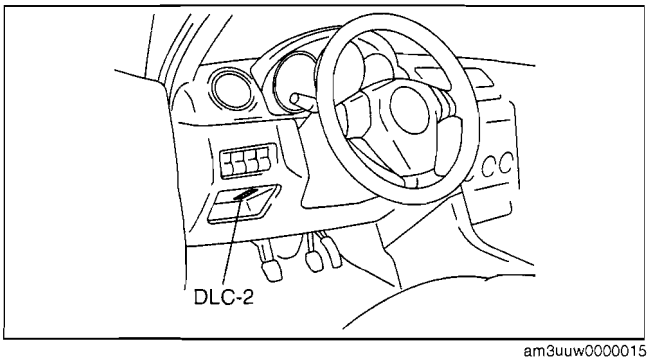


am3uuw0000015

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Verify the DTC according to the directions on the M-MDS screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".

Pending Trouble Code Access Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".

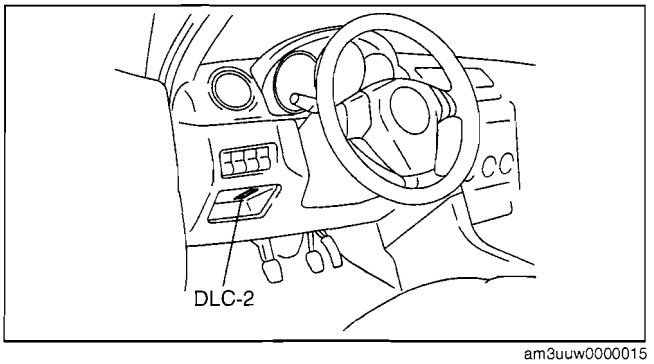


am3uuw0000015

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Retrieve the pending trouble codes according to the directions on the M-MDS screen.

Freeze Frame PID Data Access Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".

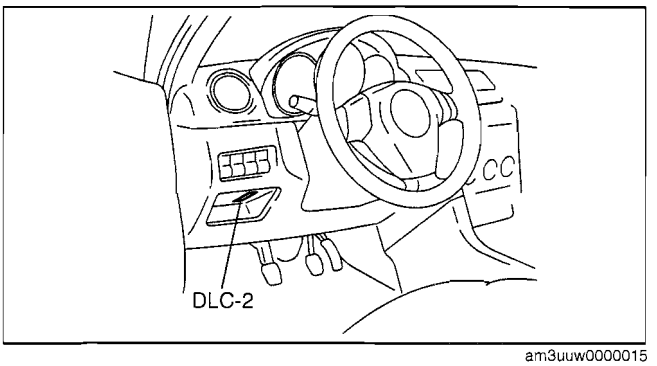


am3uuw0000015

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Retrieve the freeze frame PID data according to the directions on the M-MDS screen.

On-Board System Readiness Tests Access Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Powertrain".
     3. Select "OBD Test Modes".
     4. Select "Mode 1 Powertrain Data".
   - When using the PDS (Pocket PC)
     1. Select "OBD II Modes".
     2. Select "Mode 1 Powertrain Data".
3. Then, select the "***SUP" and "***EVAL" PIDs in the PID selection screen.
4. Monitor those PIDs and check it system monitor is completed.

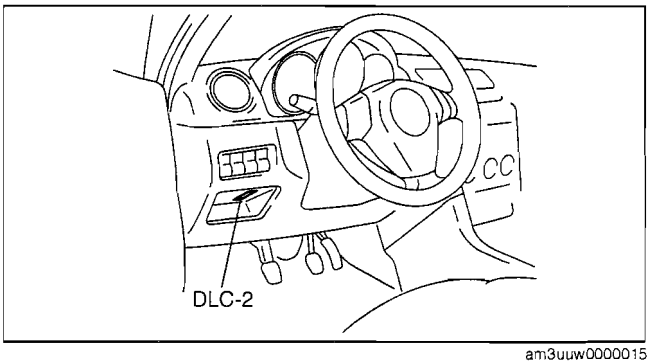


am3uuw0000015

PID/DATA Monitor and Record Procedure

Note
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.

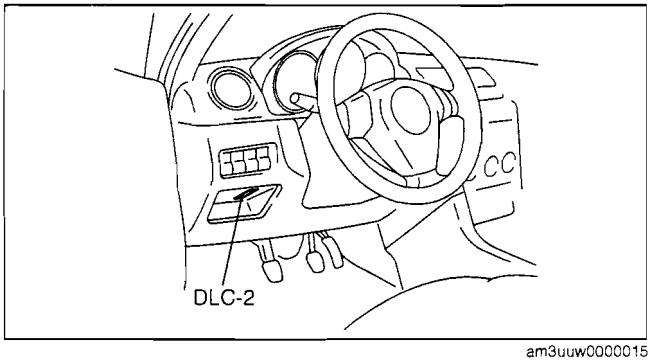
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "DataLogger".
3. Select the PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000015

Diagnostic Monitoring Test Results Access Procedure

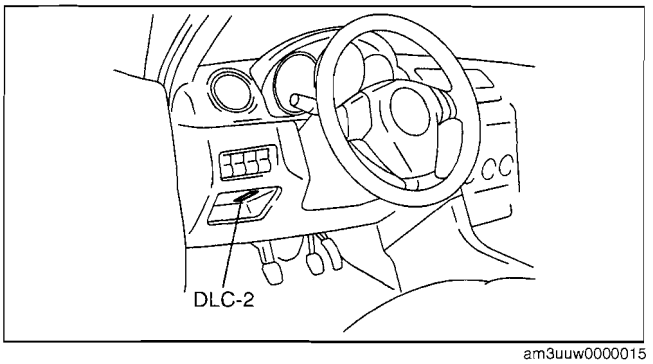
1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Powertrain".
     3. Select "OBD Test Modes".
     4. Select "Mode 6 On-Board Test Results".
   - When using the PDS (Pocket PC)
     1. Select "OBD II Modes".
     2. Select "Mode 6 On-Board Test Results".
3. Verify the diagnostic monitoring test result according to the directions on the screen.



am3uuw0000015

Simulation Function Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "DataLogger".
3. Select the simulation items from the PID table.
4. Perform the simulation function, inspect the operations for each parts.
   - If there is no operation sound from the relay, motor, and solenoid after the simulation function inspection is performed, it is possible that there is an open or short circuit in the wiring harness, relay, motor or solenoid, or sticking and operation malfunction.

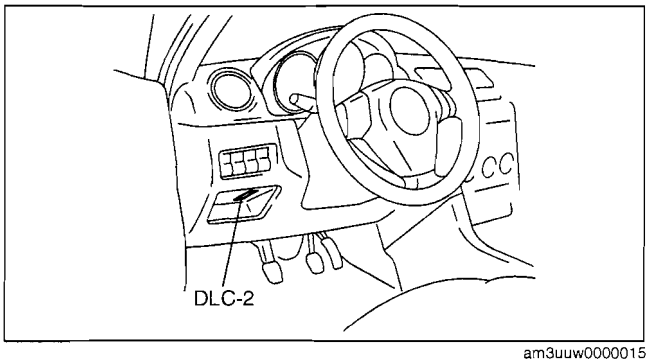


am3uuw0000015

AFTER REPAIR PROCEDURE[L3 WITH TC]

id010239801100

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
     5. Select "Retrieve CMDTCs".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
     4. Select "Retrieve CMDTCs".
3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.

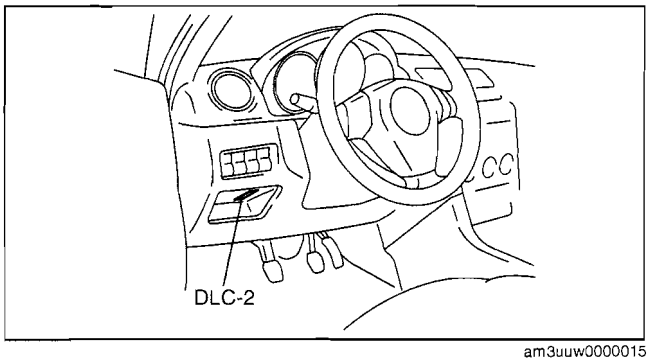


am3uuw0000015

KOEO/KOER SELF TEST[L3 WITH TC]

id010239801200

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "Self Test".
3. Then, select the "KOEO On Demand Self Test" or "KOER On Demand Self Test" and perform procedures according to directions on the M-MDS screen.
4. Verify the DTC according to the directions on the M-MDS screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".



am3uuw0000015

OBD-II DRIVE MODE[L3 WITH TC]

id010239801300

- Using the OBD-II drive mode, the monitoring item requested by OBD-II regulations can be easily diagnosed.
- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- The OBD-II drive mode is divided into the specific drive mode and single drive mode.
- For the specific drive mode, specified drive modes have been set for each individual monitoring item requested by OBD-II regulations, and they can be diagnosed individually. For the single drive mode, the entire monitoring item requested by OBD-II regulations can be diagnosed.
- The following modes are in the specific drive mode. The applicable system is diagnosed by driving in the following drive modes.
  - PCM Adaptive Memory Produce Drive Mode
  - EGR System Repair Verification Drive Mode
  - HO2S heater, HO2S, and TWC Repair Verification Drive Mode
  - EVAP System Repair Verification Drive Mode
- The following systems are diagnosed with the single drive mode.
  - EGR system
  - Oxygen sensor (HO2S)
  - Oxygen sensor heater
  - Catalytic converter (TWC)
  - Fuel, misfire and evaporative (EVAP) system

Caution

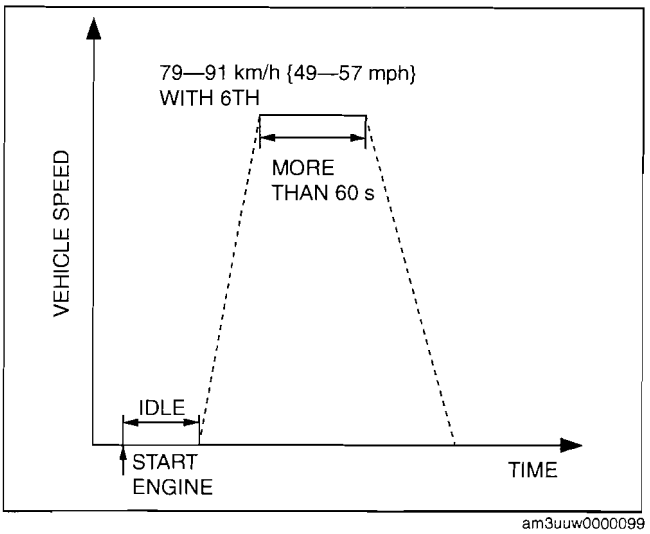
- **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.**
- **When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD function and inspect later.**

Note

- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the M-MDS to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - The OBD-II system detects the malfunction.
  - The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The M-MDS can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.
- The OBD monitoring status can be confirmed with the ignition switch operation. During KOEO, the MIL illuminates for a fail-light inspection for **approx. 17 s**. The OBD monitoring status is confirmed after the fail-light inspection.
  - If all of the diagnosis is completed even one time, the MIL will continue to illuminate.
  - If all of the diagnosis is not completed, the MIL flashes for **approx. 7 s**, and then it illuminates until the engine is started.

EGR System Repair Verification Drive Mode

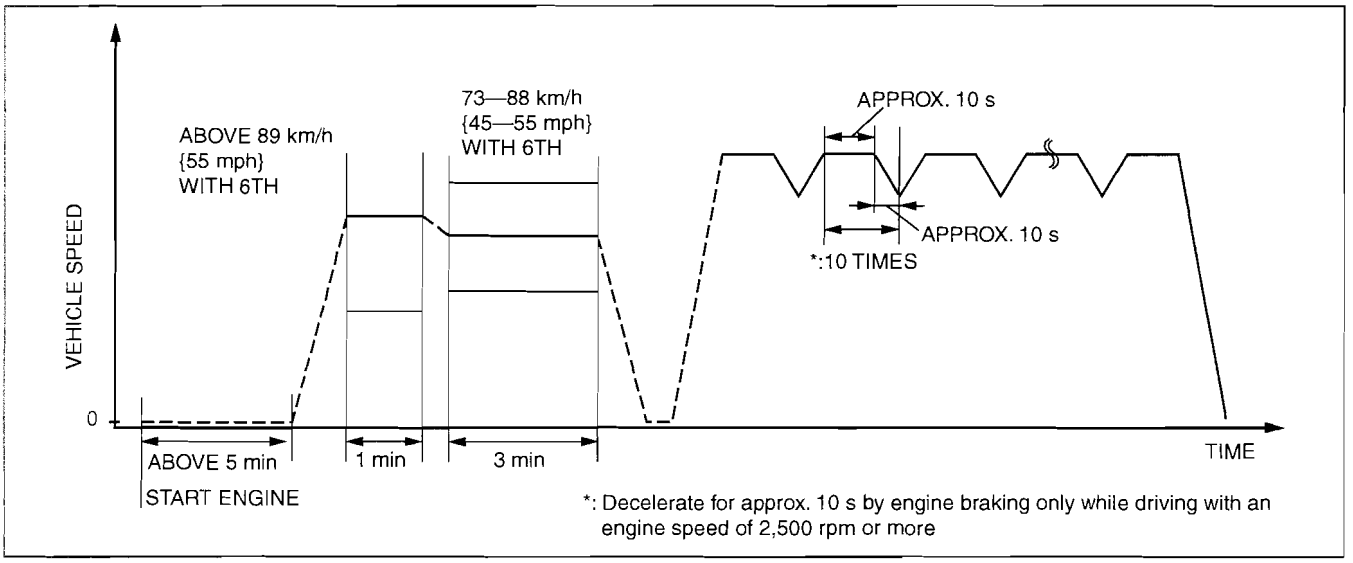
1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.
4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within specification, repair has not been completed.
6. Verify no DTCs are available.



am3uuw0000099

HO2S heater, HO2S, and TWC Repair Verification Drive Mode

1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified.



am3uuw0000099

4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
   - If completed, the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
   - If detected values are not within the specification, repair has not been completed.
6. Verify no DTCs are available.

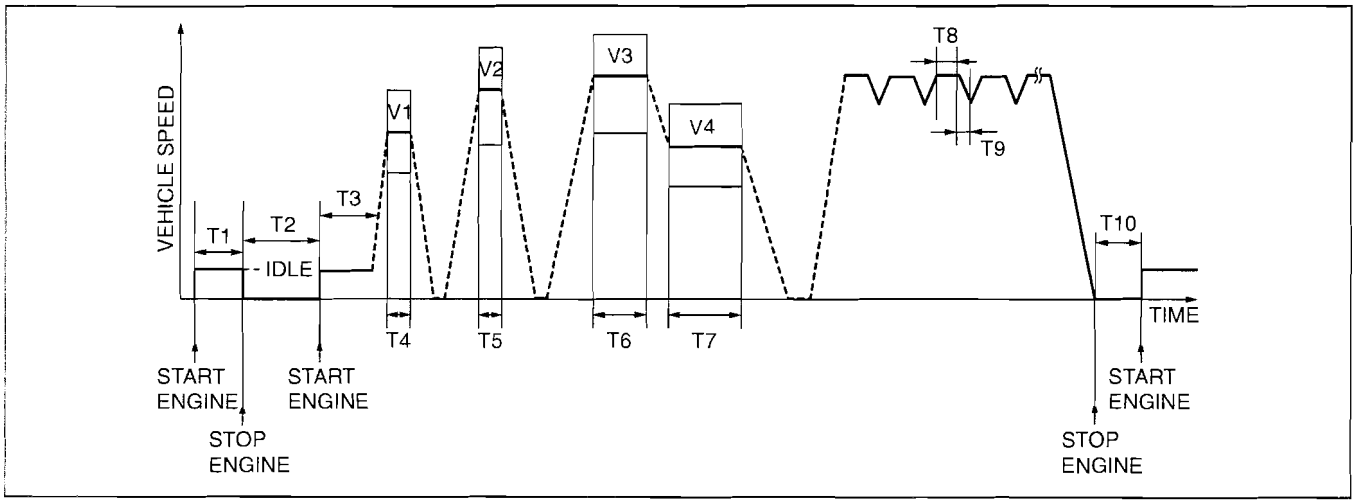
EVAP System Repair Verification Drive Mode

Note
- If "EVAP System Repair Verification Drive Mode" cannot be performed (it is impossible to drive the vehicle under this drive mode condition), perform the EVAP system test procedure as an alternative.

1. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications before the engine is started to initiate the EVAP system test.
   - BARO: **above 72.2 kPa {542 mmHg, 21.3 inHg}**
   - IAT: **5—35 °C {41—95 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
2. Clear the DTC from the PCM memory using the M-MDS.
3. Turn the ignition switch off.
4. Leave the vehicle for **5 hours or more.**
5. Start the engine and idle it for **more than 5 min.**
6. Drive the vehicle at an engine speed of **65—80 km/h {40—50 mph} for more than 5 min.**
7. Stop the vehicle and the turn ignition switch off.
8. Leave vehicle as it is for **5.5 hours or more.**
9. Start the engine.
10. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
    - If completed, the OBD monitoring status items change from non-completed to completed.
    - If not completed, turn the ignition switch off then go back to Step 1.
11. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
    - If detected values are not within specification, the repair has not been completed.
12. Verify that no DTCs are present.

PCM Adaptive Memory Production, EGR, HO2S heater, HO2S, TWC, and EVAP System Repair Verification Drive Mode

1. Start the engine and warm it up completely.
2. Clear the DTC from the PCM memory using the M-MDS.
3. Verify the following conditions and correct if necessary:
   - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
4. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications from Step 5 to 6.
   - BARO: **above 72.2 kPa {542 mmHg, 21.3 inHg}**
   - IAT: **5—35 °C {41—95 °F}**
   - FTL: **15—85%**
   - B+: **above 10.9 V**
5. With the vehicle stopped, race the engine at the engine speed indicated, and then drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified. If possible, monitor RPM PID for engine speed during this procedure.



acxuuw00002357

Step	Time	Engine speed (rpm)	Vehicle speed (km/h {mph})	Vehicle condition
1	T1: More than 10 s	Idle	0 {0}	Idle the engine after the cooling fan has stopped
2	T2: More than 5 h	0	0 {0}	Keep the ignition switch off
3	T3: More than 5 min	Idle	0 {0}	—
4	T4: 5 min	—	V1: 65—80 {40—50}	6th
5	T5: 1 min	—	V2: 79—91 {49—57}	6th
6	T6: 1 min	—	V3: Above 89 {55}	6th
7	T7: 3 min	—	V4: 72—88 {45—55}	6th
8	T8: Approx. 10 s	2,500 or more	—	—
9	T9: Approx. 10 s	—	—	Decelerate by engine braking only (10 times)
10	T10: More than 5.5 h	0	0 {0}	Keep the ignition switch off

6. Turn the ignition switch off.
7. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
   - If completed, all of the OBD monitoring status items change from non-completed to completed.
   - If not completed, turn the ignition switch off, then perform the applicable specific drive mode for any monitoring item that was not in the detection condition.
8. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
   - If detected values are not within specification, the repair has not been completed.

DIAGNOSTIC MONITORING TEST RESULTS[L3 WITH TC]

id010239801400

- The purpose of this test mode is to confirm the result of the OBD-II monitor diagnostic test results. The result values stored when a particular monitor is completed are displayed. If the monitor is not completed, the initial value is displayed.

TEST ID	Description	Related system
10: 01: 80	HO2S (Front) lean-to-rich response time (calculated)	HO2S
10: 01: 81	HO2S (Front) rich-to-lean response time (calculated)	
10: 01: 82	HO2S (Front) lean-to-rich response time (calculated)	
10: 01: 83	HO2S (Front) rich-to-lean response time (calculated)	
10: 02: 03	Low HO2S (Rear) voltage for switch time calculation (constant)	
10: 02: 04	High HO2S (Rear) voltage for switch time calculation (constant)	
10: 02: 05	HO2S (Rear) rich-to-lean response time (calculated)	
10: 21: 80	Front and HO2S (Rear) switching time ratio	Catalyst
10: 31: 83	EGR pressure variation	EGR
10: 3A: 80	EVAP system leak detection pump gross leak check	EVAP
10: 3B: 80	EVAP system leak detection pump small leak check	
10: 3C: 80*1	EVAP system leak detection pump very small leak check	
10: 3D: 80	Purge flow monitor	
10: A2: 0B	EWMA misfire counts for last 10 driving cycles	Misfire
10: A2: 0C	Misfire counts for last/current driving cycles	
10: A3: 0B	EWMA misfire counts for last 10 driving cycles	
10: A3: 0C	Misfire counts for last/current driving cycles	
10: A4: 0B	EWMA misfire counts for last 10 driving cycles	
10: A4: 0C	Misfire counts for last/current driving cycles	
10: A5: 0B	EWMA misfire counts for last 10 driving cycles	
10: A5: 0C	Misfire counts for last/current driving cycles	
10: E1: 80	Heat radiation ratio	Engine cooling system
10: E1: 81	Misfire counts for last/current driving cycles	

*1 : California emission regulation applicable model

DTC TABLE[L3 WITH TC]

id010239801500

×: Applicable
—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
B1342	PCM malfunction	OFF	1	Other	C, O	×	(See01-02B-23 DTC B1342[L3 WITH TC].)
P0011	CMP Timing over-advanced	ON	1	CCM	C, R	×	(See01-02B-23 DTC P0011[L3 WITH TC].)
P0012	CMP Timing over-retarded	ON	2	CCM	C, R	×	(See01-02B-25 DTC P0012[L3 WITH TC].)
P0016	CKP-CMP correlation	ON	2	CCM	C	×	(See01-02B-26 DTC P0016[L3 WITH TC].)
P0030	Front HO2S heater control circuit problem	ON	2	HO2S heater	C, O, R	×	(See01-02B-28 DTC P0030[L3 WITH TC].)
P0031	Front HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See01-02B-30 DTC P0031[L3 WITH TC])
P0032	Front HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(See01-02B-32 DTC P0032[L3 WITH TC].)
P0037	Rear HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See01-02B-34 DTC P0037[L3 WITH TC].)
P0038	Rear HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(Se01-02B-36 DTC P0038[L3 WITH TC].)
P0069	Manifold absolute pressure/ atmospheric pressure correlation	ON	2	CCM	C	×	(See01-02B-38 DTC P0069[L3 WITH TC].)
P0089	Fuel pressure regulator performance	OFF	1	Other	C, O, R	×	(See01-02B-39 DTC P0089[L3 WITH TC].)
P0091	Fuel pressure regulator control circuit low	ON	1	CCM	C, O, R	×	(See01-02B-40 DTC P0091[L3 WITH TC])
P0092	Fuel pressure regulator control circuit high	ON	1	CCM	C, O, R	×	(See01-02B-42 DTC P0092[L3 WITH TC].)
P0096	IAT sensor 2 circuit range/ performance problem	ON	2	CCM	C	×	(See01-02B-44 DTC P0096[L3 WITH TC].)
P0097	IAT sensor 2 circuit low	ON	1	CCM	C, O, R	×	(See01-02B-46 DTC P0097[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P0098	IAT sensor 2 circuit high	ON	1	CCM	C, O, R	×	(See01-02B-48 DTC P0098[L3 WITH TC].)
P0101	MAF circuit range/performance problem	ON	2	CCM	C	×	(See01-02B-50 DTC P0101[L3 WITH TC].)
P0102	MAF circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-52 DTC P0102[L3 WITH TC].)
P0103	MAF circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-54 DTC P0103[L3 WITH TC].)
P0107	MAP sensor circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-56 DTC P0107[L3 WITH TC].)
P0108	MAP sensor circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-58 DTC P0108[L3 WITH TC].)
P0111	IAT circuit performance problem	ON	2	CCM	C	×	(See01-02B-60 DTC P0111[L3 WITH TC].)
P0112	IAT circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-61 DTC P0112[L3 WITH TC].)
P0113	IAT circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-62 DTC P0113[L3 WITH TC].)
P0116	ECT circuit range/performance problem	ON	1	Engine cooling system	C	×	(See01-02B-64 DTC P0116[L3 WITH TC].)
P0117	ECT circuit low input	ON	1	Engine cooling system	C, O, R	×	(See01-02B-66 DTC P0117[L3 WITH TC].)
P0118	ECT circuit high input	ON	1	Engine cooling system	C, O, R	×	(See01-02B-68 DTC P0118[L3 WITH TC].)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-70 DTC P0122[L3 WITH TC].)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-72 DTC P0123[L3 WITH TC].)
P0125	Excessive time to enter closed loop fuel control	ON	2	Engine cooling system	C	×	(See01-02B-74 DTC P0125[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P0126	Coolant thermostat stuck open	ON	2	Engine cooling system	C	×	(See01-02B-75 DTC P0126, P0128[L3 WITH TC].)
P0128	Coolant thermostat stuck open	ON	2	Engine cooling system	C	×	
P0131	Front HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See01-02B-77 DTC P0131[L3 WITH TC].)
P0132	Front HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See01-02B-80 DTC P0132[L3 WITH TC].)
P0133	Front HO2S circuit problem	ON	2	HO2S	C	×	(See01-02B-82 DTC P0133[L3 WITH TC].)
P0134	Front HO2S circuit no activity detected	ON	2	HO2S	C, R	×	(See01-02B-84 DTC P0134[L3 WITH TC].)
P0137	Rear HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See01-02B-87 DTC P0137[L3 WITH TC].)
P0138	Rear HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See01-02B-89 DTC P0138[L3 WITH TC].)
P0139	Rear HO2S circuit malfunction	ON	2	HO2S	C	×	(See01-02B-91 DTC P0139[L3 WITH TC].)
P0140	Rear HO2S circuit no activity detected	ON	2	HO2S	C, R	×	(See01-02B-93 DTC P0140[L3 WITH TC].)
P0192	Fuel rail pressure sensor circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-96 DTC P0192[L3 WITH TC].)
P0193	Fuel rail pressure sensor circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-98 DTC P0193[L3 WITH TC].)
P0201	Injector circuit/open cylinder No.1	ON	1	CCM	C, R	×	(See01-02B-100 DTC P0201[L3 WITH TC].)
P0202	Injector circuit/open cylinder No.2	ON	1	CCM	C, R	×	(See01-02B-102 DTC P0202[L3 WITH TC].)
P0203	Injector circuit/open cylinder No.3	ON	1	CCM	C, R	×	(See01-02B-104 DTC P0203[L3 WITH TC].)
P0204	Injector circuit/open cylinder No.4	ON	1	CCM	C, R	×	(See01-02B-106 DTC P0204[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P0222	TP sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-109 DTC P0222[L3 WITH TC].)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-111 DTC P0223[L3 WITH TC].)
P0234	Turbo/supercharger overboost condition	OFF	1	Other	C, R	×	(See01-02B-113 DTC P0234[L3 WITH TC].)
P0245	Turbocharger wastegate solenoid low	OFF	2	Other	C, O, R	×	(See01-02B-114 DTC P0245[L3 WITH TC].)
P0246	Turbocharger wastegate solenoid high	OFF	2	Other	C, O, R	×	(See01-02B-116 DTC P0246[L3 WITH TC].)
P0300	Random misfire detected	Flash / ON	1 or 2	Misfire	C, R	×	(See01-02B-118 DTC P0300[L3 WITH TC].)
P0301	Cylinder No.1 misfire detected	Flash / ON	1 or 2	Misfire	C, R	×	(See01-02B-122 DTC P0301, P0302, P0303, P0304[L3 WITH TC].)
P0302	Cylinder No.2 misfire detected	Flash / ON	1 or 2	Misfire	C, R	×	
P0303	Cylinder No.3 misfire detected	Flash / ON	1 or 2	Misfire	C, R	×	
P0304	Cylinder No.4 misfire detected	Flash / ON	1 or 2	Misfire	C, R	×	
P0327	Knock sensor circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-124 DTC P0327[L3 WITH TC].)
P0328	Knock sensor circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-126 DTC P0328[L3 WITH TC].)
P0335	CKP sensor circuit malfunction	ON	1	CCM	C	×	(See01-02B-128 DTC P0335[L3 WITH TC].)
P0340	CMP sensor circuit malfunction	ON	1	CCM	C	×	(See01-02B-130 DTC P0340[L3 WITH TC].)
P0401	EGR flow insufficient detected	ON	2	EGR	C, R	×	(See01-02B-133 DTC P0401[L3 WITH TC].)
P0403	EGR valve (stepper motor) circuit malfunction	ON	2	CCM	C, O, R	×	(See01-02B-135 DTC P0403[L3 WITH TC].)
P0421	Catalyst system efficiency below threshold	ON	2	Catalyst	C	×	(See01-02B-137 DTC P0421[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P0441	EVAP control system incorrect purge flow	ON	2	EVAP system monitor	C, R	×	(See01-02B-139 DTC P0441[L3 WITH TC].)
P0442	EVAP control system leak detected (small leak)	ON	2	EVAP system monitor	C, R	×	(See01-02B-141 DTC P0442[L3 WITH TC].)
P0443	EVAP control system purge control valve circuit malfunction	ON	2	CCM	C, O, R	×	(See01-02B-142 DTC P0443[L3 WITH TC].)
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	ON	2	CCM	C, R	×	(See01-02B-144 DTC P0446[L3 WITH TC].)
P0455	EVAP control system leak detected (gross leak)	ON	2	EVAP system monitor	C, R	×	(See01-02B-146 DTC P0455[L3 WITH TC].)
P0456*1	EVAP control system leak detected (very small leak)	ON	2	EVAP system monitor	C, R	×	(See01-02B-149 DTC P0456[L3 WITH TC].)
P0461	Fuel gauge sender unit circuit range/ performance	ON	2	CCM	C	×	(See01-02B-151 DTC P0461[L3 WITH TC].)
P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	C, O, R	×	(See01-02B-152 DTC P0462[L3 WITH TC].)
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	C, O, R	×	(See01-02B-153 DTC P0463[L3 WITH TC].)
P0480	Fan control circuit problem	OFF	1	Other	C, O, R	×	(See01-02B-154 DTC P0480[L3 WITH TC].)
P0500	Vehicle speed sensor (VSS) circuit malfunction	ON	2	CCM	C	×	(See01-02B-156 DTC P0500[L3 WITH TC].)
P0505	Idle control system malfunction	OFF	–	–	R	–	(See01-02B-157 DTC P0505[L3 WITH TC].)
P0506	Idle control system RPM lower than expected	ON	2	CCM	C	×	(See01-02B-158 DTC P0506[L3 WITH TC].)
P0507	Idle control system RPM higher than expected	ON	2	CCM	C	×	(See01-02B-160 DTC P0507[L3 WITH TC].)
P050A	Cold start idle air control system performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See01-02B-161 DTC P050A[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P050B	Cold start ignition timing performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See01-02B-162 DTC P050B[L3 WITH TC].)
P0550	PSP switch circuit malfunction	ON	2	CCM	C	×	(See01-02B-164 DTC P0550[L3 WITH TC].)
P0564	Cruise control switch circuit malfunction	OFF	1	Other	C	×	(See01-02B-166 DTC P0564[L3 WITH TC].)
P0571	Brake switch circuit malfunction	OFF	1	Other	C	×	(See01-02B-168 DTC P0571[L3 WITH TC].)
P0601	Internal control module memory check sum error	ON	1	CCM	C, O, R	×	(See01-02B-170 DTC P0601[L3 WITH TC].)
P0602	PCM programming error	ON	1	CCM	C, O, R	×	(See01-02B-171 DTC P0602[L3 WITH TC].)
P0604	PCM RAM error	ON	1	CCM	C, O, R	×	(See01-02B-172 DTC P0604[L3 WITH TC].)
P0606	PCM processor	ON	1	CCM	C, O, R	×	(See01-02B-172 DTC P0606[L3 WITH TC].)
P0607	Control module performance	OFF	1	Other	C, O, R	×	(See01-02B-173 DTC P0607[L3 WITH TC].)
P0610	Control module vehicle options error	ON	1	CCM	C, O, R	×	(See01-02B-174 DTC P0610[L3 WITH TC].)
P0638	Throttle actuator control range/ performance	ON	1	CCM	C	×	(See01-02B-175 DTC P0638[L3 WITH TC].)
P0703	Brake switch No.1 circuit malfunction	ON	2	CCM	C	×	(See01-02B-176 DTC P0703[L3 WITH TC].)
P0704	Clitch pedal position (CPP) switch circuit malfunction	ON	2	CCM	C	×	(See01-02B-179 DTC P0704[L3 WITH TC].)
P0850	Neutral switch circuit malfunction	ON	2	CCM	C	×	(See01-02B-181 DTC P0850[L3 WITH TC].)
P1260	Immobilizer system problem	OFF	–	Other	C, O	×	(See01-02B-184 DTC P1260[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P2004	Variable swirl control system shutter valve stuck open	ON	2	CCM	C, R	×	(See01-02B-185 DTC P2004[L3 WITH TC].)
P2006	Variable swirl control system shutter valve stuck closed	ON	2	CCM	C, R	×	(See01-02B-188 DTC P2006[L3 WITH TC].)
P2009	Variable swirl solenoid valve control circuit low	ON	2	CCM	C, O, R	×	(See01-02B-191 DTC P2009[L3 WITH TC].)
P2010	Variable swirl solenoid valve control circuit high	ON	2	CCM	C, O, R	×	(See01-02B-193 DTC P2010[L3 WITH TC].)
P2088	OCV actuator circuit low	ON	1	CCM	C, O, R	×	(See01-02B-194 DTC P2088[L3 WITH TC].)
P2089	OCV actuator circuit high	ON	1	CCM	C, O, R	×	(See01-02B-196 DTC P2089[L3 WITH TC].)
P2096	Target A/F feedback system too lean	ON	2	Fuel system	C	×	(See01-02B-198 DTC P2096[L3 WITH TC].)
P2097	Target A/F feedback system too rich	ON	2	Fuel system	C	×	(See01-02B-201 DTC P2097[L3 WITH TC].)
P2100	Throttle actuator circuit open	ON	1	CCM	C, O, R	×	(See01-02B-204 DTC P2100[L3 WITH TC].)
P2101	Throttle actuator circuit range/ performance	ON	1	CCM	C, R	×	(See01-02B-206 DTC P2101[L3 WITH TC].)
P2102	Throttle actuator circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-209 DTC P2102[L3 WITH TC].)
P2103	Throttle actuator circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-211 DTC P2103[L3 WITH TC].)
P2107	Throttle actuator control module processor problem	ON	1	CCM	C, R	×	(See01-02B-212 DTC P2107[L3 WITH TC].)
P2108	Throttle actuator control module performance problem	ON	1	CCM	C, R	×	(See01-02B-213 DTC P2108[L3 WITH TC].)
P2119	Throttle actuator control throttle body range/performance	ON	1	CCM	C, R	×	(See01-02B-214 DTC P2119[L3 WITH TC].)
P2122	Accelerator pedal position (APP) sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-215 DTC P2122[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P2123	Accelerator pedal position (APP) sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-217 DTC P2123[L3 WITH TC].)
P2126	Accelerator pedal position (APP) sensor No.2 circuit range/performance	ON	1	CCM	C, O, R	×	(See01-02B-219 DTC P2126[L3 WITH TC].)
P2127	Accelerator pedal position (APP) sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-220 DTC P2127[L3 WITH TC].)
P2128	Accelerator pedal position (APP) sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-222 DTC P2128[L3 WITH TC].)
P2135	Throttle position sensor No.1/No.2 voltage correlation problem	ON	1	CCM	C, O, R	×	(See01-02B-224 DTC P2135[L3 WITH TC].)
P2138	Accelerator pedal position (APP) sensor No.1/No.2 voltage correlation problem	ON	1	CCM	C, O, R	×	(See01-02B-225 DTC P2138[L3 WITH TC].)
P2177	Fuel system too lean at off idle	ON	2	Fuel system	C, R	×	(See01-02B-226 DTC P2177[L3 WITH TC].)
P2178	Fuel system too rich at off idle	ON	2	Fuel system	C, R	×	(See01-02B-229 DTC P2178[L3 WITH TC].)
P2187	Fuel system too lean at idle	ON	2	Fuel system	C, R	×	(See01-02B-232 DTC P2187[L3 WITH TC].)
P2188	Fuel system too rich at idle	ON	2	Fuel system	C, R	×	(See01-02B-235 DTC P2188[L3 WITH TC].)
P2195	Front HO2S signal stuck lean	ON	2	HO2S	C	×	(See01-02B-238 DTC P2195[L3 WITH TC].)
P2196	Front HO2S signal stuck rich	ON	2	HO2S	C	×	(See01-02B-240 DTC P2196[L3 WITH TC].)
P2228	BARO sensor circuit low input	ON	1	CCM	C, O, R	×	(See01-02B-243 DTC P2228[L3 WITH TC].)
P2229	BARO sensor circuit high input	ON	1	CCM	C, O, R	×	(See01-02B-244 DTC P2229[L3 WITH TC].)
P2237	Front HO2S positive current control circuit open	ON	2	HO2S	C, O, R	×	(See01-02B-244 DTC P2237[L3 WITH TC].)
P2245	Front HO2S sensor reference voltage circuit low input	ON	2	HO2S	C, O, R	×	(See01-02B-246 DTC P2245[L3 WITH TC].)

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*2	Memory function	Page
P2246	Front HO2S sensor reference voltage circuit high input	ON	2	HO2S	C, O, R	×	(See01-02B-248 DTC P2246[L3 WITH TC].)
P2251	Front HO2S negative current control circuit open	ON	2	HO2S	C, O, R	×	(See01-02B-250 DTC P2251[L3 WITH TC].)
P2401	EVAP system leak detection pump motor circuit low	ON	2	CCM	C, R	×	(See01-02B-252 DTC P2401[L3 WITH TC].)
P2402	EVAP system leak detection pump motor circuit high	ON	2	CCM	C, R	×	(See01-02B-255 DTC P2402[L3 WITH TC].)
P2404	EVAP system leak detection pump sensor circuit malfunction	ON	2	CCM	C, R	×	(See01-02B-257 DTC P2404[L3 WITH TC].)
P2405	EVAP system leak detection pump sensor circuit low input	ON	2	CCM	C, R	×	(See01-02B-258 DTC P2405[L3 WITH TC].)
P2407	EVAP system leak detection pump sensor circuit intermittent	ON	2	CCM	C, R	×	(See01-02B-259 DTC P2407[L3 WITH TC].)
P2502	Generator terminal B circuit open	OFF	1	Other	C, R	×	(See01-02B-260 DTC P2502[L3 WITH TC].)
P2503	Generator output voltage signal no electricity	OFF	1	Other	C, R	×	(See01-02B-262 DTC P2503[L3 WITH TC].)
P2504	Battery overcharge	OFF	1	Other	C, R	×	(See01-02B-264 DTC P2504[L3 WITH TC].)
P2507	PCM +BB (back-up battery) voltage low	ON	1	CCM	C, O, R	×	(See01-02B-266 DTC P2507[L3 WITH TC].)
P2610	PCM internal engine off timer performance	ON	2	CCM	C	×	(See01-02B-268 DTC P2610[L3 WITH TC].)
U0073	Control module communication Bus off	(See09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0121	Communication error to ABS HU/CM	(See09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0155	Communication error to instrument cluster	(See09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					

*1 : California emission regulation applicable model
*2 : C; CMDTC self-test, O; KOEO self-test, R; KOER self-test

DTC B1342[L3 WITH TC]

id010239815700

DTC B1342	PCM malfunction
DETECTION CONDITION	• Malfunction in the PCM internal circuit.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY CURRENT STATUS OF MALFUNCTION** • Clear the DTC from the PCM memory using the M-MDS. • Is same DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
2	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0011[L3 WITH TC]

id010239801600

DTC P0011	CMP Timing over-advanced
DETECTION CONDITION	• Actual valve timing is over-advanced by **17** ° (when the following conditions are met) from the target valve timing when the OCV is controlled at the maximum valve timing retard condition. **MONITORING CONDITION** — Engine speed is **below 4,000 rpm.** — Engine coolant temperature is **70—110 °C {158—230 °F}.** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• OCV malfunction • Spool valve in the OCV is stuck in the advance position. • Variable valve timing actuator is stuck in the advance position. • Loose timing chain or improper valve timing due to timing chain slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TIMING CHAIN INSTALLATION** • Stop the engine. • Remove the timing chain cover. • Is the camshaft timing mark at the correct point? (See 01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].)	Yes	Go to the next step.
		No	Reinstall the timing chain, then go to Step 7.

STEP	INSPECTION		ACTION
4	**INSPECT OCV FOR MALFUNCTION** • Start the engine. • Increase the engine speed. • Stop the engine. • Remove the OCV. • Inspect the position of the spool valve in the OCV. • Is the spool valve located at the valve retard position?	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 7.
5	**INSPECT STOPPER PIN MECHANISM** • Remove the timing chain. • Inspect the stopper pin. (See 01-10B-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[L3 WITH TC].) • Is the stopper pin mechanism normal?	Yes	Go to the next step.
		No	Replace the variable valve timing actuator, then go to Step 7.
6	**INSPECT ROTOR POSITION** • Remove the variable valve timing actuator. • Is the rotor position at the maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected as an intermittent concern. • The intermittent concern might be removed using the cleaning mode of the variable valve timing control function. Go to the next step.
		No	Replace the variable valve timing actuator, go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0012[L3 WITH TC]

id010239801700

DTC P0012	CMP Timing over-retarded
DETECTION CONDITION	• Actual valve timing is over-retarded by **5** ° (when the following conditions are met) from the target valve timing for **5 s** when the OCV system control is within the feed-back range. **MONITORING CONDITION** — Engine speed is **below 4,000 rpm.** — Engine coolant temperature is **70—110 °C {158—230 °F}.** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• OCV malfunction • Low engine oil pressure • Spool valve in OCV is stuck in the retard position. • Variable valve timing actuator is stuck in the retard position. • Following oil runners are clogged or have leakage. **Oil runners** • Between oil pressure switch and OCV • Between OCV and variable valve timing actuator • In variable valve timing actuator • Loose timing chain or improper valve timing due to timing chain slippage • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Is DTC P2088 or P2089 present?	Yes	Go to the appropriate DTC troubleshooting procedure. (See 01-02B-194 DTC P2088[L3 WITH TC] or 01-02B-196 DTC P2089[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY ENGINE OIL PRESSURE** • Start the engine. • Does the oil pressure warning light illuminate?	Yes	Inspect engine oil pressure. (See 01-11B-3 OIL PRESSURE INSPECTION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY TIMING CHAIN INSTALLATION** • Stop the engine. • Remove the timing chain cover. • Is the camshaft timing mark at the correct point? (See 01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].)	Yes	Go to the next step.
		No	Reinstall the timing chain, then go to Step 8.
6	**INSPECT OCV FOR MALFUNCTION** • Stop the engine. • Remove the OCV. • Inspect the position of the spool valve in the OCV. • Is the spool valve located at the valve retard position?	Yes	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected as an intermittent concern. • The intermittent concern might be removed using the cleaning mode of the variable valve timing control function. Go to the next step.
		No	Replace the OCV, then go to Step 8.

STEP	INSPECTION		ACTION
7	**INSPECT ENGINE OIL RUNNER** • Inspect the following engine oil runners for clogging or leakage. — Between the oil pressure switch and the OCV — Between the OCV and the variable valve timing actuator — In the variable valve timing actuator • Is there any clogging or leakage?	Yes	Repair or replace the suspected runner, then go to the next step.
		No	**VARIABLE VALVE TIMING MECHANISM IS NORMAL** **Note** • This DTC is detected as an intermittent concern. • The intermittent concern might be removed using the cleaning mode of the variable valve timing control function. Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0016[L3 WITH TC]

id010239801800

DTC P0016	CKP-CMP correlation
DETECTION CONDITION	• The PCM monitors the input pulses from the CKP sensor and CMP sensor. If the input pulse pick-up timing do not match each other, the PCM determines that the camshaft position does not coincide with the crankshaft position. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connector • CMP sensor malfunction • CKP sensor malfunction • Damaged or scratched CMP sensor pulse wheel • Damaged or scratched CKP sensor pulse wheel • Foreign material on CMP sensor • Foreign material on CKP sensor • Improper valve timing

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CMP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	**INSPECT CMP SENSOR FOR FOREIGN MATERIAL** • Remove the CMP sensor. • Inspect the CMP sensor for foreign material. • Is there any foreign material on the CMP sensor?	Yes	Remove foreign material from the CMP sensor, then go to Step 13.
		No	Go to the next step.
5	**INSPECT CMP SENSOR PULSE WHEEL** • Visually inspect the CMP sensor pulse wheel. • Is there any damage or scratching to the CMP sensor pulse wheel?	Yes	Replace the camshaft, then go to Step 13. (See01-10B-20 CYLINDER HEAD GASKET REPLACEMENT[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT CMP SENSOR** • Inspect the CMP sensor. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].) • Is the CMP sensor normal?	Yes	Go to the next step.
		No	Replace the CMP, then go to Step 13.
7	**INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the CKP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
8	**INSPECT CKP SENSOR FOR FOREIGN MATERIAL** • Remove the CKP sensor. • Inspect the CKP sensor for foreign material. • Is there any foreign material on the CKP sensor?	Yes	Remove foreign material from the CKP sensor, then go to Step 13.
		No	Go to the next step.
9	**INSPECT CKP SENSOR PULSE WHEEL** • Visually inspect the CKP sensor pulse wheel. • Is there any damage or scratching to the CKP sensor pulse wheel?	Yes	Replace the CKP sensor pulse wheel, then go to Step 13. (See01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**INSPECT CKP SENSOR** • Inspect the CKP sensor. (See01-40B-45 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[L3 WITH TC].) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 13. (See01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
11	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.

STEP	INSPECTION		ACTION
12	**INSPECT VALVE TIMING** • Inspect valve timing. (See01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].) • Is valve timing normal?	Yes	Go to the next step.
		No	Adjust the valve timing properly, then go to the next step. (See01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].)
13	**VERIFY TROUBLESHOOTING OF DTC P0016 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0030[L3 WITH TC]

id010239801900

DTC P0030	Front HO2S heater control circuit problem
DETECTION CONDITION	• OBD system monitors the output signal voltage from oxygen sensor which is in proportion to the element impedance of oxygen sensor. If the output signal voltage is not between **0.75 V** and **1.5 V** after specified time from engine start, heater performance is considered failed. **Monitoring condition** • **74 s** elapsed from engine start • Battery voltage:**10—18 V** **Diagnostic support note** • This is an intermittent monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Open circuit in wiring harness between front HO2S heater terminal 2D and PCM terminal 2C • Short to ground in the wiring harness between front HO2S heater terminal 2D and PCM terminal 2C • Short to power supply in the wiring harness between front HO2S heater terminal 2D and PCM terminal 2C • Open circuit in the wiring harness between front HO2S heater terminal 1B and PCM terminal 2AC • PCM malfunction

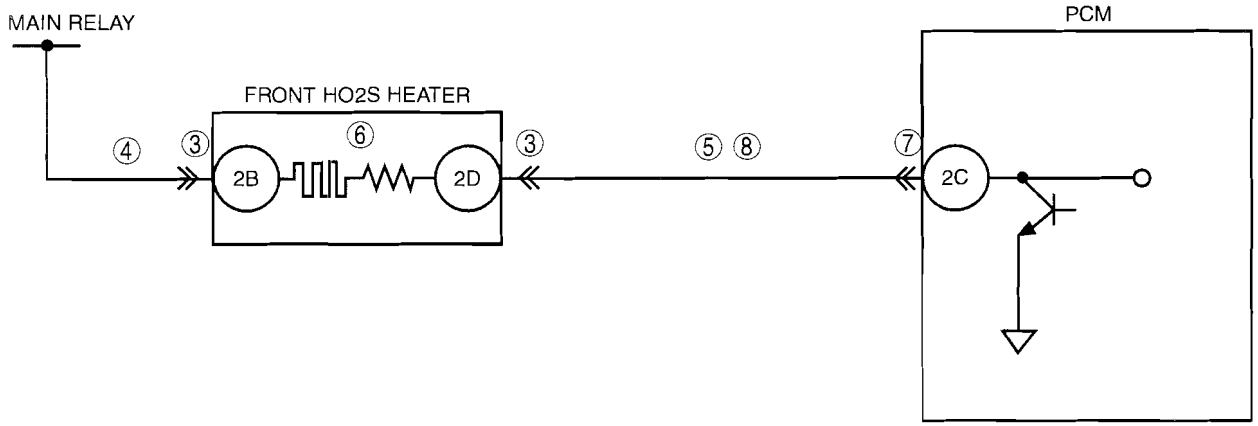
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using the M-MDS. • Is DTC P0031 or P0032 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0030 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 8. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0030 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

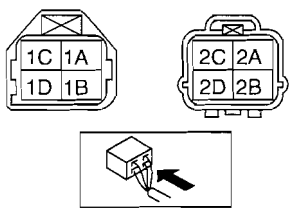
DTC P0031[L3 WITH TC]

id010239802000

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the front HO2S heater output voltage. If the PCM turns the front HO2S heater off or on but the front HO2S heater circuit voltage remains low the PCM determines that the front HO2S heater circuit has a malfunction. **Note** • The front HO2S heater is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between main relay and front HO2S terminal 2B • Short to ground in the wiring harness between main relay and front HO2S terminal 2B • Open circuit in the wiring harness between front HO2S terminal 2D and PCM terminal 2C • Short to ground in the wiring harness between front HO2S terminal 2D and PCM terminal 2C • PCM malfunction

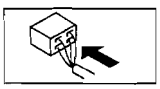


FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

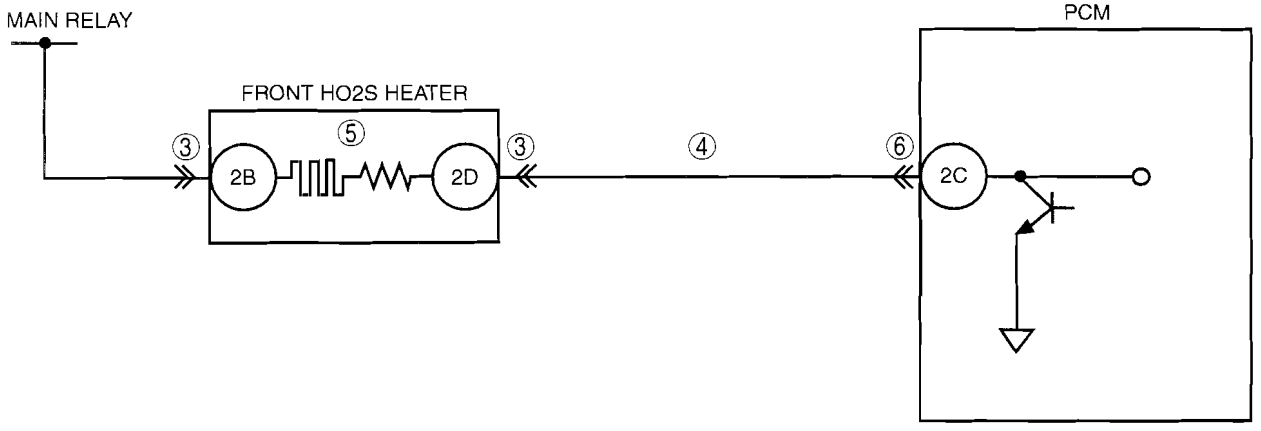
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT FRONT HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal 2B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal 2D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between front HO2S terminal 2D (wiring harness-side) and PCM terminal 2C (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

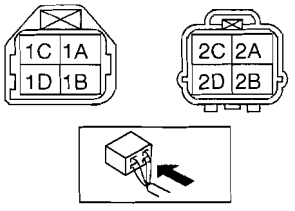
DTC P0032[L3 WITH TC]

id010239802100

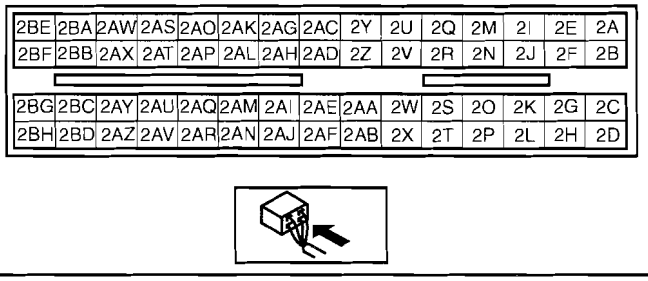
DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the front HO2S heater output voltage. If the PCM turns the front HO2S heater on or off but the front HO2S heater circuit voltage remains high the PCM determines that the front HO2S heater circuit has a malfunction. **Note** • The front HO2S heater is controlled by a duty signal. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in the wiring harness between front HO2S terminal 2D and PCM terminal 2C • PCM malfunction



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR



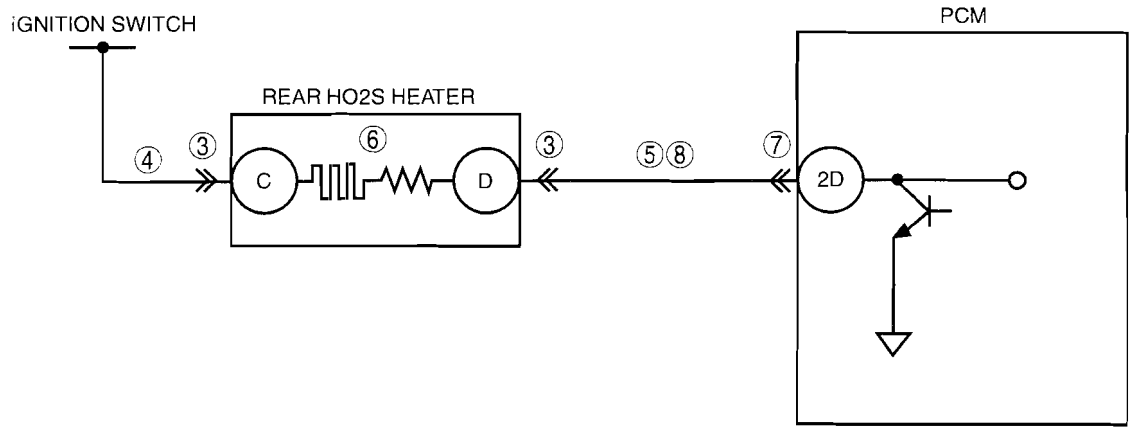
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between front HO2S terminal 2D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT FRONT HO2S HEATER** • Inspect the front HO2S heater. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 7. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

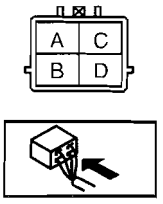
DTC P0037[L3 WITH TC]

id010239802200

DTC P0037	Rear HO2S heater circuit low input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater output voltage. If the PCM turns the rear HO2S heater on or off but the rear HO2S heater circuit voltage remains low the PCM determines that the rear HO2S heater circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between ignition switch and rear HO2S terminal C • Short to ground in the wiring harness between ignition switch and rear HO2S terminal C • Open circuit in the wiring harness between rear HO2S terminal D and PCM terminal 2D • Short to ground in the wiring harness between rear HO2S terminal D and PCM terminal 2D • PCM malfunction



REAR HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

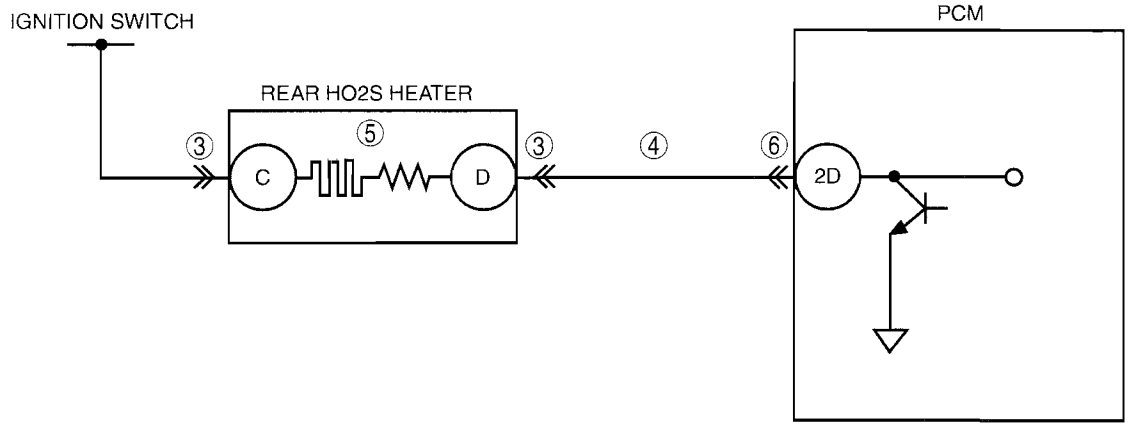
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT OR SHORT TO GROUND** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal C (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 9. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between rear HO2S terminal D (wiring harness-side) and PCM terminal 2D (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

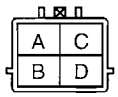
DTC P0038[L3 WITH TC]

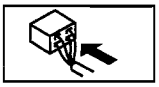
id010239802300

DTC P0038	Rear HO2S heater circuit high input
DETECTION CONDITION	• The PCM monitors the rear HO2S heater output voltage. If the PCM turns the rear HO2S heater off but the rear HO2S heater circuit voltage remains high the PCM determines that the rear HO2S heater circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (HO2S heater). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S heater malfunction • Connector or terminal malfunction • Short to power supply in the wiring harness between rear HO2S terminal D and PCM terminal 2D • PCM malfunction



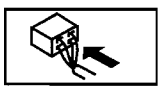
REAR HO2S
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the rear HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between rear HO2S terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	**INSPECT REAR HO2S HEATER** • Inspect the rear HO2S heater. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the rear HO2S, then go to Step 7. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0069[L3 WITH TC]

id010239802400

DTC P0069	Manifold absolute pressure/atmospheric pressure correlation
DETECTION CONDITION	• PCM monitors differences between intake manifold vacuum and atmospheric pressure. If the difference is **below –12 kPa {–90 mmHg, –3.5 inHg}** or **above 12 kPa {90 mmHg, 3.5 inHg}** when the following conditions are met, the PCM determines that there is a MAP sensor performance problem. **MONITORING CONDITION** — **12—15 s** from when ignition switch is turned off. — Intake air temperature is **above -10°C {14°F}.** — Engine coolant temperature is **above 70°C {158°F}.** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • BARO sensor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY STORED DTC** • Turn the ignition switch to off then start the engine. • Have DTC P0107, P0108, P2228 or P2229 been stored?	Yes	Inspect and repair DTC P0107, P0108, P2228 or P2229.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0069 on the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA.
5	**INSPECT MAP SENSOR STUCK OPEN OR CLOSED** • Inspect MAP sensor. (See01-40B-32 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[L3 WITH TC].) • Is the MAP sensor normal?	Yes	Go to the next step.
		No	Replace the MAP sensor, then go to step 7. (See01-40B-31 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
6	**INSPECT BARO SENSOR** • Inspect the BARO sensor. (See01-40B-50 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[L3 WITH TC].) • Is the BARO sensor normal?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
7	**VERIFY TROUBLESHOOTING OF DTC P0069 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0089[L3 WITH TC]

id010239802500

DTC P0089	Fuel pressure regulator performance
DETECTION CONDITION	• If the fuel pressure average value measured by the PCM exceeds the specification when the camshaft is rotating at a specified rate, the PCM determines that there is a fuel pressure regulator performance problem. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Spill valve control solenoid valve malfunction • Connector or terminal malfunction • PCM malfunction

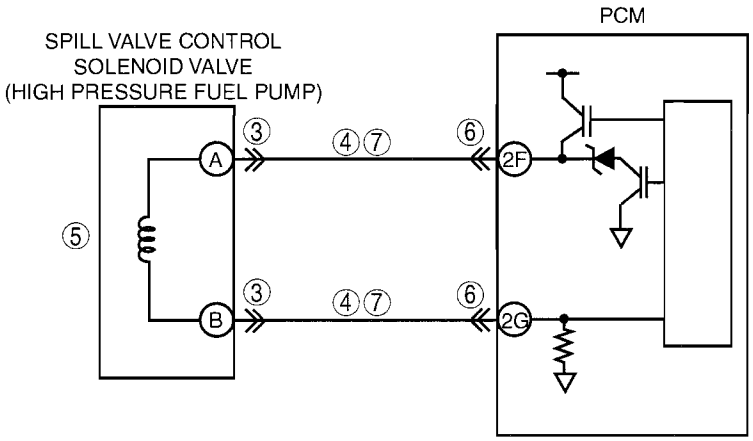
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT HIGH PRESSURE FUEL PUMP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the high pressure fuel pump connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 6.
		No	Go to the next step.
4	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE** • Inspect the spill valve control solenoid valve. (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the high pressure fuel pump, then go to Step 6. (See01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0089 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

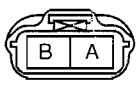
DTC P0091[L3 WITH TC]

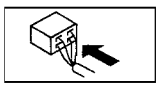
id010239802600

DTC P0091	Fuel pressure regulator control circuit low
DETECTION CONDITION	• When the PCM turns the spill valve control solenoid valve off but the spill valve control solenoid valve control circuit voltage is low, the PCM determines that the spill valve control solenoid valve control circuit has malfunction. **MONITORING CONDITIONS** — The following conditions are met: • Engine speed is **3,000 rpm or less.** • Battery voltage is **10 V or more.** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Spill valve control solenoid valve malfunction • Open circuit in the wiring harness between high pressure fuel pump terminal A and PCM terminal 2F • Open circuit in the wiring harness between high pressure fuel pump terminal B and PCM terminal 2G • Short to ground in the wiring harness between high pressure fuel pump terminal A and PCM terminal 2F • Short to ground in the wiring harness between high pressure fuel pump terminal B and PCM terminal 2G • Connector or terminal malfunction • PCM malfunction



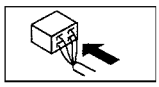
HIGH PRESSURE FUEL PUMP WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

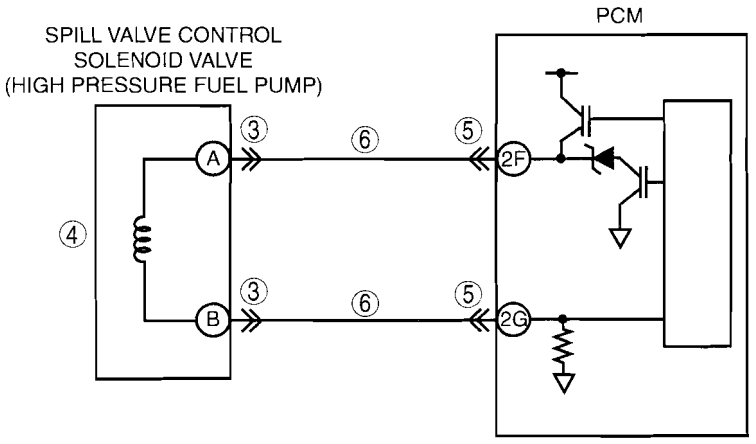
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT HIGH PRESSURE FUEL PUMP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the high pressure fuel pump connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — High pressure fuel pump terminal A (wiring harness-side) and body ground — High pressure fuel pump terminal B (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE** • Inspect the spill valve control solenoid valve. (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) • Is there any malfunction.	Yes	Replace the high pressure fuel pump, then go to Step 8. (See01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — High pressure fuel pump terminal A (wiring harness-side) and PCM terminal 2F (wiring harness-side) — High pressure fuel pump terminal B (wiring harness-side) and PCM terminal 2G (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0091 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

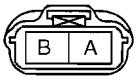
DTC P0092[L3 WITH TC]

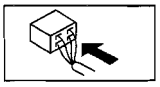
id010239802700

DTC P0092	Fuel pressure regulator control circuit high
DETECTION CONDITION	• When the PCM turns the spill valve control solenoid valve on but the spill valve control solenoid valve circuit voltage is high, the PCM determines that the spill valve control solenoid valve control circuit has malfunction. **MONITORING CONDITIONS** — The following conditions are met: • Engine speed is **3,000 rpm or less**. • Battery voltage is **10 V or more.** **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Spill valve control solenoid valve malfunction • Connector or terminal malfunction • Short to power supply in the wiring harness between high pressure fuel pump terminal B and PCM terminal 2G • PCM malfunction

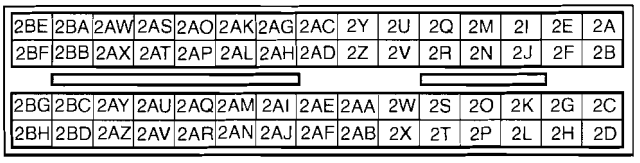


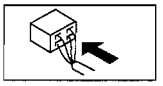
HIGH PRESSURE FUEL PUMP WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR





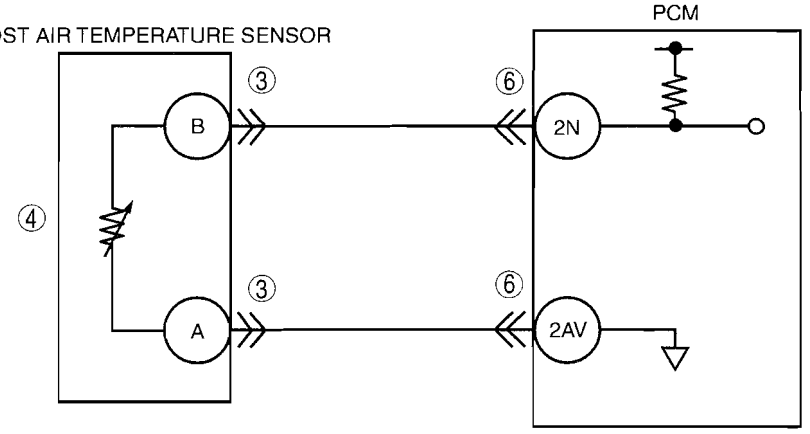
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT HIGH PRESSURE FUEL PUMP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the high pressure fuel pump connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE** • Inspect the spill valve control solenoid valve. (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) • Is there any malfunction.	Yes	Replace the high pressure fuel pump, then go to Step 7. (See01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals: — High pressure fuel pump terminal A (wiring harness-side) and body ground — High pressure fuel pump terminal B (wiring harness-side) and body ground • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to the power supply, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0092 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

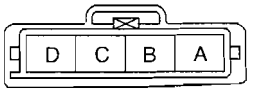
DTC P0096[L3 WITH TC]

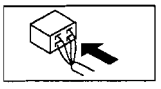
id010239802800

DTC P0096	Boost air temperature sensor circuit range/performance problem
DETECTION CONDITION	• If the boost air temperature is higher than the engine coolant temperature by **23 °C {41.4 °F}** for **1.2 s** with the ignition switch turn to the ON position*, the PCM determines that there is a boost air temperature sensor circuit range/performance problem. *: Ignition switch on when **6 h or more** has passed since the ignition switch was turned off **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Boost air temperature sensor malfunction • ECT sensor malfunction • Connector or terminal malfunction • PCM malfunction



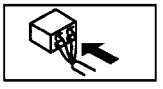
MAP/BOOST AIR TEMPERATURE SENSOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



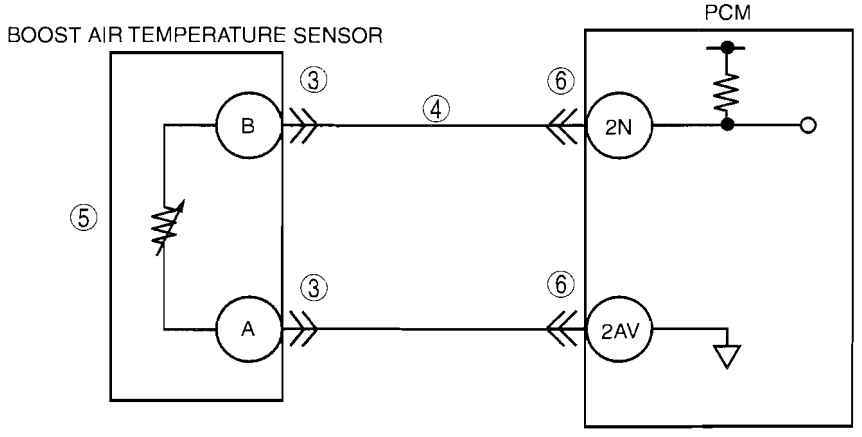
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MAP/BOOST AIR TEMPERATURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAP/boost air temperature sensor connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT BOOST AIR TEMPERATURE SENSOR** • Inspect the boost air temperature sensor. (See01-40B-33 BOOST AIR TEMPERATURE SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the MAP/boost air temperature sensor, then go to Step 7. (See01-40B-31 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT ECT SENSOR** • Inspect the ECT sensor. (See01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the ECT sensor, then go to Step 7. (See01-40B-27 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0096 COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and run it under the FREEZE FRAME DATA condition. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

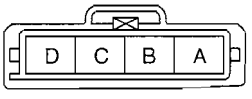
DTC P0097[L3 WITH TC]

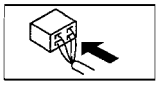
id010239802900

DTC P0097	Boost air temperature sensor circuit low
DETECTION CONDITION	• If the PCM detects that the boost air temperature sensor voltage is **0.1 V or less**, the PCM determines that the boost air temperature sensor circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Boost air temperature sensor malfunction • Short to ground circuit between MAP/boost air temperature sensor terminal B and PCM terminal 2N • Connector or terminal malfunction • PCM malfunction



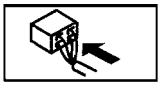
MAP/BOOST AIR TEMPERATURE SENSOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



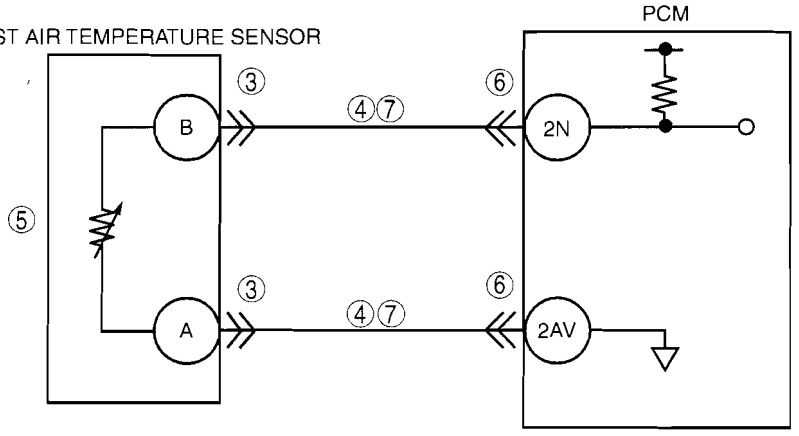
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MAP/BOOST AIR TEMPERATURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAP/boost air temperature sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT BOOST AIR TEMPERATURE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the MAP/boost air temperature sensor terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 7.
		No	Go to the next step.
5	**INSPECT BOOST AIR TEMPERATURE SENSOR** • Inspect the boost air temperature sensor. (See01-40B-33 BOOST AIR TEMPERATURE SENSOR INSPECTION[L3 WITH TC].) • Is there malfunction?	Yes	Replace the MAP/boost air temperature sensor, then go to Step 7. (See01-40B-31 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0097 COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

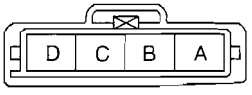
DTC P0098[L3 WITH TC]

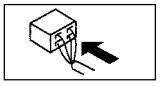
id010239803000

DTC P0098	Boost air temperature sensor circuit high
DETECTION CONDITION	• If the PCM detects that the boost air temperature sensor voltage is **4.96 V or more**, the PCM determines that the boost air temperature sensor circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Boost air temperature sensor malfunction • Open circuit between MAP/boost air temperature sensor terminal A and PCM terminal 2AV • Open circuit between MAP/boost air temperature sensor terminal B and PCM terminal 2N • Short to the power circuit between MAP/boost air temperature sensor terminal A and PCM terminal 2AV • Short to the power circuit between MAP/boost air temperature sensor terminal B and PCM terminal 2N • Connector or terminal malfunction • PCM malfunction



MAP/BOOST AIR TEMPERATURE SENSOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT MAP/BOOST AIR TEMPERATURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAP/boost air temperature sensor connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT MAP/BOOST AIR TEMPERATURE SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals: — MAP/boost air temperature sensor terminal B (wiring harness-side) and body ground — MAP/boost air temperature sensor terminal A (wiring harness-side) and body ground • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT BOOST AIR TEMPERATURE SENSOR** • Inspect the boost air temperature sensor connector. (See01-40B-33 BOOST AIR TEMPERATURE SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the MAP/boost air temperature sensor, then go to Step 8. (See01-40B-31 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT MAP/BOOST AIR TEMPERATURE SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Measure the voltage between the following terminals: — MAP/boost air temperature sensor terminal B (wiring harness-side) and PCM terminal 2N (wiring harness-side) — MAP/boost air temperature sensor terminal A (wiring harness-side) and PCM terminal 2AV (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0098 COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0101[L3 WITH TC]

id010239803100

DTC P0101	MAF circuit range/performance problem
DETECTION CONDITION	• PCM monitors the mass intake air flow amount when the engine is running. — If the mass intake air amount is **above 71.8 l/s** for **6 s** and engine speed is **below 2,000 rpm** with the engine running, the PCM determines that detected mass intake air flow amount is too high. — If the mass intake air flow amount is **below 3.0—88.7 l/s** (The value depends on engine speed.) for **6 s** and the engine speed is **above 1,000 rpm** with engine running and the throttle opening angle is **above 50%**, the PCM determines that the detected mass intake air flow amount is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Electrical corrosion in MAF RETURN circuit • Voltage drops in the ground circuit

Diagnostic procedure

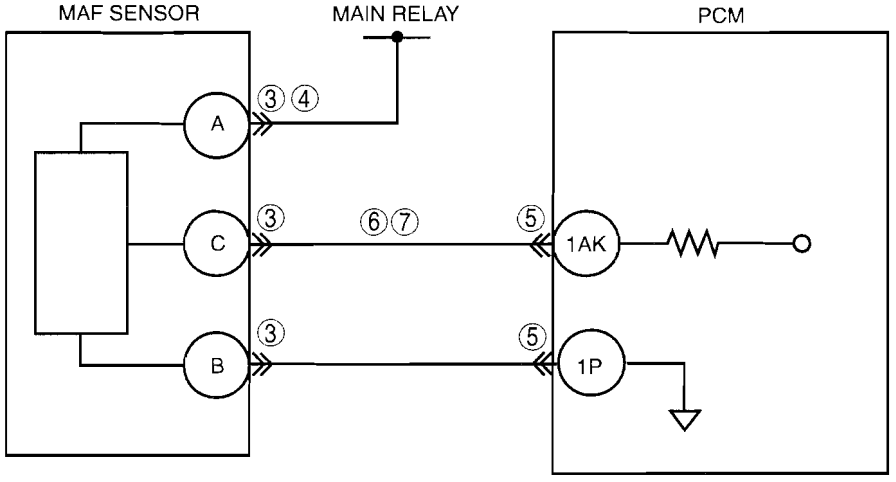
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Connect the M-MDS to DLC-2. • Start the engine. • Access the ECT, MAF, TP and RPM PIDs using the M-MDS. • Warm-up the engine until the ECT PID is **above 70°C {158°F}.** • Idle engine for**5 s or more.** **Caution** • **While driving, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID: **50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — gear in • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC])
4	**CHECK MAF SENSOR TERMINALS FOR ELECTRICAL CORROSION** • Turn the ignition switch off. • Disconnect the MAF sensor connector. • Check for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is any problem corrosion found?	Yes	Repair or the replace suspected terminal or MAF sensor, then go to Step 6.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Check for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED** • Make sure to connect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Warm-up engine until ECT PID is **above 70°C {158°F}.** • Idle engine for **5 s or more.** **Caution** • **While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.** • Drive the vehicle under the following two conditions: **Condition 1** — TP PID:**50—87.5%** — RPM PID: **above 1,000 rpm** — 4th gear **Condition 2** — TP PID: **above 80%** — RPM PID: **below 2,000 rpm** — gear in • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC]) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC])
		No	Troubleshooting completed.

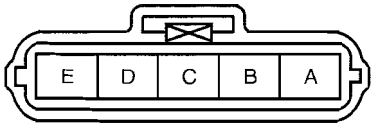
DTC P0102[L3 WITH TC]

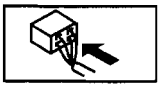
id010239803200

DTC P0102	MAF circuit low input
DETECTION CONDITION	• PCM monitors input voltage from the MAF sensor when engine is running. If the input voltage is **below 0.21 V**, the PCM determines that the MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to ground in the wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK • Open circuit in the wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK • Open circuit in the wiring harness between main relay and MAF/IAT sensor terminal A



MAF/IAT SENSOR
HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

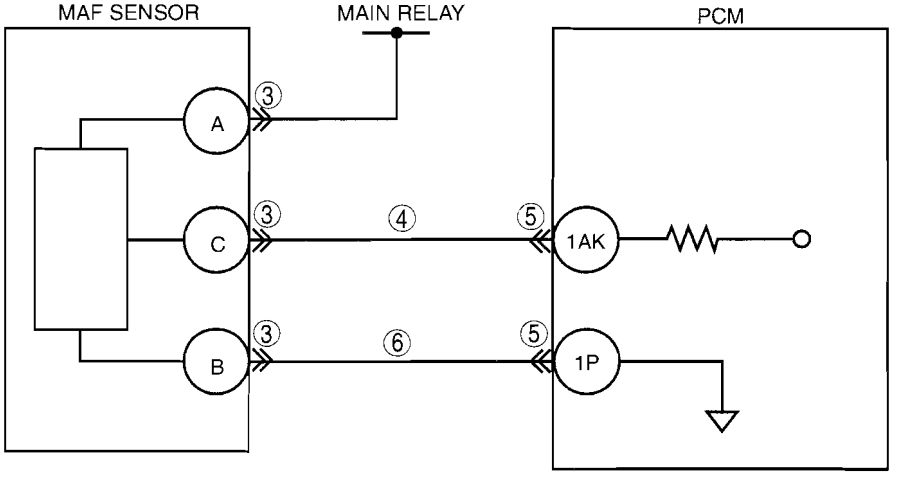
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 8.
		No	Go to the next step.
4	**INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Inspect voltage at MAF/IAT sensor terminal A (harness-side). • Is voltage **B+**?	Yes	Go to the next step.
		No	Inspect for an open circuit in the wiring harness between MAF/IAT sensor terminal A (harness-side) and the main relay. Repair or replace the wiring harness, then go to Step 8.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Remove the PCM with the PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal C (harness-side) and PCM terminal 1AK (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or the replace suspected wiring harness, then go to Step 8.
7	**INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT CIRCUIT** • Inspect for continuity between the MAF/IAT sensor terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to the next step.
		No	Replace the MAF/IAT sensor, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

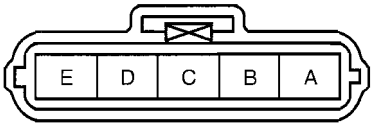
DTC P0103[L3 WITH TC]

id010239803300

DTC P0103	MAF circuit high input
DETECTION CONDITION	• The PCM monitors input voltage from the MAF sensor when the engine is running. If the input voltage is **above 4.9 V**, the PCM determines that the MAF circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAF sensor malfunction • Connector or terminal malfunction • Short to power supply in the wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK • Open circuit in the wiring harness between MAF/IAT sensor terminal B and PCM terminal 1P

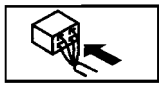


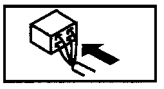
MAF/IAT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D





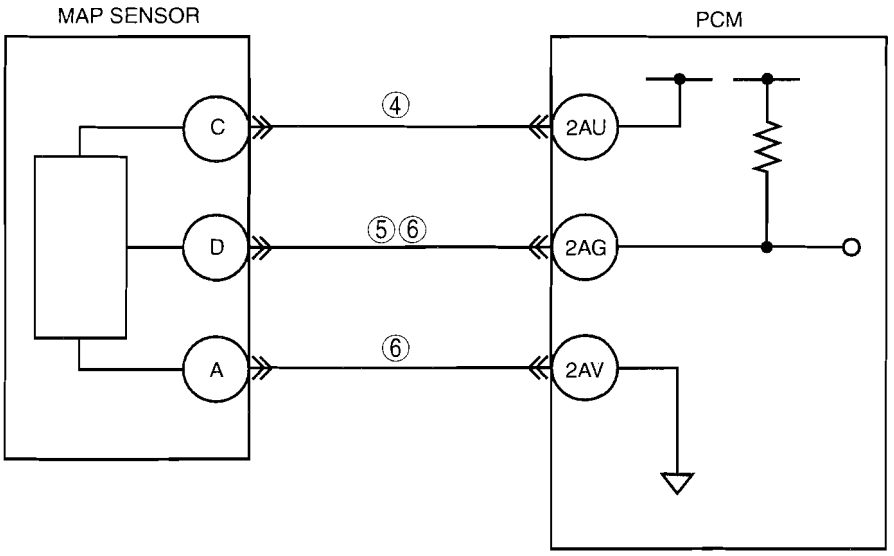
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MAF SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to the next step.
4	**INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch to the ON position (Engine off). • Measure voltage between MAF/IAT sensor terminal C (harness-side) and body ground. • Is voltage **0 V?**	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Remove the PCM with the PCM connector connected. • Inspect for continuity between MAF/IAT sensor terminal B (harness-side) and PCM terminal 1P. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

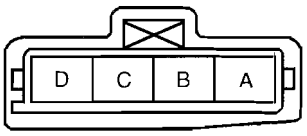
DTC P0107[L3 WITH TC]

id010239803400

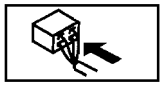
DTC P0107	MAP sensor circuit low input
DETECTION CONDITION	• PCM monitors input voltage from the MAP sensor when the intake air temperature is **above –10 °C {14 °F}**. If the input voltage is **below 0.10 V**, the PCM determines that the MAP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Short to ground in the wiring harness between MAP sensor terminal D and PCM terminal 2AG • Open circuit in the wiring harness between MAP sensor terminal C and PCM terminal 2AU • MAP sensor signal circuit and MAP sensor ground circuit are shorted to each other. • PCM malfunction

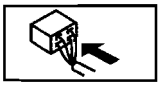


MAP SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR





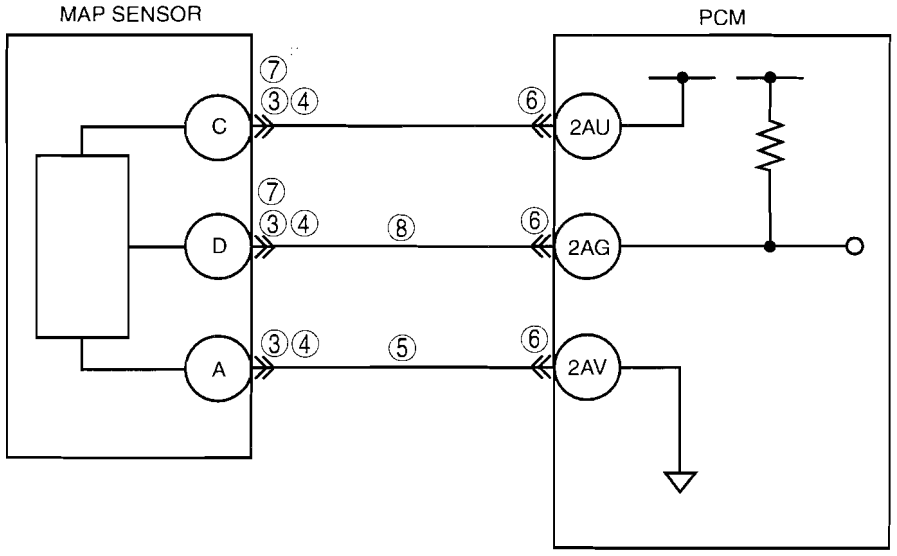
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Recorded FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY MAP PID WHEN MAP SENSOR CONNECTOR IS DISCONNECTED** • Disconnect the MAP sensor connector. • Is the voltage **above 4.9 V?**	Yes	Go to the next step.
		No	Go to step 5.
4	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT MAP SENSOR CONNECTOR** **Note** • If DTC P0122 and P2228 are also retrieved with P0107, go to the CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition switch to the ON position (Engine off). • Measure voltage between MAP sensor terminal C (harness-side) and body ground. • Is the voltage **within 4.5—5.5 V?**	Yes	Check for a poor connection of MAP sensor terminal C (harness-side). • Repair or replace the terminal if necessary. • If normal, replace the MAP sensor. Then go to Step 7.
		No	Check for an open circuit between PCM terminal 2K (harness-side) and MAP sensor terminal C (harness-side). Repair or replace the suspected wiring harness, then go to Step 7.
5	**INSPECT MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for continuity between MAP sensor terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MAP SENSOR SIGNAL AND GROUND CIRCUIT FOR SHORT EACH OTHER** • Check for continuity between MAP sensor terminals D and A (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

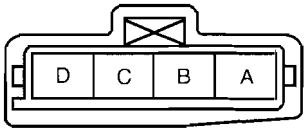
DTC P0108[L3 WITH TC]

id010239803500

DTC P0108	MAP sensor circuit high input
DETECTION CONDITION	• PCM monitors input voltage from the MAP sensor when the intake air temperature is **above –10 °C {14 °F}**. If the input voltage is **above 4.92 V**, the PCM determines that MAP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• MAP sensor malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between MAP sensor terminal A and PCM terminal 2AV • Open circuit in the wiring harness between MAP sensor terminal D and PCM terminal 2AG • MAP sensor signal circuit short to the constant voltage supply circuit • PCM malfunction

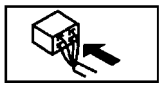


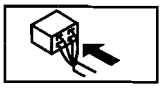
MAP SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT CONNECTION OF MAP SENSOR CONNECTOR** • Turn the ignition switch off. • Verify that the MAP sensor connector is connected securely. • Is the connection normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 9.
4	**INSPECT MAP SENSOR CONNECTOR FOR POOR CONNECTION** • Disconnect the MAP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the suspected terminal, then go to Step 9.
		No	Go to the next step.
5	**VERIFY MAP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAP sensor terminal A (harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Inspect for an open circuit between PCM terminal 2AV (harness-side) and MAP sensor terminal A (harness-side). Repair or replace the suspected wiring harness, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to the next step.
7	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect for continuity between MAP sensor terminal D and C (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 9.
		No	Go to the next step.
8	**VERIFY MAP SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAP sensor terminal D (harness-side) and PCM terminal 2AG (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to applicable inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0111[L3 WITH TC]

id010239803600

DTC P0111	IAT circuit performance problem
DETECTION CONDITION	• If the intake air temperature is higher than the engine coolant temperature by **18 °C {32.4 °F}** for **1.2 s** with the ignition switch turn in the ON position*, the PCM determines that there is an IAT sensor circuit range/performance problem. *: Ignition switch is in the ON position when **6 h or more** have passed since the ignition switch was turned off **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at MAF/IAT sensor or PCM connector • PCM malfunction

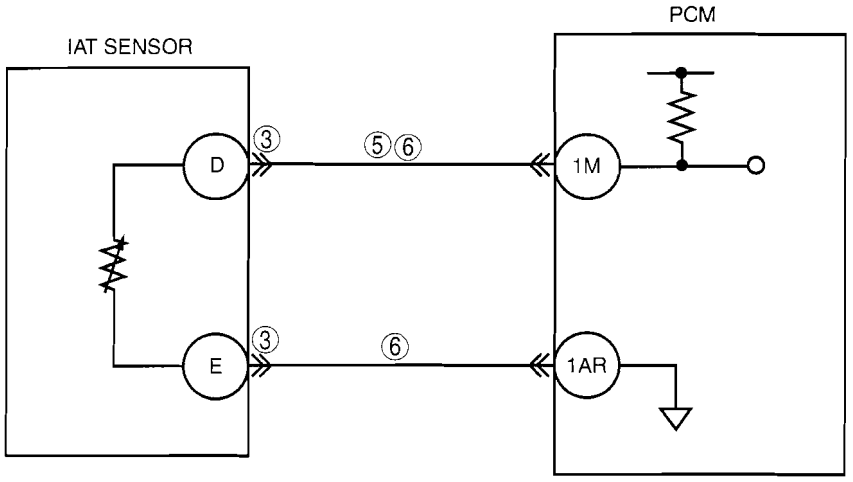
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT IAT SENSOR** • Inspect IAT sensor. (See01-40B-30 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[L3 WITH TC].) • Is IAT sensor normal?	Yes	Replace MAF/IAT sensor, then go to Step 6.
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and run the engine under the FREEZE FRAME DATA condition. • Is PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

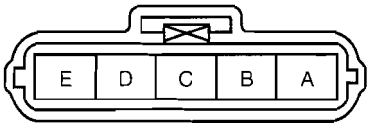
DTC P0112[L3 WITH TC]

id010239803700

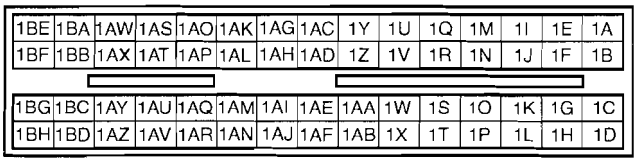
DTC P0112	IAT circuit low input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal. If the PCM detects on IAT sensor voltage is **below 0.06 V**, the PCM determines that the IAT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Poor connection at the MAF/IAT sensor or PCM connector • Short to ground between MAF/IAT sensor terminal D and PCM terminal 1M • Short to each harness IAT signal circuit and IAT ground circuit. • PCM malfunction

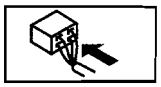


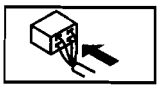
MAF/IAT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT IAT SENSOR TERMINAL** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for bent terminal of MAF/IAT sensor terminals D and E (part-side). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.

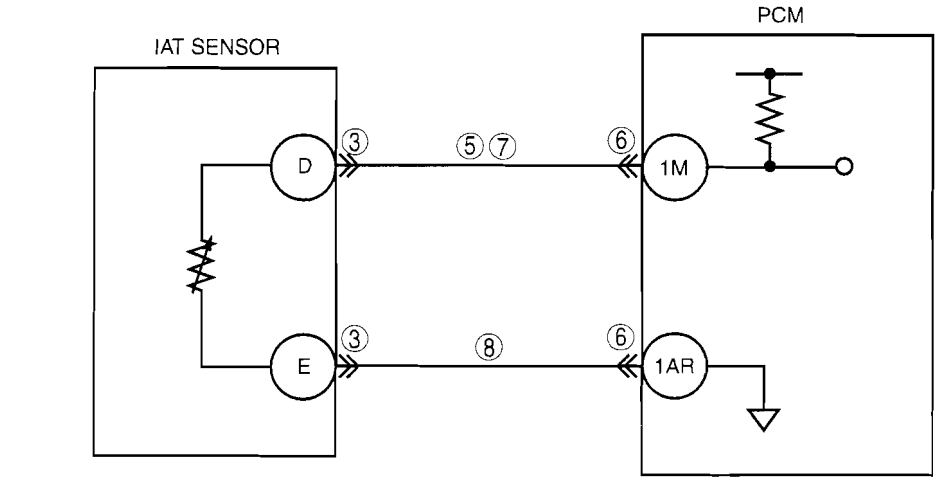
STEP	INSPECTION		ACTION
4	**CLASSIFY IAT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to DLC-2. • Access the IAT PID. • Verify the IAT value when disconnecting the MAF/IAT sensor connector. • Does the IAT value change?	Yes	Replace the MAF/IAT sensor, then go to Step 7.
		No	Go to the next step.
5	**INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for continuity between MAF/IAT sensor terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 7.
		No	Go to the next step.
6	**INSPECT IAT CIRCUITS FOR SHORT** • Inspect for continuity between MAF/IAT sensor terminals D and E (harness-side). • Is there continuity?	Yes	Repair or the replace harness for a short, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0113[L3 WITH TC]

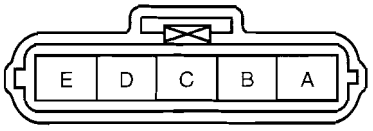
id010239803800

DTC P0113	IAT circuit high input
DETECTION CONDITION	• The PCM monitors the IAT sensor signal. If the PCM detected IAT sensor voltage is **above 4.9 V**, the PCM determines that the IAT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• IAT sensor malfunction • Open circuit between MAF/IAT sensor terminal D and PCM terminal 1M • Short to the power supply between MAF/IAT sensor terminal D and PCM terminal 1M • Open circuit between MAF/IAT sensor terminal E and PCM terminal 1AR • Poor connection at the MAF/IAT sensor or the PCM connector. • PCM malfunction

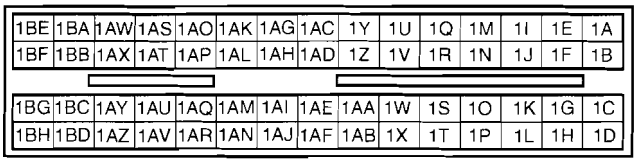
DTC P0113	IAT circuit high input

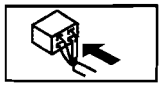


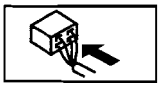
MAF/IAT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION** • Connect the M-MDS to the DLC-2. • Access the IAT PID. • Connect a jumper wire between MAF/IAT sensor terminals D and E (harness-side). • Verify the IAT value. • Is the voltage **below 4.9 V?**	Yes	Replace the MAF/IAT sensor, then go to Step 9.
		No	Go to the next step.

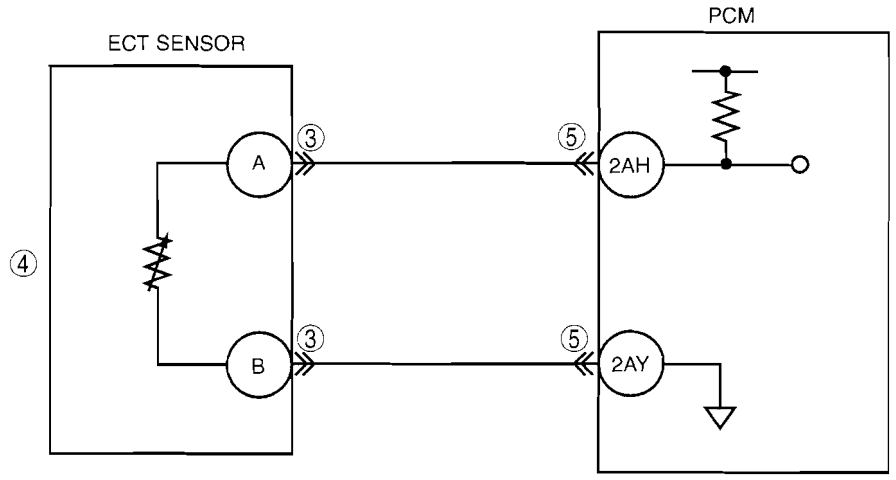
STEP	INSPECTION		ACTION
5	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between MAF/IAT sensor terminal D (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or the wiring replace wiring harness for a short to the power supply, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect PCM connector. • Inspect PCM terminals 1M and 1AR (harness-side) for tightness using a feeler tool. • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAF/IAT sensor terminal D (harness-side) and PCM terminal 1M (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
8	**INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between MAF/IAT sensor terminal E (harness-side) and PCM terminal 1AR (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wi ring harness for an open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0116[L3 WITH TC]

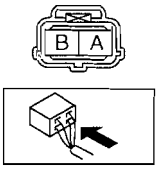
id010239803900

DTC P0116	ECT circuit range/performance problem
DETECTION CONDITION	• The PCM monitors the maximum value and minimum value of engine coolant temperature when the engine is started and**5 min** have been passed after leaving the vehicle **6 h or more**. If the difference between the maximum and the minimum values of the engine coolant temperature is **below 6 °C {10.8 °F}**, the PCM determines that there is an ECT circuit range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connector or terminal malfunction • PCM malfunction

DTC P0116	ECT circuit range/performance problem

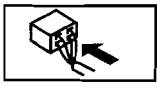


ECT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

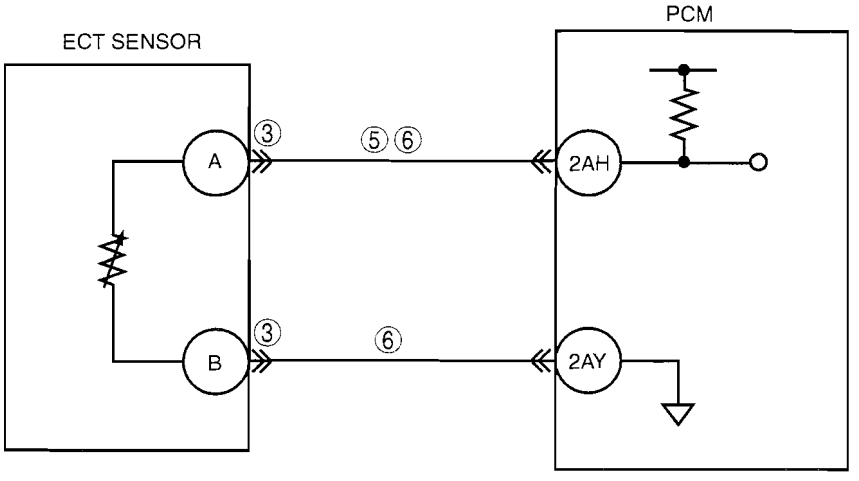
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to ne, then go next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT ECT SENSOR** • Inspect the ECT sensor. (See01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the ECT sensor, then go to Step 6. (See01-40B-27 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY TROUBLESHOOTING OF DTC P0116 COMPLETED** • Leave vehicle for **8 h.** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and wait for **5 min.** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC]) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC])
		No	DTC troubleshooting completed.

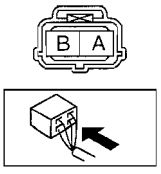
DTC P0117[L3 WITH TC]

id010239804000

DTC P0117	ECT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects the ECT sensor voltage is **below 0.2 V**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connect or terminal malfunction • Short to ground in the wiring harness between ECT sensor terminal A and PCM connector terminal 2AH • Short to each wiring harness in ECT signal circuit and ECT ground circuit • PCM malfunction

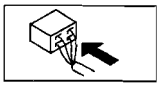


ECT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



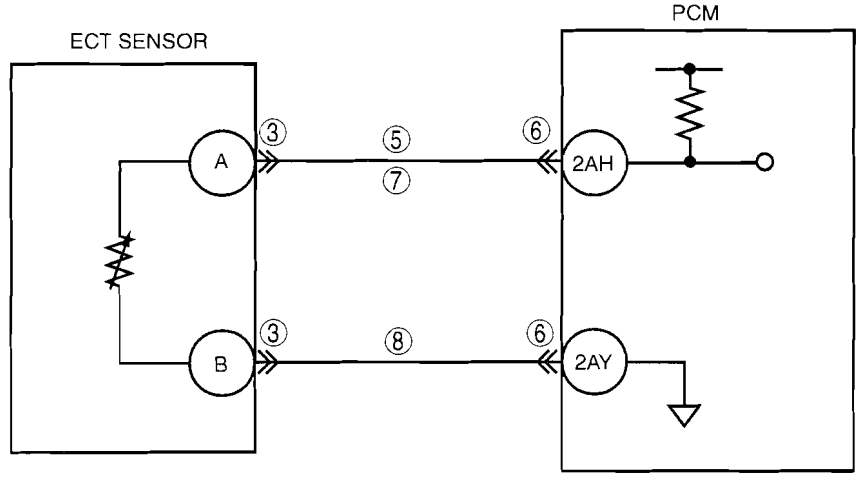
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (damaged, pulled-out pins, corrosion, bending, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to DLC-2. • Access the ECT PID. • Verify the ECT value when disconnecting the ECT sensor connector. • Does the ECT value change?	Yes	Replace the ECT sensor, then go to Step 7. (See01-40B-27 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 7.
		No	Go to the next step.
6	**INSPECT ECT CIRCUIT FOR SHORT TO WIRING HARNESSES** • Inspect for continuity between ECT sensor terminal A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for a short, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

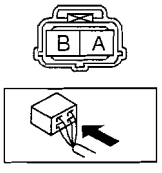
DTC P0118[L3 WITH TC]

id010239804100

DTC P0118	ECT sensor circuit high input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects the ECT sensor voltage is **above 4.58 V**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Connect or terminal malfunction • Open circuit in the wiring harness between ECT sensor terminal A and PCM terminal 2AH • Short to power supply in the wiring harness between ECT sensor terminal A and PCM terminal 2AH • Open circuit in the wiring harness between ECT sensor terminal B and PCM terminal 2AY • PCM malfunction

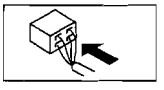


ECT SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

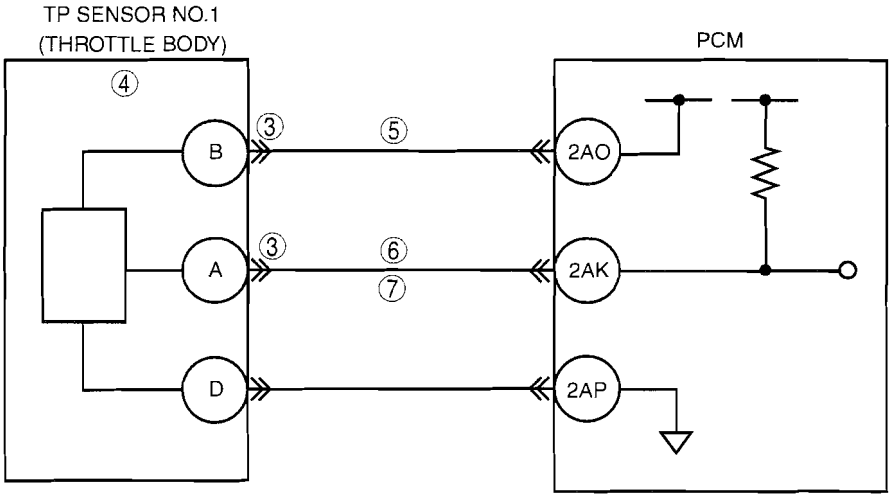
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect ECT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • Connect the M-MDS to the DLC-2. • Access the ECT PID. • Connect a jumper wire between ECT sensor terminals A and B. • Verify the ECT value. • Is the voltage **4.58 V or below**?	Yes	Replace the ECT sensor, then go to Step 9.
		No	Go to the next step.
5	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between ECT sensor terminal A (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a short to power supply, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect the continuity between ECT sensor terminal A (wiring harness-side) and PCM terminal 2AH. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
8	**INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between ECT sensor terminal B (wiring harness-side) and PCM terminal 2AY. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

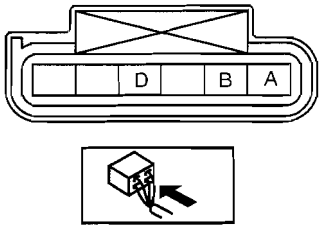
DTC P0122[L3 WITH TC]

id010239804200

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	• If the PCM detects that the TP sensor No.1 voltage is **below 0.2 V** after the ignition switch is turned to the ON position, the PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Short to ground between throttle body terminal A and PCM terminal 2AK • Short to ground between throttle body terminal B and PCM terminal 2AO • PCM malfunction



THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

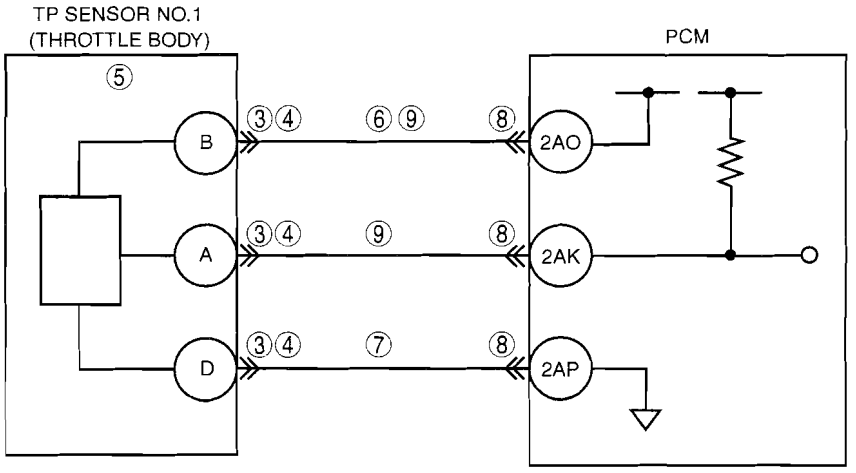
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY TP SENSOR OR HARNESS MALFUNCTION** • Connect the M-MDS. • Access the TP1 PID. • Disconnect the throttle body connector. • Connect a jumper wire between throttle body terminals A and B (harness-side). • Is the voltage **above 4.9 V?**	Yes	Go to the next step.
		No	Go to step 5.
4	**INSPECT TP SENSOR** • Perform the TP sensor inspection. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) • Is the TP sensor normal?	Yes	Inspect for poor throttle body connector terminal B connection. Repair or replace if necessary, then go to Step 8.
		No	Replace throttle body, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR** **Note** • If DTC P0107 and P2228 are also retrieved with P0122, go to CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition switch to the ON position (Engine off). • Measure the voltage at throttle body terminal B (harness-side). • Is the voltage **within 4.5—5.5 V?**	Yes	Go to the next step.
		No	Repair or replace for an open circuit between throttle body connector terminal B (harness-side) and PCM connector terminal 2AO (harness-side). Then, then go to Step 8.
6	**VERIFY TP1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal A (harness-side) and PCM terminal 2AK (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the suspected harness, then go to Step 8.
7	**VERIFY TP1 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between throttle body terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

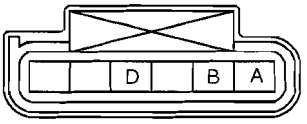
DTC P0123[L3 WITH TC]

id010239804300

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	• If the PCM detects that the TP sensor No.1 voltage is **above 4.85 V** after ignition switch to the ON position, PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal B and PCM terminal 2AO • Open circuit between throttle body terminal D and PCM terminal 2AP • Short to the constant voltage supply circuit between throttle body terminal A and PCM terminal 2AK • PCM malfunction

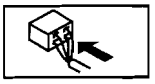


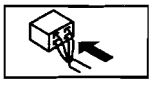
THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE BODY CONNECTOR** • Turn the ignition switch off. • Verify that the throttle body connector is connected securely. • Is connector normal?	Yes	Go to the next step.
		No	Connect the connector securely, then go to Step 10.
4	**INSPECT THROTTLE BODY CONNECTION FOR POOR CONNECTION** • Disconnect throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the suspected wiring terminal, then go to Step 10.
		No	Go to the next step.
5	**INSPECT TP SENSOR** • Perform the TP sensor inspection. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC]) • Is the TP sensor normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 10.
6	**INSPECT TP1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal B (harness-side) and body ground. • Is the voltage **above 4.9 V?**	Yes	Go to the next step.
		No	Repair or replace for short to a power supply. Then, go to Step 10.
7	**VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between throttle body connector terminal D (harness-side) and PCM connector terminal 2AP. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace for an open circuit between TP sensor connector terminal B (harness-side) and PCM connector terminal 3P (harness-side). Then, go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to Step 10.
9	**VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT** • Inspect for continuity between throttle body terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to the next step.
		No	Go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0125[L3 WITH TC]

id010239804400

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	• The PCM monitors the ECT sensor signal after the engine is started while the engine is cold. If the engine coolant temperature does not reach the expected temperature for a specified period, the PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control. **Diagnostic support note** • This is a continuous monitor (Engine cooling system). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • Cooling system malfunction • Poor connection of connectors • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT** • Start the engine. • Warm up the engine completely. • Access the ECT PID using the M-MDS. • Is the ECT PID **above 60 °C {140 °F}?**	Yes	Intermittent concern exists. Go to the INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	**INSPECT ECT SENSOR** • Inspect the ECT sensor. (See01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ECT sensor, then go to Step 7.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off). • Access the ECT PID using the M-MDS. • Wait until ECT PID **below 8 °C {46 °F}.** • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0126, P0128[L3 WITH TC]

id010239815400

DTC P0126 DTC P0128	**Coolant thermostat stuck open**
DETECTION CONDITION	**DTC P0126** • If the ECT signal never exceeds **71 °C {160 °F}** after engine start for specified period, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — IAT: **above –10 °C {14 °F}** — Vehicle speed: **over 6 km/h {3.7 mph}** **DTC P0128** • PCM monitors MAF, IAT, VSS and EAT signals and calculate radiator heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, PCM determines that the coolant thermostat is stuck open. **MONITORING CONDITIONS** — ECT at engine start: **below 36 °C {97 °F}** — IAT: **above –10 °C {14 °F}** — Difference between ECT at engine start and minimum IAT: **below 6 °C {10.8 °F}** — Vehicle speed: **over 30 km/h {18.6 mph}** **Diagnostic support note** • This is an intermittent monitor (Engine cooling system). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first the drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in PCM memory. • DIAGNOSTIC MONITORING TEST RESULTS is available.
POSSIBLE CAUSE	• ECT sensor malfunction • Cooling system malfunction • Coolant thermostat malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to the next step.
4	**INSPECT COOLANT THERMOSTAT FOR WHETHER STUCK OPEN** • Perform coolant thermostat inspection. • Is coolant thermostat normal?	Yes	Inspect ECT sensor. Replace ECT sensor if necessary, then go to the next step.
		No	Replace coolant thermostat, then go to the next step.
5	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down engine. **Note** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Turn ignition switch to ON (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Access ECT, IAT PIDs and make sure that each value is within following specifications. — ECT: **below 36 °C {97 °F}** (for P0128 only) — IAT: **above –10°C {14°F}** — Difference between ECT and IAT: **below 6°C {43°F}** • Is there any PID that is out of specification?	Yes	Take corrective action (e.g. cool down engine), then repeat this step.
		No	Go to the next step for DTC P0126 or go to step 7 for DTC P0128.
6	**VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using the M-MDS and monitor TEST #10: E1: 81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops during every**5 minutes** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **–10°C {14°F}**, monitoring period is**38 minutes** and ECT is **30 °C {86 °F}**, monitoring period is **8 minutes**) • Verify TEST #10: E1: 81 (ECT) value. • Is value above minimum value?	Yes	Go to Step 8.
		No	Replace PCM, then go to Step 8.

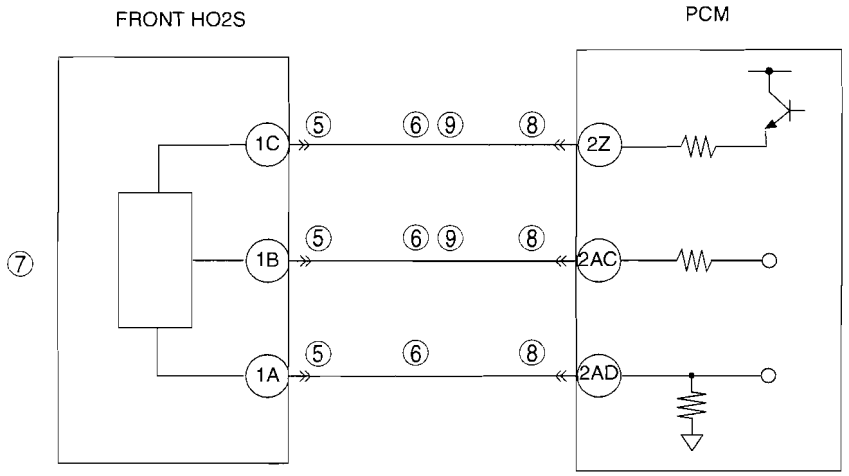
STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED** • Start engine and turn off E/L and A/C. • Access DIAGNOSTIC MONITORING TEST RESULTS using the M-MDS and monitor TEST #10: E1: 80 (Heat radiation ratio) or #10: E1: 81 (ECT). **Note** • This test requires actual driving. Chassis roller cannot be used for this test. • During test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify TEST #10: E1: 80 (Heat radiation ratio) and #10: EI: 81 (ECT) value. • Are value of TEST #10: E1: 80 (Heat radiation ratio) below maximum value and value of TEST #10: E1: 81 (ECT) above minimum value?	Yes	Go to the next step.
		No	Replace PCM, then go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". • Is any DTC present?	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0131[L3 WITH TC]

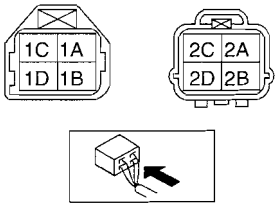
id010239804600

DTC P0131	Front HO2S circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S when the engine is running. If the input voltage is **above 1.0 V** for **2 s**, the PCM determines that the front HO2S circuit voltage is low. **Diagnostic support note** • This is a continuance monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.

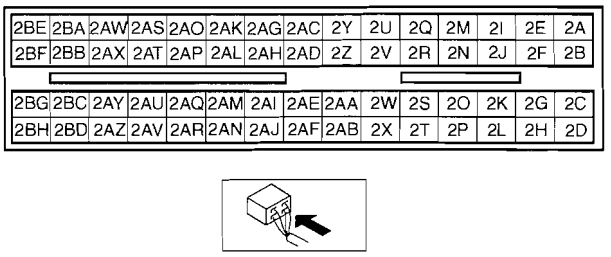
DTC P0131	Front HO2S circuit low input
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between front HO2S terminal 1C and PCM terminal 2Z • Short to ground in the wiring harness between front HO2S terminal 1C and PCM terminal 2Z • Open circuit in the wiring harness between front HO2S terminal 1B and PCM terminal 2AC • Short to ground in the wiring harness between front HO2S terminal 1B and PCM terminal 2AC • Short to ground in the wiring harness between front HO2S terminal 1A and PCM terminal 2AD • PCM malfunction



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

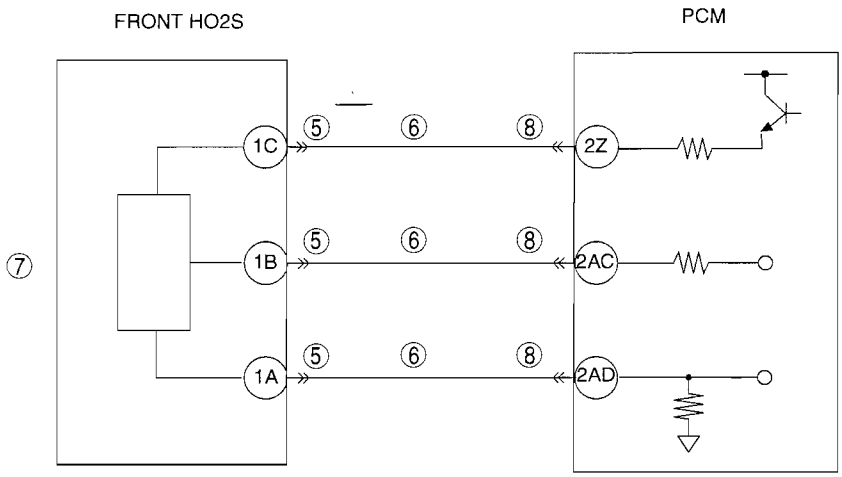
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0131 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)

STEP	INSPECTION		ACTION
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — Front HO2S terminal 1A (wiring harness-side) and body ground — Front HO2S terminal 1B (wiring harness-side) and body ground — Front HO2S terminal 1C (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 10. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — Front HO2S terminal 1B (wiring harness-side) and PCM terminal 2AC (wiring harness-side) — Front HO2S terminal 1C (wiring harness-side) and PCM terminal 2Z (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

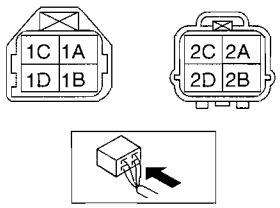
DTC P0132[L3 WITH TC]

id010239804700

DTC P0132	Front HO2S circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the front HO2S when the engine is running. If the input voltage is **less than 1.0 V** for **2 s**, the PCM determines that the front HO2S circuit voltage is high. **Diagnostic support note** • This is a continuance monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to the power supply in the wiring harness between front HO2S terminal 1C and PCM terminal 2Z • Short to the power supply in the wiring harness between front HO2S terminal 1B and PCM terminal 2AC • Short to the power supply in the wiring harness between front HO2S terminal 1A and PCM terminal 2AD • PCM malfunction



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0132 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
6	**INSPECT FRONT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground: — Front HO2S terminal 1A (wiring harness-side) and body ground — Front HO2S terminal 1B (wiring harness-side) and body ground — Front HO2S terminal 1C (wiring harness-side) and body ground • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to the power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 9. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0133[L3 WITH TC]

id010239804800

DTC P0133	Front HO2S circuit slow response
DETECTION CONDITION	• The PCM monitors the peak differential value of oxygen sensor signal after A/F fluctuation being provided when the following conditions are met. If the peak differential value is lower than the threshold value. • The PCM determines that the front HO2S circuit is slow **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode — Following conditions are met: • Front HO2S heater monitor is completed. • Fuel system loop status is closed loop fuel control. — Engine speed: **1,350—3,500 rpm** — Charging efficiency: **21—71 %** (at engine speed: **2,500 rpm**) — Intake air volume: **5—40 g/s** — Engine coolant temperature **above 70 °C {158 °F}** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S malfunction • Front HO2S looseness • Fuel pressure sensor malfunction • Clogged or restricted fuel line • Fuel leakage in the fuel line between the fuel delivery pipe and the fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Improper connection purge solenoid hose • Insufficient compression • Engine malfunction (Engine coolant leakage)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the pending or stored DTCs using the M-MDS. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 14.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0133 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access the O2S11 PID using the M-MDS. • Inspect the PID under the following accelerator pedal conditions in NEUTRAL. • Is the PID normal? — **Less than 1mA** when the accelerator pedal is suddenly depressed (rich condition). — **More than 1mA** just after accelerator pedal is released (lean condition).	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if the front HO2S is loosely installed. • Is the front HO2S installed securely?	Yes	Go to the next step.
		No	Retighten the front HO2S, then go to Step 14.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if any gas leakage is found between the exhaust manifold and front HO2S. • Is there gas leakage?	Yes	Repair or replace the malfunctioning exhaust part, then go to Step 14.
		No	Replace sensor, then go to Step 14.
8	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor the FUEL PRES PID. • Is the FUEL PRES PID value within the specification? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 13.
		No	Go to the next step.
9	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 11.
10	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the fuel delivery pipe, then go to Step 14.
11	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump. • Monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Retest Step 14.
		No	Go to the next step.
12	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump. Then go to Step 14.
13	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.

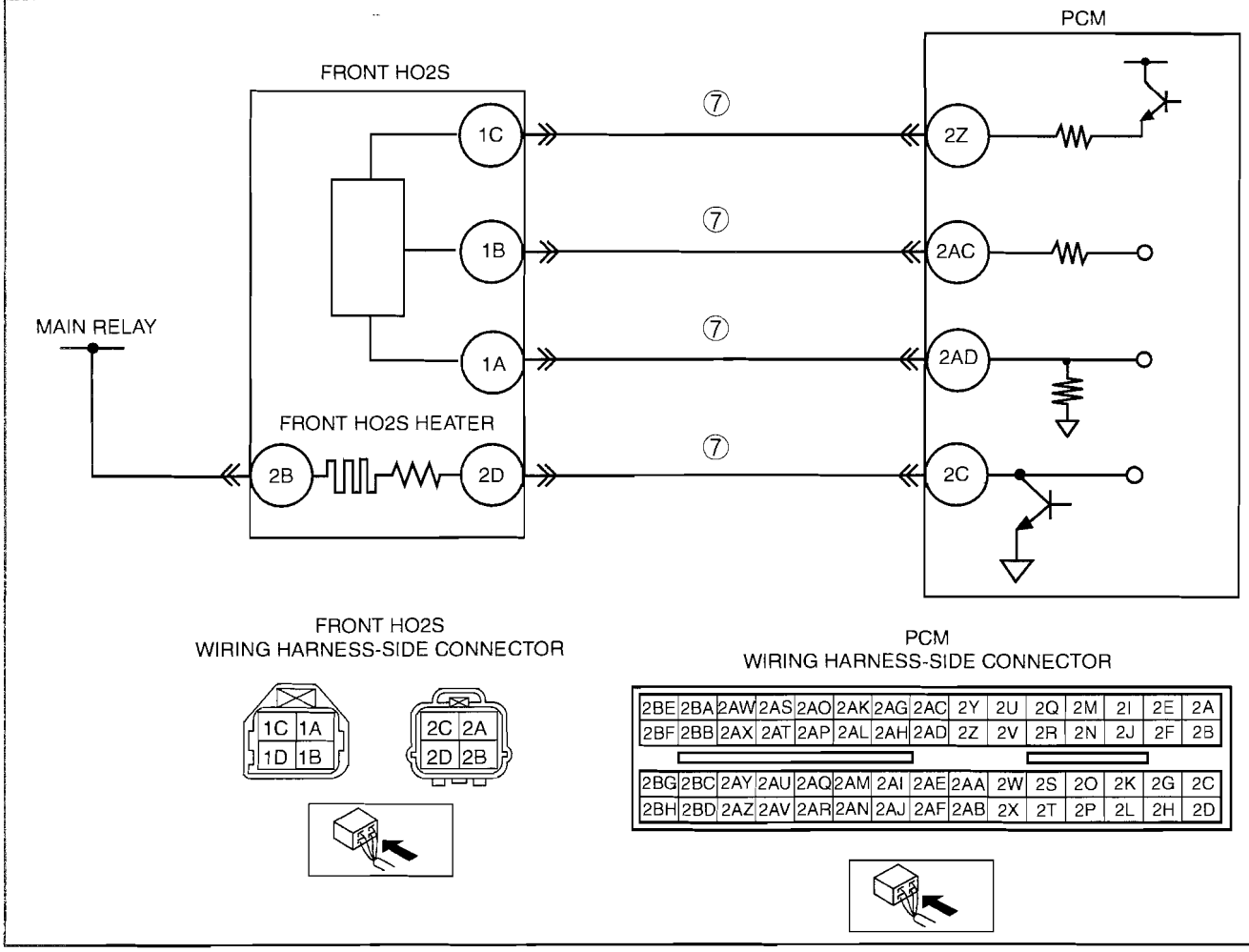
STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0134[L3 WITH TC]

id010239804900

DTC P0134	Front HO2S no activity detected
DETECTION CONDITION	• The PCM monitors the input voltage from the HO2S when the following conditions are met. If under the following monitoring conditions, the input voltage **more than 3.22 V**, the PCM determines that the front HO2S is not activated. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC Repair Verification Drive Mode — The following conditions are met • Front HO2S heater is tuned on for **above 30 s** • Battery voltage: **10—18 V** **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S deterioration • Front HO2S heater malfunction • Leakage exhaust system • Open or short circuit in the wiring harness between front HO2S terminal 2D and PCM terminal 2C • Open or short circuit in the wiring harness between front HO2S terminal 1C and PCM terminal 2Z • Open or short circuit in the wiring harness between front HO2S terminal 1B and PCM terminal 2AC • Open or short circuit in the wiring harness between front HO2S terminal 1A and PCM terminal 2AD • Insufficient compression • Engine malfunction

DTC P0134	Front HO2S no activity detected



Diagnostic procedure

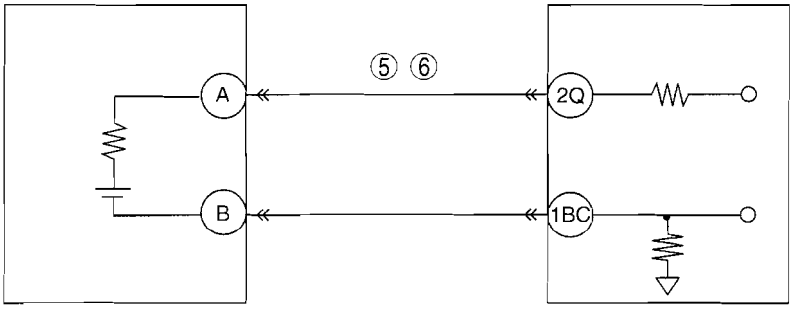
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** **Note** • If fuel monitor, DTC P0132 is retrieved, ignore it until P0134 is fixed. • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending and stored DTCs using the M-MDS. • Is the DTC P2237 or P2251 also present?	Yes	Go to the appropriate DTC troubleshooting procedures.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0134 on the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)

STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access O2S11 PID using the M-MDS. • Verify the PID while racing engine in NEUTRAL. • Is the PID normal? — **−1.0—1.0 A** when idle — Engine speed is **more than 3,000 rpm**. — **More than 0.25 mA** just after releasing the of accelerator pedal is released (lean condition)	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF FRONT HO2S** • Inspect if the front HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Install the sensor securely, then go to Step 10.
7	**INSPECT EXHAUST SYSTEM FOR GAS LEAKAGE** • Visually inspect if there is any gas leakage between the exhaust manifold and front HO2S. • Is there gas leakage?	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	• Inspect the following wiring harnesses at the wiring harness-side connector terminals for an open circuit, repair or the replace wiring harness if necessary. — Front HO2S terminal 1A and PCM terminal 2AD — Front HO2S terminal 1B and PCM terminal 2AC — Front HO2S terminal 1C and PCM terminal 2Z — Front HO2S terminal 2D and PCM terminal 2C • If all the items above are normal, replace the malfunctioning sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the ENGINE COOLANT LEAKAGE INSPECTION. (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 10.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Perform the engine overhaul for repairs, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode and the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

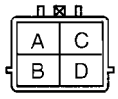
DTC P0137[L3 WITH TC]

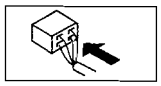
id010239805000

DTC P0137	Rear HO2S circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S. If the input voltage from the rear HO2S sensor is **below 0.1 V** for **35.2 s**, the PCM determines that the circuit input is low. **MONITORING CONDITIONS** — HO2S,HO2S heater and TWC repair verification drive mode. — The following conditions are met. • Engine speed is above **1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Fuel injector control in rear HO2S is in closed loop control. • The PCM monitors the input voltage from the rear HO2S when the following conditions are met. Under the following monitoring conditions, if the input voltage from the rear HO2S does not exceed **0.1 V** through the short term fuel trim is controlled up to **20.5%** for **9.6 s**, the PCM determines that the sensor circuit input is low. **MONITORING CONDITIONS** — HO2S,HO2S heater and TWC repair verification drive mode. — The following conditions are met for **more than 20.8 s**. • Engine speed is **more than 1,500 rpm**. • Engine coolant temperature is **more than 70 °C {158 °F}**. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Open circuit or short to ground in wiring between rear HO2S terminal A and PCM terminal 2Q • PCM malfunction



REAR HO2S
WIRING HARNESS-SIDE CONNECTOR

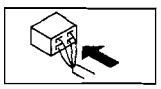




PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



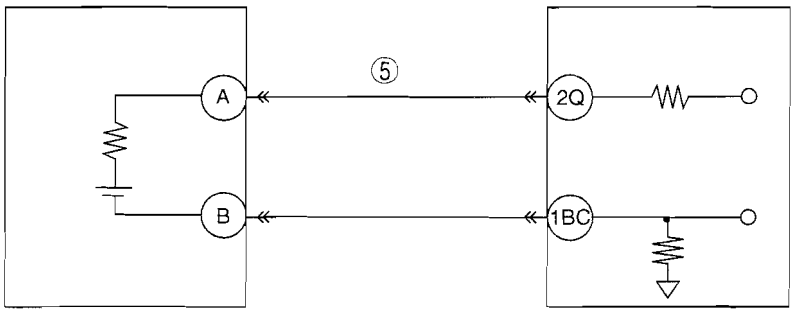
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedure. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0137 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO GROUND AT HARNESS** • Turn the ignition switch off. • Disconnect rear HO2S and PCM connectors. • Verify the continuity between rear HO2S sensor terminal A (wiring harness side) and body ground. • Is there continuity?	Yes	Repair for a short to ground circuit, then go to Step 7.
		No	Go to the next step.
6	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO GROUND AT REAR HO2S** • Rear HO2S connector disconnected. • Verify the continuity between rear HO2S sensor terminal A (part side) and body ground. • Is there continuity?	Yes	Replace the rear HO2S then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0137 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

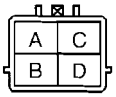
DTC P0138[L3 WITH TC]

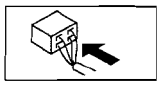
id010239805100

DTC P0138	Rear HO2S circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S. If the input voltage from the rear HO2S sensor is **above 1.2 V** for **0.8 s**, the PCM determines that the circuit input is high. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S malfunction • Short to power supply in the wiring harness between rear HO2S terminal A and PCM terminal 2Q • Rear HO2S or PCM terminal shorted • PCM malfunction



REAR HO2S
WIRING HARNESS-SIDE CONNECTOR

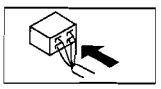




PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTC** • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending code or stored DTCs using M-MDS. • Is other DTC present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0138 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch off. • Disconnect rear HO2S connector. • Turn the ignition switch to the ON position. (Engine off) • Measure the voltage between rear HO2S terminal A (wiring harness-side) and body ground. • Is there any voltage?	Yes	Replace short to power supply, then go to Step 7.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Start the engine. • Access the O2S12 PID using the M-MDS. • Verify the PID while racing the engine at least **10 times** in NEUTRAL. • Does the PID stay **above 0.55 V**?	Yes	Replace the sensor, then go to the next step. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Run the PCM adaptive memory procedure drive mode and HO2S heater, HO2S, and TWC repair verification drive mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0139[L3 WITH TC]

id010239805200

DTC P0139	Rear HO2S circuit problem
DETECTION CONDITION	• The PCM monitors the rich (**0.4 V**) to lean (**0.3 V**) response time of the rear HO2S. The PCM measures the response time when the following conditions are met. The PCM determines that the rear HO2S response deteriorated when the measured response time is more than the threshold value (**130 ms**) five consecutive times. **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode or EGR, HO2S heater, HO2S, TWC, and EVAP System Repair Verification Drive Mode — The following conditions are met: • Fuel cut during deceleration • Engine speed is **more than 500 rpm**. • Engine coolant temperature is **more than 70 °C {158 °F}**. • HO2S (rear) output voltage is **more than 0.4 V**. • The PCM monitors for a time-out malfunction (when rear HO2S remains above **0.3 V** for longer than a specified period of time during fuel cut control). The PCM measure the amount of time from when the following conditions are met until the rear HO2S output voltage drops **below 0.3 V**. The PCM determines that a HO2S time-out malfunction has occurred when the detected time is more than the threshold value (**6.4 s**) three consecutive times. **MONITORING CONDITIONS** — HO2S heater, HO2S, and TWC Repair Verification Drive Mode or EGR, HO2S heater, HO2S, TWC, and EVAP System Repair Verification Drive Mode — The following conditions are met: • Fuel cut during deceleration • Engine speed is **more than 500 rpm**. • Engine coolant temperature is **more than 70 °C {158 °F}**. • HO2S (rear) is activated (**more than 0.55 V**). **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • DIAGNOSTIC MONITORING TEST RESULTS is available. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S malfunction • Rear HO2S looseness • Pressure regulator (built-in fuel pump unit) malfunction • Fuel pump malfunction • Fuel filter (built-in fuel pump unit) clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe to fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Improper connection of purge solenoid hoses • Insufficient compression • Engine malfunction (Leakage engine coolant)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING AND STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify pending and/or stored DTCs using the M-MDS. • Is DTC P0443 also present?	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0139 on the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access the O2S12 PID using the M-MDS. • Inspect the PID under the following accelerator pedal conditions or NEUTRAL. • Is the PID normal? — **More than 0.55 V** the accelerator pedal is suddenly depressed (rich condition). — **Less than 0.55 V** just after accelerator pedal is released (lean condition).	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF REAR HO2S** • Inspect if the rear HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 13.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually inspect if there is any gas leakage between the exhaust manifold and the rear HO2S. • Is there gas leakage?	Yes	Repair or replace the malfunctioning faulty exhaust part, then go to Step 13.
		No	Replace sensor, then go to Step 13.
8	**INSPECT LONG TERM FUEL TRIM** • Access the LONGFT1 PIDs • Compare it with the FREEZE FRAME DATA recorded at Step 1. • Is it below the FFD value?	Yes	The engine is driven under a rich condition. Go to the next step.
		No	The engine is driven under a lean condition. Go to Step 10.
9	**INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure)** • Turn the ignition switch off. • Inspect the fuel line pressure while the engine is running. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See01-14B-17 FUEL PUMP UNIT INSPECTION[L3 WITH TC].) • If there is any problem, repair or replace the parts. • If all items above are normal, replace the fuel pump unit. Then go to Step 13.
10	**INSPECT FUEL LINE PRESSURE (Low fuel line pressure)** • Turn the ignition switch off. • Inspect the fuel line pressure while the engine is running. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the fuel line pressure normal?	Yes	Go to Step 12.
		No	Go to the next step.
11	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect the fuel line for any leakage. • Is there fuel leakage?	Yes	Replace the fuel line, then go to Step 13.
		No	Inspect the fuel filters for the following: • Foreign material or staining inside the fuel filter (low-pressure side) Perform the following actions according to the result. • If foreign material or staining is found inside fuel filter (low-pressure side), clean the fuel tank and filter. • If normal, replace fuel pump unit. Then go to Step 13.

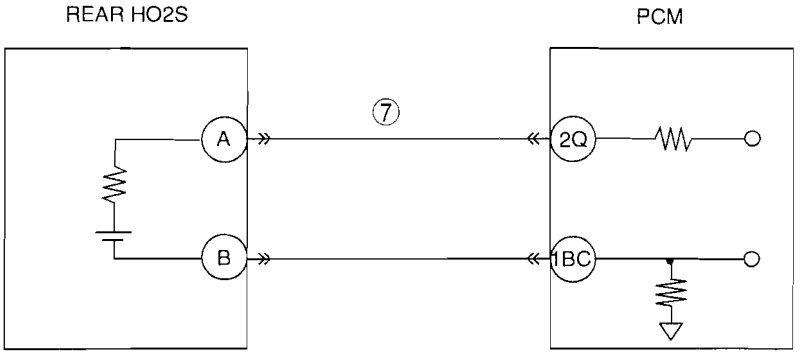
STEP	INSPECTION		ACTION
12	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the "ENGINE COOLANT LEAKAGE INSPECTION." (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results. Then go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0140[L3 WITH TC]

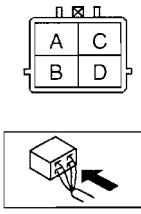
id010239805300

DTC P0140	Rear HO2S no activity detected
DETECTION CONDITION	• The PCM monitors the input voltage from the rear HO2S when the following conditions are met. Under the following monitoring conditions, if the input voltage from the rear HO2S does not even **exceed 0.55 V** though the short term fuel trim is controlled up to **20.5%** for **9.6 s**, the PCM determines that sensor circuit is not activated. **MONITORING CONDITIONS** — HO2S, HO2S heater and TWC repair verification drive mode — The following conditions are met for **above 20.8 s**. • Engine speed is **above 1,500 rpm**. • Engine coolant temperature is **above 70 °C {158 °F}**. • Rear HO2S voltage is **above0.1V**. **Diagnostic support note** • This is an intermittent monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.

DTC P0140	Rear HO2S no activity detected
POSSIBLE CAUSE	• Rear HO2S deterioration • Rear HO2S heater malfunction • Exhaust system leakage • Open circuit or short to ground in the wiring harness between rear HO2S terminal A and PCM terminal 2Q • Insufficient compression • Engine malfunction



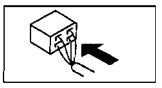
REAR HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

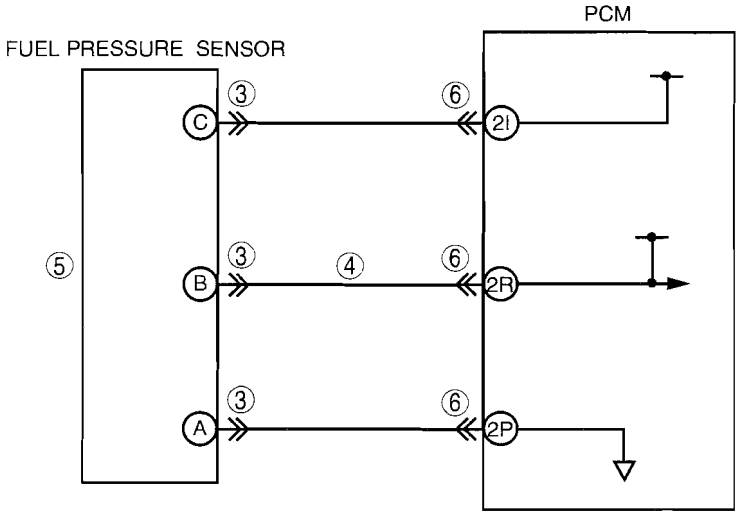
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** **Note** • If the fuel monitor, DTC P0132 is retrieved, ignore it until P0140 is fixed. • Turn the ignition switch off, then to the ON position. (Engine off) • Verify pending and stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting procedures. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P0140 on the FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Warm up the engine. • Access the O2S12 or the P0140 PID using the M-MDS. • Verify the PID while racing the engine at least **10 times** in NEUTRAL. • Is the PID reading normal? — **More than 0.55 V** at least once during engine racing	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT INSTALLATION OF REAR HO2S** • Check if the rear HO2S is loosely installed. • Is the sensor installed securely?	Yes	Go to the next step.
		No	Install the sensor securely, then go to Step 10.
7	**INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM** • Visually check if any gas leakage is found between the exhaust pipe and the rear HO2S. • Is there gas leakage?	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	• Inspect the following wiring harness for an open or short to the ground circuit, repair or replace the wiring harness if necessary. — Rear HO2S terminal A (wiring harness-side) to PCM terminal 2Q (wiring harness-side) • Repair or replace the wiring harness if necessary. • If all items above are normal, replace the malfunctioning sensor. Then go to Step 10.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the ENGINE COOLANT LEAKAGE INSPECTION. (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is the cooling system hold pressure normal?	Yes	Repair or the replace the malfunctioning part according to the inspection result. Then go to Step 10.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. (Engine off) • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

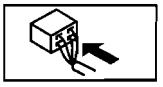
DTC P0192[L3 WITH TC]

id010239805400

DTC P0192	Fuel pressure sensor circuit low input
DETECTION CONDITION	• If the input voltage from the fuel pressure sensor is less than **0.19 V** for **1.3 s**, the PCM determines that the fuel pressure sensor circuit is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel pressure sensor malfunction • Short to ground in wiring harness between fuel pressure sensor terminal B and PCM terminal 2R • Connector or terminal malfunction • PCM malfunction

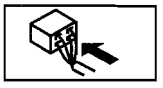


FUEL PRESSURE SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



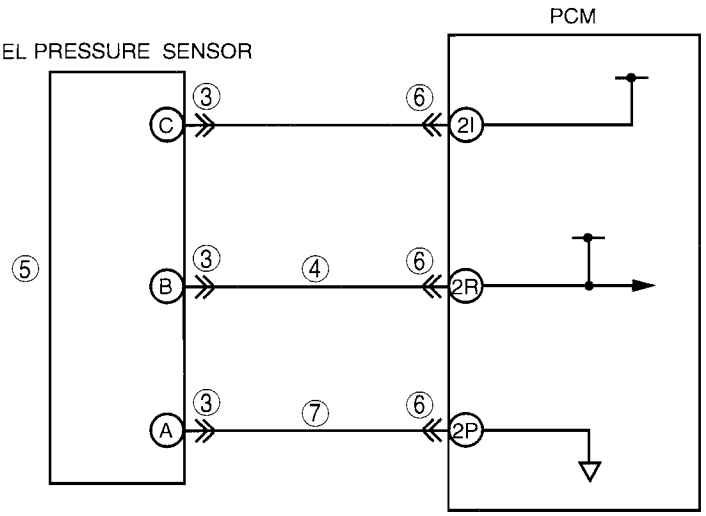
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL PRESSURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel pressure sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT FUEL PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the fuel pressure sensor terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 7.
		No	Go to the next step.
5	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the fuel pressure sensor, then go to Step 7. (See01-40B-38 FUEL PRESSURE SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0192 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

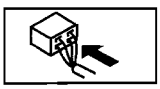
DTC P0193[L3 WITH TC]

id010239805500

DTC P0193	Fuel pressure sensor circuit high input
DETECTION CONDITION	• If the input voltage from the fuel pressure sensor is more than **4.8 V** for **1.3 s**, the PCM determines that the fuel pressure sensor circuit is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel pressure sensor malfunction • Open circuit in the wiring harness between fuel pressure sensor terminal A and PCM terminal 2P • Open circuit in the wiring harness between fuel pressure sensor terminal B and PCM terminal 2R • Short to power in the wiring harness between fuel pressure sensor terminal B and PCM terminal 2R • Connector or terminal malfunction • PCM malfunction

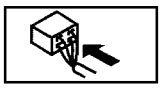


FUEL PRESSURE SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



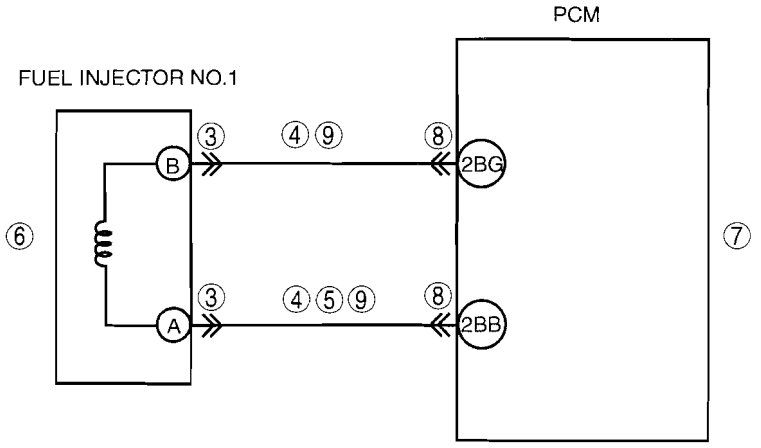
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL PRESSURE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel pressure sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT FUEL PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the fuel pressure sensor terminal B (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to the Step 8.
		No	Go to the next step.
5	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction**?**	Yes	Replace the fuel pressure sensor, then go to Step 8. (See01-40B-38 FUEL PRESSURE SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT FUEL PRESSURE SENSOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the fuel pressure sensor terminal A (wiring harness-side) and PCM terminal 2P (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0193 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0201[L3 WITH TC]

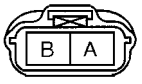
id010239805600

DTC P0201	Injector circuit/open cylinder No.1
DETECTION CONDITION	• If the fuel injection verification signal is not input at **255 times** continuously even though the PCM drives the fuel injector No.1, the PCM determines that there is an open circuit in the fuel injector No.1 control circuit. **MONITORING CONDITION** — The following conditions are met: • Engine speed: **4,000 rpm or less** • Battery voltage: **10.03 V or more** • Fuel injection control: except during fuel cut **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel injector No.1 malfunction • Connector or terminal malfunction • Open circuit between fuel injector No.1 terminal B and PCM terminal 2BG • Open circuit between fuel injector No.1 terminal A and PCM terminal 2BB • Short to power supply between fuel injector No.1 terminal A and PCM terminal 2BB • Short to ground between fuel injector No.1 terminal B and PCM terminal 2BG • Short to ground between fuel injector No.1 terminal A and PCM terminal 2BB • PCM malfunction

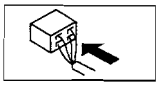


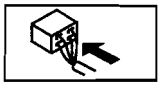
FUEL INJECTOR NO.1
WIRING HARNESS-SIDE CONNECTOR

PCM
WIRING HARNESS-SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

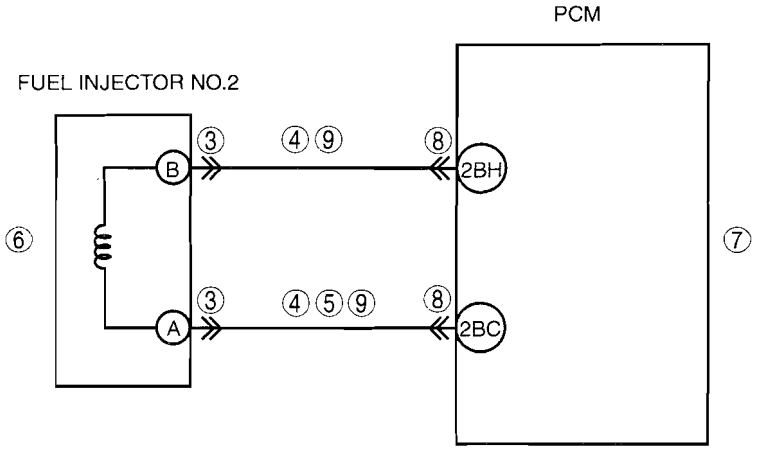
STEP	INSPECTION		ACTION
3	**INSPECT FUEL INJECTOR NO.1 CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel injector No.1 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	**INSPECT FUEL INJECTOR NO.1 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.1 terminal B (wiring harness-side) and body ground — Fuel injector No.1 terminal A (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
5	**INSPECT FUEL INJECTOR NO.1 CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the fuel injector No.1 terminal A (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FUEL INJECTOR NO.1** • Inspect the fuel injector No.1. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction**?**	Yes	Replace fuel injector No.1, then go to Step 10. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM** • Inspect the PCM. • Is there malfunction?	Yes	Replace the PCM, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR NO.1 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.1 terminal B (wiring harness-side) and PCM terminal 2BG (wiring harness-side) — Fuel injector No.1 terminal A (wiring harness-side) and PCM terminal 2BB (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0201 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

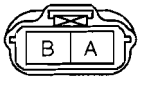
DTC P0202[L3 WITH TC]

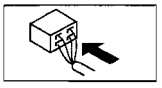
id010239805700

DTC P0202	Injector circuit/open cylinder No.2
DETECTION CONDITION	• If the fuel injection verification signal is not input at **255 times** continuously even though the PCM drives the fuel injector No.2, the PCM determines that there is an open circuit in the fuel injector No.2 control circuit. **MONITORING CONDITION** — The following conditions are met: • Engine speed: **4,000 rpm or less** • Battery voltage: **10.03 V or more** • Fuel injection control: except during fuel cut **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel injector No.2 malfunction • Connector or terminal malfunction • Open circuit between fuel injector No.2 terminal B and PCM terminal 2BH • Open circuit between fuel injector No.2 terminal A and PCM terminal 2BC • Short to power supply between fuel injector No.2 terminal A and PCM terminal 2BC • Short to ground between fuel injector No.2 terminal B and PCM terminal 2BH • Short to ground between fuel injector No.2 terminal A and PCM terminal 2BC • PCM malfunction



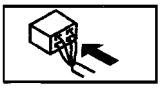
FUEL INJECTOR NO.2
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL INJECTOR NO.2 CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel injector No.2 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	**INSPECT FUEL INJECTOR NO.2 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.2 terminal B (wiring harness-side) and body ground — Fuel injector No.2 terminal A (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
5	**INSPECT FUEL INJECTOR NO.2 CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the fuel injector No.2 terminal A (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FUEL INJECTOR NO.2** • Inspect the fuel injector No.2. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction**?**	Yes	Replace the fuel injector No.2, then go to Step 10. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM** • Inspect the PCM. • Is there malfunction?	Yes	Replace the PCM, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR NO.2 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.2 terminal B (wiring harness-side) and PCM terminal 2BH (wiring harness-side) — Fuel injector No.2 terminal A (wiring harness-side) and PCM terminal 2BC (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.

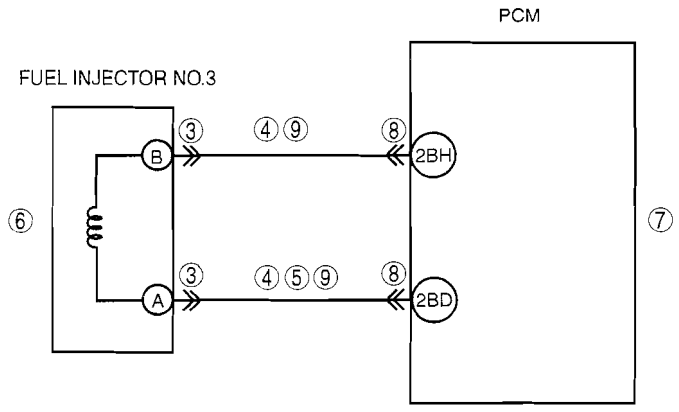
STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0202 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0203[L3 WITH TC]

id010239805800

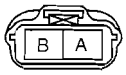
DTC P0203	Injector circuit/open cylinder No.3
DETECTION CONDITION	• If the fuel injection verification signal is not input at **255 times** continuously even though the PCM drives fuel injector No.3, the PCM determines that there is an open circuit in the fuel injector No.3 control circuit. **MONITORING CONDITION** — The following conditions are met: • Engine speed: **4,000 rpm or less** • Battery voltage: **10.03 V or more** • Fuel injection control: except during fuel cut **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel injector No.3 malfunction • Connector or terminal malfunction • Open circuit between fuel injector No.3 terminal B and PCM terminal 2BH • Open circuit between fuel injector No.3 terminal A and PCM terminal 2BD • Short to power supply between fuel injector No.3 terminal A and PCM terminal 2BD • Short to ground between fuel injector No.3 terminal B and PCM terminal 2BH • Short to ground between fuel injector No.3 terminal A and PCM terminal 2BD • PCM malfunction

DTC P0203	Injector circuit/open cylinder No.3

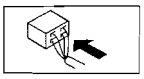


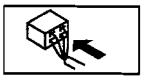
FUEL INJECTOR NO.3
WIRING HARNESS-SIDE CONNECTOR

PCM
WIRING HARNESS-SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL INJECTOR NO.3 CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel injector No.3 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
4	**INSPECT FUEL INJECTOR NO.3 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.3 terminal B (wiring harness-side) and body ground — Fuel injector No.3 terminal A (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
5	**INSPECT FUEL INJECTOR NO.3 CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the fuel injector No.3 terminal A (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.

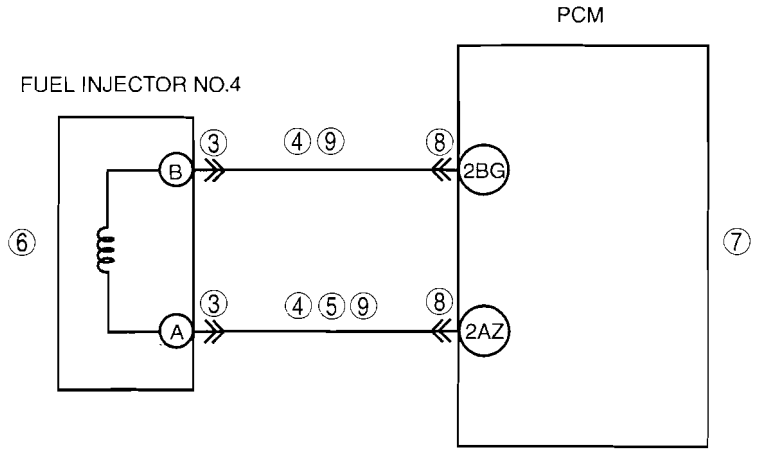
STEP	INSPECTION		ACTION
6	**INSPECT FUEL INJECTOR NO.3** • Inspect fuel injector No.3. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace fuel injector No.3, then go to Step 10. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM** • Inspect the PCM. • Is there malfunction?	Yes	Replace the PCM, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR NO.3 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.3 terminal B (wiring harness-side) and PCM terminal 2BH (wiring harness-side) — Fuel injector No.3 terminal A (wiring harness-side) and PCM terminal 2BD (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0203 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0204[L3 WITH TC]

id010239805900

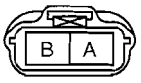
DTC P0204	Injector circuit/open cylinder No.4
DETECTION CONDITION	• If the fuel injection verification signal is not input at **255 times** continuously even though the PCM drives fuel injector No.4, the PCM determines that there is an open circuit in the fuel injector No.4 control circuit. **MONITORING CONDITION** — The following conditions are met: • Engine speed: **4,000 rpm or less** • Battery voltage: **10.03 V or more** • Fuel injection control: except during fuel cut **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.

DTC P0204	Injector circuit/open cylinder No.4
POSSIBLE CAUSE	• Fuel injector No.4 malfunction • Connector or terminal malfunction • Open circuit between fuel injector No.4 terminal B and PCM terminal 2BG • Open circuit between fuel injector No.4 terminal A and PCM terminal 2AZ • Short to power supply between fuel injector No.4 terminal A and PCM terminal 2AZ • Short to ground between fuel injector No.4 terminal B and PCM terminal 2BG • Short to ground between fuel injector No.4 terminal A and PCM terminal 2AZ • PCM malfunction

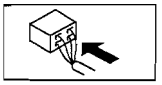


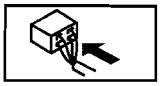
FUEL INJECTOR NO.4
WIRING HARNESS-SIDE CONNECTOR

PCM
WIRING HARNESS-SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

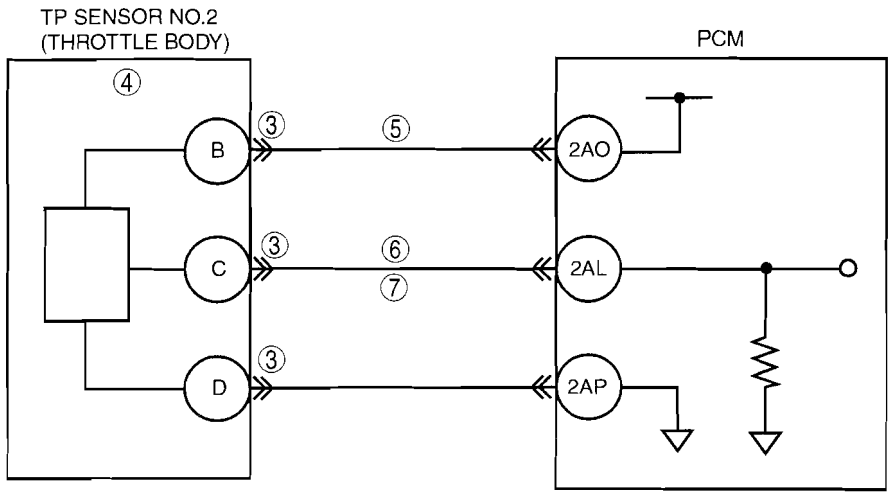
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL INJECTOR NO.4 CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fuel injector No.4 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT FUEL INJECTOR NO.4 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.4 terminal B (wiring harness-side) and body ground — Fuel injector No.4 terminal A (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
5	**INSPECT FUEL INJECTOR NO.4 CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the fuel injector No.4 terminal A (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 10.
		No	Go to the next step.
6	**INSPECT FUEL INJECTOR NO.4** • Inspect fuel injector No.4. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction**?**	Yes	Replace fuel injector No.4, then go to Step 10. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**INSPECT PCM** • Inspect the PCM. • Is there any malfunction?	Yes	Replace the PCM, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR NO.4 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Fuel injector No.4 terminal B (wiring harness-side) and PCM terminal 2BG (wiring harness-side) — Fuel injector No.4 terminal A (wiring harness-side) and PCM terminal 2AZ (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0204 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

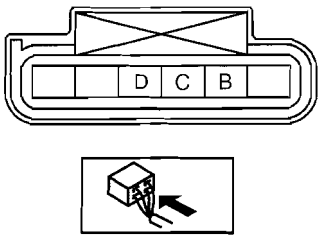
DTC P0222[L3 WITH TC]

id010239806000

DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	• If PCM detects that the TP sensor No.2 voltage is **below 0.2 V** after the ignition switch to the ON position, the PCM determines that TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal C and PCM terminal 2AL • Short to ground between throttle body terminal C and PCM terminal 2AL • Open circuit between throttle body terminal B and PCM terminal 2AO • Short to ground between throttle body terminal B and PCM terminal 2AO • PCM malfunction



THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

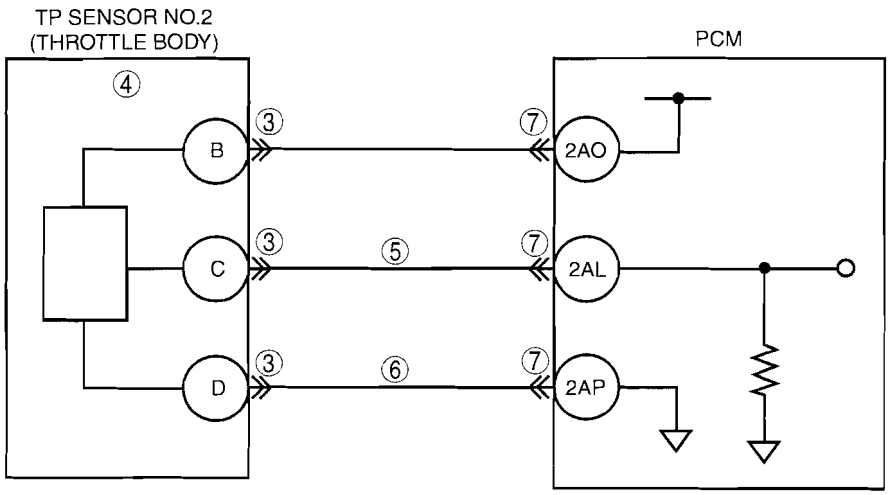
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT TP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the TP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
3	**CLASSIFY TP SENSOR OR HARNESS MALFUNCTION** • Connect the M-MDS. • Access the TP2 PID. • Disconnect the throttle body connector. • Connect a jumper wire between throttle body terminals B and C (harness-side). • Is the voltage**above 4.9 V?**	Yes	Go to the next step.
		No	Go to step 5.
4	**INSPECT TP SENSOR** • Perform the TP sensor inspection. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) • Is the TP sensor normal?	Yes	Inspect throttle body connector terminal B connection for poor connection. Repair or replace if necessary, then go to Step 8.
		No	Replace throttle body, then go to Step 8.
5	**INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR** **Note** • If DTC P0107 and P2228 are also retrieved with P0122, go to the CONSTANT VOLTAGE troubleshooting procedure. • Turn ignition switch to the ON position (Engine off). • Measure the voltage at throttle body terminal B (harness-side). • Is the voltage**within 4.5—5.5 V?**	Yes	Go to the next step.
		No	Repair or replace for an open circuit between throttle body connector terminal B and PCM connector terminal 2AO (harness-side). Then, then go to Step 8.
6	**INSPECT TP2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between throttle body terminal C (harness-side) and PCM terminal 2AL. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness, then go to Step 8.
7	**INSPECT TP2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between throttle body terminal C (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

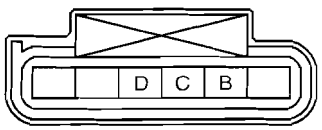
DTC P0223[L3 WITH TC]

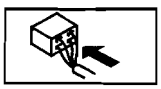
id010239806100

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	• If the PCM detects that the TP sensor No.2 voltage is **above 4.85 V** after the ignition switch to the ON position, the PCM determines that the TP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal D and PCM terminal 2AP • Short to power supply between throttle body terminal C and PCM terminal 2AL • PCM malfunction



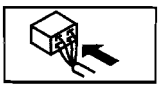
THROTTLE BODY
HARNESS SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the suspected terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT TP SENSOR** • Perform the TP sensor inspection. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC]) • Is the TP sensor normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 8.
5	**INSPECT TP2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal C (harness-side) and body ground. • Is the voltage **above 4.9 V?**	Yes	Repair or replace for a short to a power supply. Then, go to Step 8.
		No	Go to the next step.
6	**INSPECT TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between throttle body connector terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace for an open circuit between throttle body terminal D (harness-side) and PCM connector terminal 2AP (harness-side). Then, go to Step 8.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0234[L3 WITH TC]

id010239806200

DTC P0234	Turbocharger over boost condition
DETECTION CONDITION	• If the manifold absolute pressure or charging efficiency are more than the specification for the specified period of time, the PCM determines that the turbocharger is in an over boost condition. **MONITORING CONDITIONS** — Engine speed is **2,000 rpm or more.** **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Wastegate control solenoid valve malfunction • Wastegate is stuck close • Vacuum hose looseness or damage • Improper installation of the vacuum hose

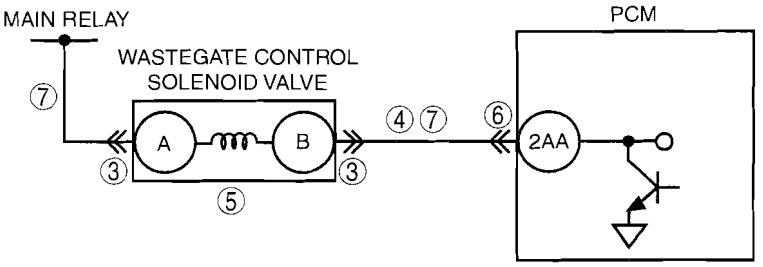
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT WASTEGATE CONTROL SOLENOID VALVE** • Inspect the wastegate control solenoid valve. (See01-13B-16 WASTEGATE CONTROL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the wastegate control solenoid valve, then go to Step 5. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT VACUUM HOSE** • Inspect the vacuum hose condition for the following: — Looseness — Damage — Improper installation • Is there any malfunction?	Yes	Repair or replace the suspected part, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0234 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

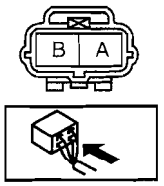
DTC P0245[L3 WITH TC]

id010239806300

DTC P0245	Turbocharger wastegate solenoid low
DETECTION CONDITION	• When the PCM turns the wastegate control solenoid valve off but the wastegate control solenoid valve circuit voltage is low, the PCM determines that the wastegate control solenoid valve control circuit voltage is low. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Wastegate control solenoid valve malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between wastegate control solenoid valve terminal A and main relay • Open circuit in the wiring harness between wastegate control solenoid valve terminal B and PCM terminal 2AA • Short to ground in the wiring harness between wastegate control solenoid valve terminal B and PCM terminal 2AA • PCM malfunction

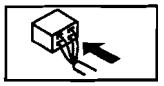


WASTEGATE CONTROL SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



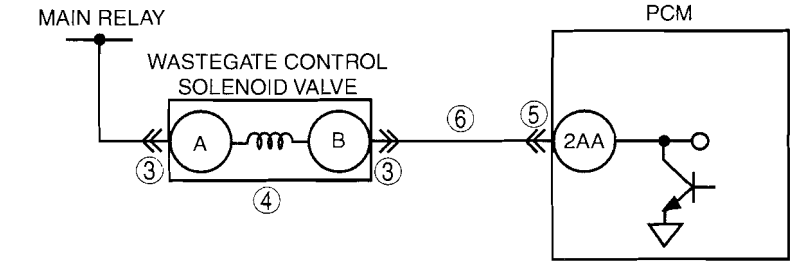
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT WASTEGATE CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the wastegate control solenoid valve connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT WASTEGATE CONTROL SOLENOID VALVE CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the wastegate control solenoid valve terminal B and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	**INSPECT WASTEGATE CONTROL SOLENOID VALVE** • Inspect the wastegate control solenoid valve. (See01-13B-16 WASTEGATE CONTROL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the wastegate control solenoid valve, then go to Step 8. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT WASTEGATE CONTROL SOLENOID VALVE GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — Wastegate control solenoid valve terminal A (wiring harness-side) and main relay — Wastegate control solenoid valve terminal B (wiring harness-side) and PCM terminal 2AA (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0245 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

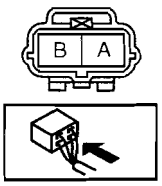
DTC P0246[L3 WITH TC]

id010239806400

DTC P0246	Turbocharger wastegate solenoid high
DETECTION CONDITION	• When the PCM turns the wastegate control solenoid valve on but the wastegate control solenoid valve circuit voltage is high, the PCM determines that the wastegate control solenoid valve control circuit voltage is high. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Wastegate control solenoid valve malfunction • Connector or terminal malfunction • Short to power supply in the wiring harness between wastegate control solenoid valve terminal B and PCM terminal 2AA • PCM malfunction

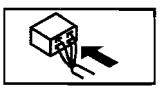


WASTEGATE CONTROL SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT WASTEGATE CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the wastegate control solenoid valve connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT WASTEGATE CONTROL SOLENOID VALVE** • Inspect the wastegate control solenoid valve. (See01-13B-16 WASTEGATE CONTROL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the wastegate control solenoid valve, then go to Step 7. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT WASTEGATE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position. • Inspect for continuity between the wastegate control solenoid valve terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0246 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P0300[L3 WITH TC]

id010239806500

DTC P0300	Random misfire detected
DETECTION CONDITION	• The PCM monitors the CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates a misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects a misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects a misfire which can damage the catalytic converter during the first drive cycle. • PENDING CODE is available if the PCM detects a misfire which affects emission performance during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • CMP sensor malfunction • Ignition coil malfunction • Ignition system malfunction • MAF sensor contamination • Excess air suction in intake air system (between MAF sensor and intake manifold) • Fuel pump malfunction • High pressure fuel pump malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • Improper fuel pump speed control operation • Fuel pressure regulator (built-in fuel pump unit) malfunction • Fuel line clogged • Fuel filter clogged • Fuel leakage in fuel line • Fuel runout • Poor quality fuel • Purge control solenoid valve malfunction • PCV valve malfunction • EGR valve malfunction • Vacuum hoses damage or improper connection • Related connector and terminal malfunction • Related wiring harness malfunction • Insufficient compression • Variable valve timing control system improper

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP, and VSS PIDs using the M-MDS. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) • Is there any signal that is far out of specification when the ignition switch is turned to the ON position and the engine idles?	Yes	Inspect the suspected circuit and/or part according to the inspection results. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) Then go to Step 26.
		No	Go to the next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the suspected circuit and/or part according to the inspection results. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) Then go to Step 26.
		No	Go to the next step.
6	**INSPECT CMP SENSOR** • Inspect the CMP sensor. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].) • Is the CMP sensor normal?	Yes	Go to the next step.
		No	Inspect the installation condition for damage to the timing chain and gears, repair the malfunctioning part. • If it is normal, replace the CMP sensor. Then go to Step 26.
7	**VERIFY CKP SENSOR INSTALLATION CONDITION** • Inspect the CKP sensor for looseness. • Is the CKP sensor loose?	Yes	Retighten the CKP sensor, then go to Step.
		No	Go to the next step.
8	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related wiring harness condition (intermittent open or short) for all cylinders. • Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the suspected wiring harnesses, then go to Step 26.
9	**INSPECT IGNITION SYSTEM OPERATION** • Carry the out spark test. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC]) • Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the spark test result. Then go to Step 26.
10	**INSPECT MAF PID** • Start the engine. • Access the MAF PID using the M-MDS. • Race the engine and verify that the MAF PID changes quickly according to the change in the engine speed. • Is the MAF PID response normal?	Yes	Go to the next step.
		No	Replace the MAF sensor, then go to Step 26.
11	**INSPECT IN INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Inspect for air leakage at the following: — Between the MAF sensor and throttle body — Between throttle body and intake manifold • Is there any malfunction?	Yes	Repair or replace suspected part, then go to Step 26.
		No	Go to the next step.
12	**INSPECT FUEL LINE PRESSURE** • Inspect fuel line pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the fuel line pressure normal?	Yes	Go to Step 14.
		No	If the fuel line pressure is too low, go to the next step. If the fuel line pressure is too high, replace the fuel pump unit, then go to Step 26.
13	**INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE** • Visually inspect fuel line for fuel leakage. • Is there any fuel leakage?	Yes	Replace suspected fuel line, then go to Step 20.
		No	Inspect the fuel filters for following: • Foreign material or stain inside fuel filter (low-pressure side) Perform following actions depend on the result above. • If foreign materials or stain is found inside fuel filter (low-pressure side), clean the fuel tank and filter (low-pressure side). • If normal, replace the fuel pump unit. Then, go to Step 26.

STEP	INSPECTION		ACTION
14	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to Step 26.
15	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect variable valve timing control system operation. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC]) • Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the variable valve timing control system inspection results, then go to Step 26.
16	**INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE** • Turn the ignition switch off. • Connect the vacuum pump to the purge control solenoid valve and apply vacuum to the solenoid. • Verify that the solenoid holds vacuum. • Turn the ignition switch to the ON position (Engine off). • Access EVAPCP PID in the SIMULATION TEST using the M-MDS. • Set duty value to **100%** for the EVAPCP PID. • Apply vacuum while turning the solenoid from OFF to ON and simulating the EVAPCP PID with a **100%** duty value. • Verify that the solenoid releases vacuum while the solenoid is turned on. • Is the purge control solenoid valve operation normal?	Yes	Go to the next step.
		No	Replace the purge control solenoid valve, then go to Step 26.
17	**INSPECT PCV VALVE OPERATION** • Turn the ignition switch off. • Remove the PCV valve and inspect the valve operation. (See01-16B-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[L3 WITH TC].) • Is the PCV valve operation normal?	Yes	Replace the PCV valve, then go to Step 26.
		No	Go to the next step.
18	**INSPECT OPERATION OF EGR VALVE** • Remove the EGR valve. • Visually inspect the if EGR valve is stuck open. • Is the EGR valve stuck open?	Yes	Repair or replace the EGR valve, then go to Step 26.
		No	Go to the next step.
19	**VERIFY FUEL PUMP SPEED CONTROL OPERATION** • Perform Fuel Pump Speed Control Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the fuel pump speed control work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to inspection results. Then go to Step 26.
20	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor the FUEL_PRES PID. • Is the FUEL_PRES PID value within the specification? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 24.
		No	Go to the next step.
21	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 23.
22	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the fuel delivery pipe, then go to Step 26.

STEP	INSPECTION		ACTION
23	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 26.
		No	Go to the next step.
24	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following. • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.Then go to Step 26.
25	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to the next step.
		No	Go to the next step.
26	**VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
27	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0301, P0302, P0303, P0304[L3 WITH TC]

id010239806600

DTC P0301 DTC P0302 DTC P0303 DTC P0304	**Cylinder No.1 misfire detected** **Cylinder No.2 misfire detected** **Cylinder No.3 misfire detected** **Cylinder No.4 misfire detected**
DETECTION CONDITION	• The PCM monitors the CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates a misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (Misfire). • The MIL illuminates if the PCM detects a misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The MIL flashes if the PCM detects a misfire which can damage the catalytic converter during the first drive cycle. • PENDING CODE is available if the PCM detects a misfire which affects emission performance during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Spark plug malfunction • Ignition coil malfunction • Ignition system malfunction • Fuel injector malfunction • Air suction in intake air system (between dynamic chamber and cylinder head) • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON /IDLE)** • Access APP1, APP2, ECT, IAT, MAF, RPM, TP and VSS PIDs using the M-MDS. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) • Is there any signal that is far out of specification when the ignition switch is turned to the ON position and the engine idles?	Yes	Inspect the suspected circuit and/or part according to inspection results. Then go to Step 14. (See01-40B-7 PCM INSPECTION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as in Step 4 while simulating the FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the suspected circuit and/or part according to inspection results. Then go to Step 14. (See01-40B-7 PCM INSPECTION[L3 WITH TC].)
		No	Go to the next step.

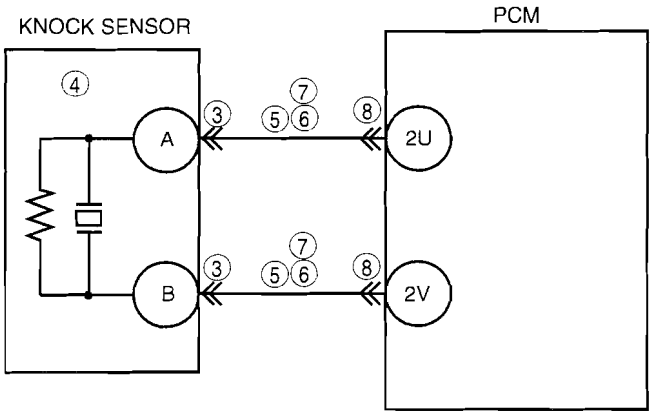
STEP	INSPECTION		ACTION
6	**INSPECT SPARK PLUG CONDITION** • Turn the ignition switch off. • Remove the spark plug from the suspected cylinder. • Inspect the spark plug condition: — Cracks — Excess wear — Gap — Wetness • Is there any problem found on the spark plug?	Yes	• If a spark plug is wet, fuel flooding is suspected. Then go to Step 14. • If a spark plug has cracks, excessive wear or an improper gap, replace the malfunctioning spark plug. Then go to Step 14.
		No	Go to the next step.
7	**INSPECT INTAKE-AIR SYSTEM FOR AIR SUCTION** • Inspect for air leakage at the following: — Around connection of dynamic chamber and intake manifold — Around connection of intake manifold and cylinder head • Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 14.
		No	Go to the next step.
8	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform "ENGINE COOLANT LEAKAGE INSPECTION." (See01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results. Then go to Step 14.
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR WIRING HARNESS** • Remove the intake air system parts. • Disconnect the fuel injector connector on suspected cylinder. • Connect the NOID LIGHT to the fuel injector terminals. • Inspect the light dim during cranking. • Does the light not illuminate?	Yes	Go to the next step.
		No	Inspect the fuel injector wiring harnesses. Repair or replace if necessary, then go to Step 14.
10	**INSPECT IGNITION COIL HARNESSES** • Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) of the suspected cylinder. • Are the wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the suspected wiring harnesses, then go to Step 14.
11	**INSPECT IGNITION SYSTEM OPERATION** • Carry out the spark test. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC]) • Is a strong blue spark visible at the suspected cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the spark test result. Then go to Step 14.
12	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is the engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to the next step.
13	**INSPECT FUEL INJECTOR OPERATION** • Connect the M-MDS to DLC-2. • Access INJ#1, INJ#2, INJ#3, INJ#4 PIDs. • Start the engine and warm it up to the normal operating temperature. • Turn the fuel injector off from on using the PID simulation function. • Does the engine speed decrease while the fuel injectors are turned off?	Yes	Go to Step 14.
		No	Go to the next step.

STEP	INSPECTION		ACTION
14	**VERIFY IF TROUBLESHOOTING OF MISFIRE DTC COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

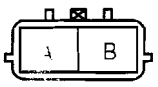
DTC P0327[L3 WITH TC]

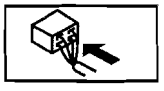
id010239806700

DTC P0327	Knock sensor circuit low input
DETECTION CONDITION	• PCM monitors the input signal from the knock sensor when the engine is running. If the input voltage at the PCM terminals between 2V and 2U is **below 0.12 V**, the PCM determines that the knock sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Open or short to ground circuit between knock sensor connector terminal A and PCM terminal 2U • Open or short to ground circuit between knock sensor connector terminal B and PCM terminal 2V • Knock sensor wires (2) shorted • PCM malfunction



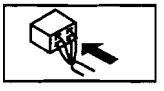
KNOCK SENSOR
WIRING HARNESS SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



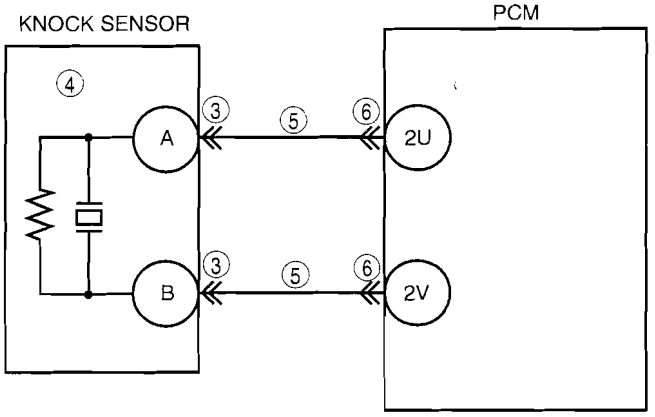
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT KNOCK SENSOR CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the knock sensor connector. • Check for poor connection at terminals A and B (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT KNOCK SENSOR** • Perform the knock sensor inspection. (See01-40B-49 KNOCK SENSOR (KS) INSPECTION[L3 WITH TC]) • Is the knock sensor normal?	Yes	Go to the next step.
		No	Replace the knock sensor, then go to the next step.
5	**INSPECT KNOCK SENSOR CIRCUITS FOR OPEN CIRCUIT** • Disconnect the knock sensor connector. • Inspect the continuity between the following circuits: — Knock sensor female terminal A (harness-side) and PCM terminal 2U (harness-side) — Knock sensor female terminal B (harness-side) and PCM terminal 2V (harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness, then go to Step 9.
6	**INSPECT KNOCK SENSOR CIRCUITS FOR SHORT TO GROUND** • Inspect the continuity between the following circuits: — Knock sensor female terminal A (harness-side) and body ground — Knock sensor female terminal B (harness-side) and body ground • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FOR SHORT CIRCUITS** • Inspect for continuity between knock sensor female terminals A and B (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 9.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at terminals 2V and 2U (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to the next step.
		No	Go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

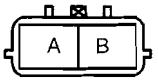
DTC P0328[L3 WITH TC]

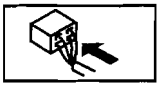
id010239806800

DTC P0328	Knock sensor circuit high input
DETECTION CONDITION	• PCM monitors the input signal from the knock sensor when the engine is running. If the input voltage at the PCM terminals between 2V and 2U is **above 4.9 V**, the PCM determines that the knock sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Knock sensor malfunction • Connector or terminal malfunction • Short to the power supply in the wiring harness between knock sensor terminal A and PCM terminal 2U • Short to the power supply in the wiring harness between knock sensor terminal B and PCM terminal 2V • PCM malfunction



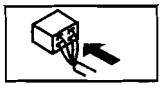
KNOCK SENSOR
WIRING HARNESS SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



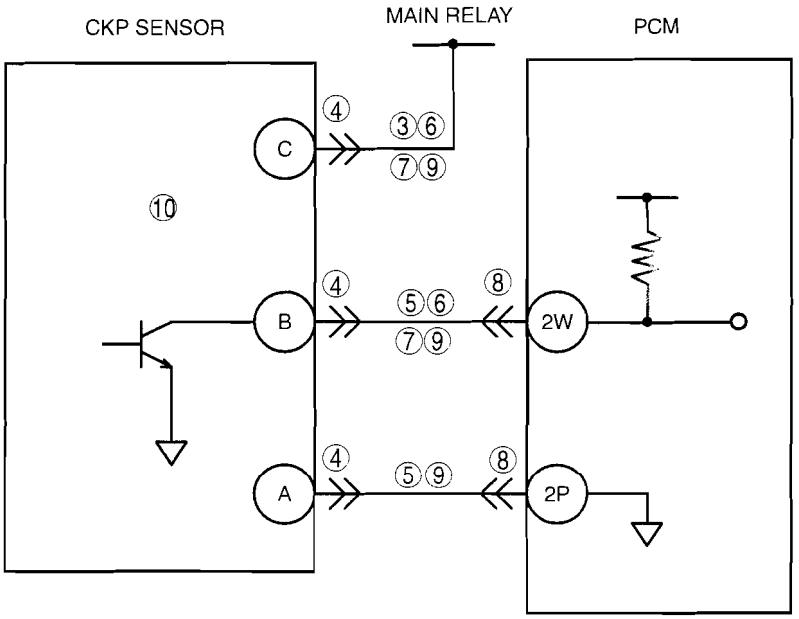
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT KNOCK SENSOR CONNECTOR TERMINAL FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the knock sensor connector. • Inspect for poor connection at terminals A and B (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to step 7.
		No	Go to the next step.
4	**INSPECT KNOCK SENSOR** • Perform the knock sensor inspection. (See01-40B-49 KNOCK SENSOR (KS) INSPECTION[L3 WITH TC]) • Is the knock sensor normal?	Yes	Go to the next step.
		No	Replace the knock sensor, then go to step 7.
5	**INSPECT KNOCK SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between knock sensor terminal A (harness-side) and body ground and knock sensor terminal B (harness-side) and body ground. • Is there any voltage?	Yes	Repair or replace the wiring harness for a short to the power supply, then go to step 7.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED** • Make sure to connect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

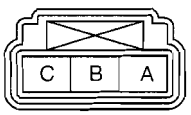
DTC P0335[L3 WITH TC]

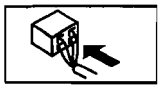
id010239806900

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	• If the PCM does not receive the input voltage from the CKP sensor for **4.2 s** while the MAF is **2.0 g/s {0.26 lb/min.} or above**, the PCM determines that the CKP sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• CKP sensor malfunction • Connector or terminal malfunction • CKP sensor is dirty. • Short to the power supply between CKP sensor terminal A and PCM terminal 2P • Short to the power supply between CKP sensor terminal B and PCM terminal 2W • Short to ground between CKP sensor terminal C and main relay • Short to ground between CKP sensor terminal B and PCM terminal 2W • Open circuit between CKP sensor terminal A and PCM terminal 2P • Open circuit between CKP sensor terminal B and PCM terminal 2W • Open circuit between CKP sensor terminal C and main relay • CKP sensor pulse wheel malfunction • Both CKP sensor wires are shorted to each other • PCM malfunction



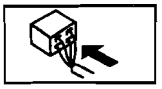
CKP SENSOR
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CKP SENSOR VOLTAGE** • Disconnect the CKP sensor connector. • Connect the voltmeter between the CKP sensor connector terminals B and C (sensor-side). • Inspect the voltage in the AC range while cranking the engine. • Is there any voltage?	Yes	Go to the next step.
		No	Go to step 10.
4	**INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CKP sensor connector is connected securely. • Is connector normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 11.
5	**INSPECT CKP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn ignition switch OFF • Disconnect the CKP sensor connector. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between following terminals (harness-side): — CKP sensor terminal A — CKP sensor terminal B • Is there any voltage?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
6	**INSPECT CKP CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between following terminal and body ground: — CKP sensor connector terminal C (harness-side) — CKP sensor connector terminal B (harness-side) • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
7	**INSPECT CKP CIRCUITS FOR SHORT CIRCUIT** • Inspect for continuity between CKP sensor connector terminals B and C (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 11.
		No	Go to the next step.
9	**INSPECT CKP CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the following circuits: — CKP sensor terminal A (harness-side) and PCM terminal 2P (harness-side) — CKP sensor terminal B (harness-side) and PCM terminal 2W (harness-side) — CKP sensor terminal C (harness-side) and main relay • Are there continuity?	Yes	Go to Step 11.
		No	Repair or replace the suspected wiring harness, then go to Step 11.

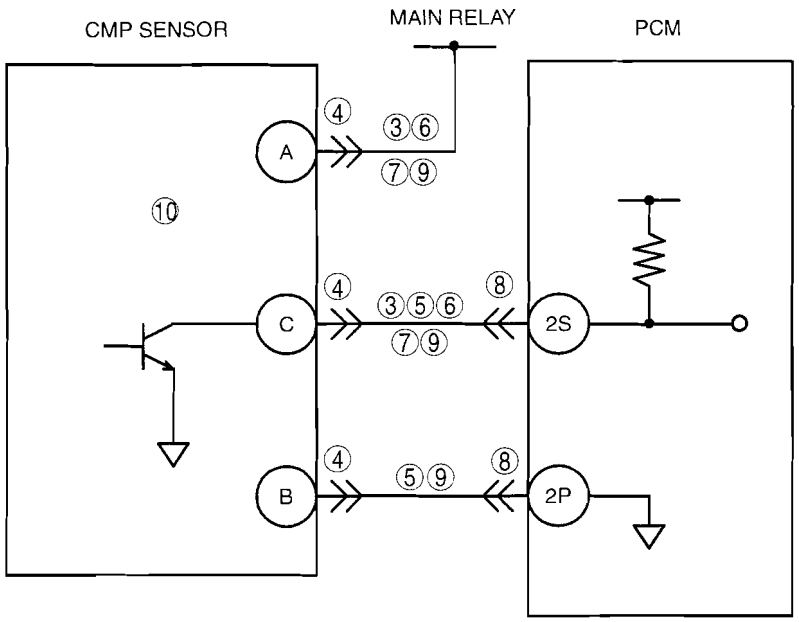
STEP	INSPECTION		ACTION
10	**INSPECT CKP SENSOR** • Turn the ignition switch off. • Perform the CKP sensor inspection. (See01-40B-45 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[L3 WITH TC]) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Inspect the CKP sensor pulse wheel for damage. Replace the CKP sensor pulse wheel and go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Access the MAF PID using the M-MDS. **Note** • The MAF PID should indicate **2.0 g/s {0.26 lb/min.} or above** during this test • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0340[L3 WITH TC]

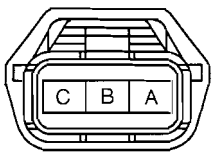
id010239807000

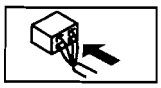
DTC P0340	Camshaft position (CMP) sensor circuit malfunction
DETECTION CONDITION	• PCM monitors the input voltage from the CMP sensor when engine is running. If the PCM does not receive the input voltage from the CMP sensor while the PCM receives the input signal from the CKP sensor, the PCM determines that the CMP circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• CMP sensor malfunction • Connector or terminal malfunction • CMP sensor is dirty • Short to the power circuit between CMP sensor terminal C and PCM terminal 2S • Short to the power circuit between CMP sensor terminal B and PCM terminal 2P • Short to ground circuit between CMP sensor terminal A and main relay • Short to ground circuit between CMP sensor terminal C and PCM terminal 2S • Open circuit between CMP sensor terminal A and main relay • Open circuit between CMP sensor terminal B and PCM terminal 2P • Open circuit between CMP sensor terminal C and PCM terminal 2S • Both CMP sensor wires are shorted to each other • CKP sensor pulse wheel malfunction • CKP sensor misinstallation • Timing chain misinstallation • Loose timing chain or improper valve timing • Loose camshaft sprocket lock bolt • Loose crankshaft pulley lock bolt • PCM malfunction

DTC P0340	Camshaft position (CMP) sensor circuit malfunction

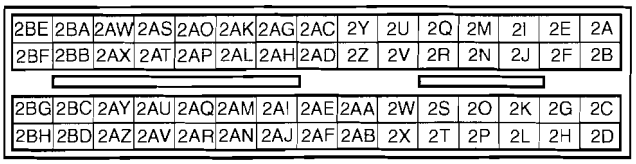


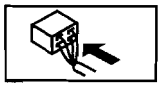
CMP SENSOR
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CMP SENSOR VOLTAGE** • Disconnect the CMP sensor connector. • Connect a voltmeter between CMP sensor connector terminals A and C (sensor-side). • Inspect the voltage in AC range while cranking the engine. • Is there any voltage?	Yes	Go to the next step.
		No	Go to step 10.
4	**INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION** • Verify that the CMP sensor connector is connected securely. • Is the connector normal?	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 15.

STEP	INSPECTION		ACTION
5	**INSPECT CMP CIRCUIT FOR SHORT TO POWER** • Turn ignition switch OFF. • Disconnect the CMP sensor connector. • Turn ignition switch to the ON position (Engine off) • Measure voltage between the following terminals: — CMP sensor connector terminal C (harness-side) and body ground — CMP sensor connector terminal B (harness-side) and body ground • Is the voltage **B+**?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
6	**INSPECT CMP CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between the following terminal and body ground: — CMP sensor connector terminal A (harness-side) — CMP sensor connector terminal C (harness-side) • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
7	**INSPECT CMP CIRCUITS FOR SHORT CIRCUIT** • Inspect for continuity between CMP sensor connector terminals A and C (harness-side). • Is there continuity?	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 15.
		No	Go to the next step.
9	**INSPECT CMP CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the following circuits: — CMP sensor terminal A (harness-side) and main relay — CMP sensor terminal B (harness-side) and PCM terminal 2P (harness-side) — CMP sensor terminal C (harness-side) and PCM terminal 2S (harness-side) • Is there continuity?	Yes	Go to Step 11.
		No	Repair or replace the suspected wiring harness, then go to Step 15.
10	**INSPECT CMP SENSOR** • Turn the ignition switch off. • Perform the CMP sensor inspection. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].) • Is the CMP sensor normal?	Yes	Go to the Step 15.
		No	Replace the CMP sensor and go to Step 15.
11	**VERIFY CMP SENSOR INSTALLATION** • Verify the CKP sensor installation. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Is the CMP sensor installed correctly?	Yes	Go to the next step.
		No	Reinstall the CKP sensor and go to Step 15.
12	**VERIFY VALVE TIMING MECHANISM INSTALLATION** • Verify the valve timing mechanism installation for the following parts: — Timing chain misinstallation — Loose camshaft sprocket lock bolt — Loose crankshaft pulley lock bolt • Is the valve timing mechanism installed correctly?	Yes	Go to the next step.
		No	Reinstall the following parts and go to Step 15. • Timing chain • Camshaft sprocket • Crankshaft pulley

STEP	INSPECTION		ACTION
13	**INSPECT STOPPER PIN MECHANISM** • Remove the timing chain. • Inspect the stopper pin. (See01-10B-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[L3 WITH TC].) • Is the stopper pin mechanism normal?	Yes	Go to the next step.
		No	Replace the variable valve timing actuator, then go to Step 15.
14	**INSPECT ROTOR POSITION** • Remove the variable valve timing actuator. (See01-10B-32 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[L3 WITH TC]) • Is the rotor position at the maximum valve timing retard?	Yes	**VARIABLE VALVE TIMING MECHANISM NORMAL** **Note** • This DTC is detected as an intermittent concern. • The intermittent concern might be removed by cleaning the variable valve timing mode control function. Go to the next step.
		No	Replace the variable valve timing actuator, then go to the next step.
15	**VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Access the MAF PID using the M-MDS. **Note** • The MAF PID should indicate **1.95 g/s {0.25 lb/min.} or above** during this test • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0401[L3 WITH TC]

id010239815300

DTC P0401	EGR flow insufficient detected
DETECTION CONDITION	• PCM monitors the difference in intake manifold pressures when the EGR is operated and when it is stopped. If the difference is too small, the PCM determines that the EGR flow is insufficient. **Diagnostic support note** • This is an intermittent monitor (EGR system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • MAP sensor malfunction • EGR gasket malfunction • Vacuum hose looseness or damage • PCM malfunction

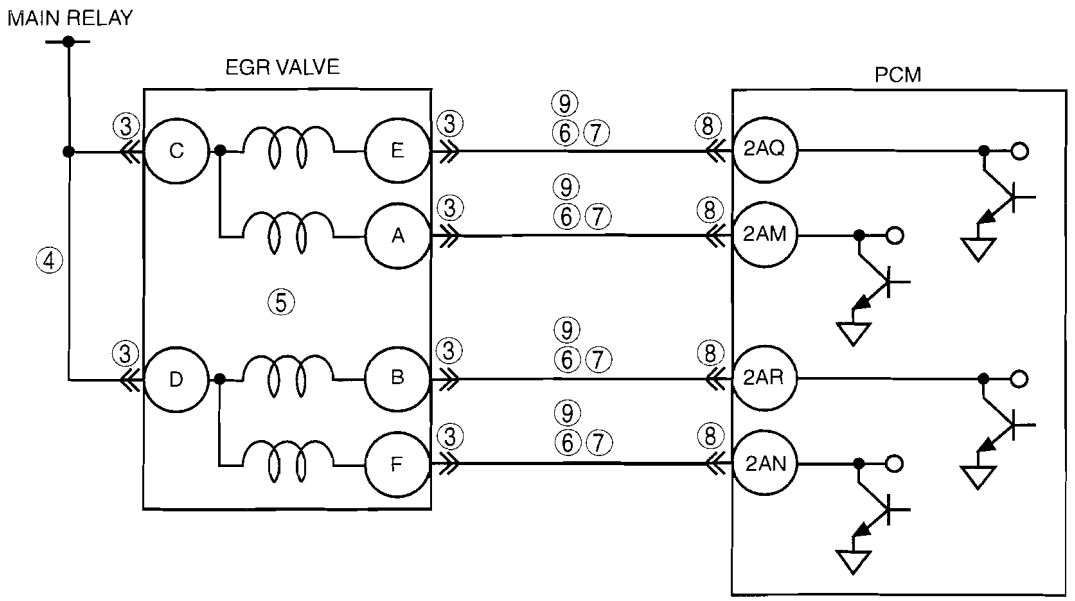
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EGR system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR OTHER DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Have other DTCs been stored?	Yes	Repair the circuit malfunction for applicable DTCs.
		No	Go to the next step.
4	**INSPECT VACUUM HOSE CONDITION** • Inspect freezing vacuum hoses for clogs, damage, frozen, or vacuum leakage. • Is there any malfunction?	Yes	Replace the vacuum hoses, then go to Step 8.
		No	Go to the next step.
5	**INSPECT EGR VALVE MALFUNCTION** • Inspect the EGR valve. (See01-16B-13 EGR VALVE INSPECTION[L3 WITH TC].) • Is the EGR valve normal?	Yes	Go to the next step.
		No	Replace the EGR valve, then go to Step 8.
6	**INSPECT MAP SENSOR MALFUNCTION** • Perform the MAP sensor inspection. (See01-40B-32 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[L3 WITH TC].) • Is the EGR valve normal?	Yes	Go to the next step.
		No	Replace the MAP sensor, then go to Step 8.
7	**INSPECT EGR VALVE PASSAGE** • Turn the ignition switch off. • Remove the EGR valve. • Is the gasket installation normal?	Yes	Go to the next step.
		No	Install the gasket correctly, then go to the next step.
8	**MONITOR EGR SYSTEM BY DRIVE MODE** • Clear the DTC from the PCM memory using the M-MDS. • Run the PCM Adaptive Memory Procedure Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Stop the vehicle and access the ON BOARD READINESS TEST to inspect the DRIVE MODE completion status. • Verify the FUEL_EVAL and EGR_EVAL PIDs status. • Do the FUEL_EVAL and EGR_EVAL PIDs change to Yes?	Yes	Go to the next step.
		No	Retry this step.
9	**VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Access the DIAGNOSTIC MONITORING TEST RESULTS. (See01-02B-7 ON-BOARD DIAGNOSTIC TEST[L3 WITH TC].) • Verify the TEST #10: 31: 83 (EGR pressure variation) value. • Is the value within the specification?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

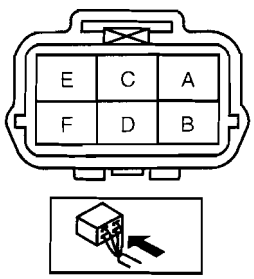
DTC P0403[L3 WITH TC]

id010239807100

DTC P0403	EGR valve (stepper motor) circuit malfunction
DETECTION CONDITION	• PCM monitors the input voltage from the EGR valve. If the voltage remain low or high, the PCM determines that the EGR valve circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is not available. • DTCs are not stored in the PCM memory.
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to the power supply in the wiring harness between EGR valve terminal E and PCM terminal 2AQ • Short to the power supply in the wiring harness between EGR valve terminal A and PCM terminal 2AM • Short to the power supply in the wiring harness between EGR valve terminal B and PCM terminal 2AR • Short to the power supply in the wiring harness between EGR valve terminal F and PCM terminal 2AN • Short to ground circuit in wiring harness between EGR valve terminal E and PCM terminal 2AQ • Short to ground circuit in wiring harness between EGR valve terminal A and PCM terminal 2AM • Short to ground circuit in wiring harness between EGR valve terminal B and PCM terminal 2AR • Short to ground circuit in wiring harness between EGR valve terminal F and PCM terminal 2AN • Open circuit in the wiring harness between EGR valve terminal E and PCM terminal 2AQ • Open circuit in the wiring harness between EGR valve terminal A and PCM terminal 2AM • Open circuit in the wiring harness between EGR valve terminal B and PCM terminal 2AR • Open circuit in the wiring harness between EGR valve terminal F and PCM terminal 2AN • Open circuit in the wiring harness between main relay and EGR valve terminal C • Open circuit in the wiring harness between main relay and EGR valve terminal D • PCM malfunction



EGR VALVE
WIRING HARNESS SIDE CONNECTOR



PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT EGR VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the EGR valve connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminals and/or connector, then go to Step 10.
		No	Go to the next step.
4	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Measure the voltage following the terminal and body ground. — EGR valve terminal C (harness-side) — EGR valve terminal D (harness-side) • Is voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit then go to Step 10.
5	**INSPECT EGR VALVE** • Perform the EGR valve inspection. (See01-16B-13 EGR VALVE INSPECTION[L3 WITH TC].) • Is the EGR valve normal?	Yes	Go to the next step.
		No	Replace the EGR valve, then go to Step 10.
6	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — EGR valve terminal E (harness-side) — EGR valve terminal A (harness-side) — EGR valve terminal B (harness-side) — EGR valve terminal F (harness-side) • is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT FOR CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground: — EGR valve terminal E (harness-side) — EGR valve terminal A (harness-side) — EGR valve terminal B (harness-side) — EGR valve terminal F (harness-side) • Is voltage **B+**?	Yes	Repair or replace wiring harness for a short to power supply, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminals and/or connector, then go to Step 10.
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Remove the PCM with PCM connector connected. • Inspect for continuity between the following terminals (harness-side): — Between EGR valve terminal E and PCM terminal 2AQ — Between EGR valve terminal A and PCM terminal 2AM — Between EGR valve terminal B and PCM terminal 2AR — Between EGR valve terminal F and PCM terminal 2AN • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0421[L3 WITH TC]

id010239807300

DTC P0421	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	• The PCM compares the number of front HO2S and rear HO2S inversions for a predetermined time. The PCM monitors the rear HO2S inversion ratio when the following conditions are met: The PCM detects inversion ratio. If the inversion ratio is below threshold, the PCM determine that catalyst system has deteriorated. — The front HO2S inversion ratio is as prescribed when the following monitoring conditions are met: — The accumulated occurrence time of the following monitoring conditions has exceeded the prescribed time limit: **MONITORING CONDITIONS** — Engine speed:**1,500—3,250 rpm** — Calculated TWC temperature: **above 400 °C {752 °F}** — LOAD:**15—48%** (at engine speed of **2,000 rpm**) **Diagnostic support note** • This is an intermittent monitor (Catalyst). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • DIAGNOSTIC MONITORING TEST RESULTS is available. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TWC deterioration or malfunction • Exhaust gas leakage • Loose front HO2S • Loose rear HO2S • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Catalyst related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE** • Visually inspect for exhaust gas leakage in the exhaust system. • Is there exhaust gas leakage?	Yes	Repair or replace the malfunctioning part, then go to Step 7.
		No	Go to the next step.
5	**INSPECT INSTALLATION OF FRONT AND REAR HO2S** • Inspect the front and rear HO2S for looseness. • Is it normal?	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 7. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
6	**INSPECT TWC** • Clear the DTC using the M-MDS generic OBD function. • Turn the ignition switch off then back to the ON position. • Inspect the TWC. (See01-16B-15 WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Replace the heated oxygen sensor, then go to the next step.
		No	Replace the TWC, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P0421 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0441[L3 WITH TC]

id010239041100

DTC P0441	Evaporative emission control system incorrect purge flow
DETECTION CONDITION	• PCM measures the purge line pressure under the following conditions. If the vacuum between the charcoal canister and the intake manifold does not reach the specification, PCM determines that the EVAP system is clogged. **MONITORING CONDITION** — Engine speed: **1,500—3,500 rpm** — Vehicle speed: **53—136 km/h {32.9—84.5 mph}** — Throttle opening angle: **90% or less** — Difference between barometric pressure and manifold absolute pressure: **6.67 kPa or more** **Diagnostic support note** • This is an intermittent monitor (Evaporative emission system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Evaporative emission system leak detection pump malfunction • Charcoal canister malfunction • EVAP hose damaged or loose • EVAP pipe damaged • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Evaporative emission system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Is DTC P0443 present?	Yes	Go to the appropriate DTC inspection.
		No	Go to the next step.
4	**DETERMINE IF LEAK CONCERN OR BLOCKAGE CONCERN** • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the system inspection fail?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT IF PURGE SOLENOID VALVE STUCK CLOSED** • Inspect if the purge solenoid valve is stuck closed. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the purge solenoid valve normal?	Yes	Inspect the following parts for clogging. • Vacuum hoses between the intake manifold to the charcoal canister • Catch tank • Charcoal canister Repair or replace the part, then go to Step 11.
		No	Replace the purge solenoid valve, then go to Step 11.

STEP	INSPECTION		ACTION
6	**LOCATE LEAK POINT** • Inspect the following for leakage using the ultrasonic leak detector. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair leakage or replace the part, then go to Step 10.
		No	Go to the next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place a clamp on the EVAP system leak detection pump hose between the EVAP system leak detection pump and air filter. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail (red light turns on)?	Yes	Go to Step 9.
		No	Go to the next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove the clamp. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail (red light turns on)?	Yes	Replace the EVAP system leak detection pump, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or a poorly installed pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to the next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail (red light turns on)?	Yes	Leakage still exists. Locate leak the point and repair. Then go to the next step.
		No	Go to the next step
11	**VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED** • Start the engine and let it idle. • Clear the DTC using the M-MDS. • Turn the ignition switch off. • Perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC]) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0442[L3 WITH TC]

id010239807500

DTC P0442	Evaporative emission control system leak detected (small leak)
DETECTION CONDITION	• PCM measures the pump load current (EVAP line pressure) when the specified period has passed after the EVAP system is sealed when the monitoring conditions are met. If the load does not reach the reference current value within the specified period, the PCM determines that the EVAP system has a small leak. **MONITORING CONDITION** — The ignition switch is turned off. — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or more** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** — Time after engine off: **5 hour 10 min** **Diagnostic support note** • This is an intermittent monitor (Evaporative emission system). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Fuel filler cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Evaporative emission system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC inspection.
		No	Go to the next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Go to the next step.
		No	Intermittent concern exists. Inspect the purge solenoid valve and the EVAP system leak detection pump circuit for an intermittent concern. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
5	**LOCATE LEAK POINT** • Inspect for leakage for the following using the Evaporative Emissions Tester. — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair the leakage or replace the part, then go to Step 10.
		No	Go to the next step.

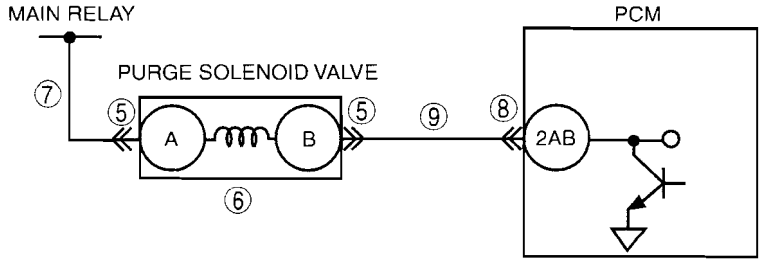
STEP	INSPECTION		ACTION
6	**INSPECT PURGE SOLENOID VALVE** • Inspect purge solenoid valve is stuck closed. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place the clamp on the EVAP system leak detection pump hose between the EVAP system leak detection pump and the air filter. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Go to Step 9.
		No	Go to the next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove the clamp. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result failed?	Yes	Replace the EVAP system leak detection pump, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or a poorly installed pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to the next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result failed?	Yes	Leakage still exists. Locate the leak point and repair. Then go to the next step.
		No	Go to the next step
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0443[L3 WITH TC]

id010239807600

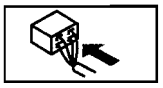
DTC P0443	EVAP control system purge control valve circuit malfunction
DETECTION CONDITION	• PCM monitors the input voltages from the purge solenoid valve. If the voltage remains low or high, the PCM determines that the purge solenoid valve circuit has a malfunction. **Diagnostic support note** • This is an continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • Connector or terminal malfunction • Short to ground in the wiring harness between purge solenoid valve terminal B and PCM terminal 2AB • Open circuit in the wiring harness between the main relay and purge solenoid valve terminal A • Open circuit in the wiring harness between purge solenoid valve terminal B and PCM terminal 2AB • Short to the power supply between purge solenoid valve terminal B and PCM terminal 2AB • PCM malfunction

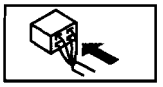
DTC P0443	EVAP control system purge control valve circuit malfunction



PURGE SOLENOID VALVE WIRING HARNESS SIDE CONNECTOR

PCM WIRING HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION** • Disconnect the purge solenoid valve tube that is connected to the intake manifold. • Connect the vacuum pump to the purge solenoid valve. • Pump the vacuum pump several times and stop. • Wait **a few seconds.** • Is the vacuum maintained?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE** • Turn the ignition switch off. • Disconnect the purge solenoid valve connector. • Pump the vacuum pump several times and wait **a few seconds.** • Is the vacuum maintained?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 10.
		No	Replace the purge solenoid valve, then go to Step 10.
5	**INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	**INSPECT PURGE SOLENOID VALVE** • Perform the purge solenoid valve inspection. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 10.

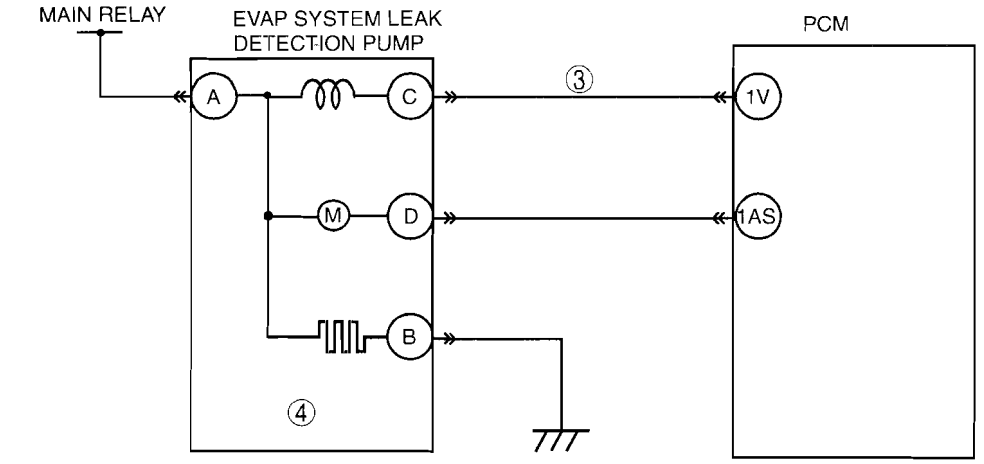
STEP	INSPECTION		ACTION
7	**INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between purge solenoid valve connector terminal A and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 10.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Measure voltage between purge solenoid valve terminal B (harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to the next step.
		No	Inspect for continuity between purge solenoid valve terminal B (harness-side) and PCM terminal 2AB (harness-side). • If there is continuity, go to the next step. • If there is no continuity, repair or replace the wiring harness for an open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0446[L3 WITH TC]

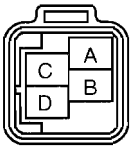
id010239807700

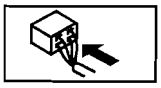
DTC P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the EVAP leak monitor is operating. When the decrease in the pump load current is less than the specification after the reference current value has been obtained, the PCM determines that the change over-valve (COV) in the EVAP system leak detection pump has a malfunction. **Diagnostic support note** • This is an intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• COV (in EVAP system leak detection pump.) malfunction • Short to the power circuit between the EVAP system leak detection pump terminal C and PCM terminal 1V • PCM malfunction

DTC P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close



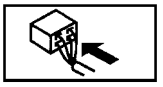
EVAP SYSTEM LEAK DETECTION PUMP WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK COV CONTROL (EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER)** • Turn ignition switch to the ON position (engine OFF). • Disconnect the EVAP system leak detection pump connector. • Measure the voltage between EVAP system leak detection pump connector terminal C (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness, then go to Step 5.
		No	Go to the next step.
4	**INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)** • Inspect the EVAP system leak detection pump. (See01-16B-8 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC].) • Is the COV (EVAP system leak detection pump) normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If the EVAP system test function is not available, preform the following procedure: — Perform "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC]) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0455[L3 WITH TC]

id010239815500

DTC P0455	Evaporative emission control system leak detected (gross leak)
DETECTION CONDITION	• PCM measures the pump load current (EVAP line pressure) when a specified period has passed after the EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference current value within the specified period, the PCM determines that the EVAP system has a gross leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or more** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** — Time after engine off: **5 hour 10 min** **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Loose, missing or detective fuel filler cap • Charcoal canister malfunction • Fuel tank malfunction • Fuel tank misinstallation • EVAP hose damaged or loose • Poor connection or damaged vacuum hose

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Evaporative emission system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then to the ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Are DTCs P0443 and/or P0446 present?	Yes	Go to the appropriate DTC troubleshooting procedure.
		No	Go to the next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does test result fail?	Yes	Go to the next step.
		No	Intermittent concern exists. Inspect the purge solenoid valve and the EVAP system leak detection pump circuit for an intermittent concern. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
5	**INSPECT FUEL FILLER CAP** • Verify that the fuel-filler cap is neither disconnected nor loose or damaged. • Is it normal? **Note** • When a fuel-filler cap other than an OEM cap is attached, it is considered a malfunction.	Yes	Go to the next step.
		No	Retighten the fuel-filler cap or replace it if it is damaged. Go to Step 17.
6	**INSPECT IF PURGE SOLENOID VALVE IS STUCK** • Inspect the purge solenoid valve. • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 17.
7	**INSPECT COV (EVAP SYTEM LEAK DETECTION PUMP)** • Inspect the EVAP system leak detection pump. • Is the COV (EVAP leak detection pump) normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to Step 17.
8	**DETERMINE IF EVAP CONTROL SYSTEM FOR LEAKAGE OR BLOCKAGE** **Note** • If the evaporative emission tester is not available, then go to the next step. • Perform the Evaporative System Leak Inspection. • Does the system test fail?	Yes	Repair or replace malfunctioning area, then go to Step 17.
		No	Go to the next step.
9	**INSPECT LEAKAGE OF CHARCOAL CANISTER TO FUEL PUMP** • Disconnect the fuel tank side vacuum hose at the charcoal canister. • Apply vacuum **1.7 KPa {13 mmHg, 0.5 inHg}** to the disconnected vacuum hose using a vacuum pump. • Does the vacuum hold for a minimum of **2 min**?	Yes	Go to the Step 13.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify the vacuum hose installation condition between the fuel tank and the charcoal canister. • Is a poor connection detected?	Yes	Connect the vacuum hose correctly, then go to Step 17.
		No	Go to the next step.
11	**INSPECT FUEL TANK INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or poorly installed fuel pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to Step 17.
12	**INSPECT FUEL TANK** • Inspect the fuel tank. • Is it normal?	Yes	Replace the vacuum hose from the charcoal canister to the fuel tank, then go to the next step.
		No	Replace the fuel tank, then go to the next step.
13	**INSPECT LEAKAGE FROM CHARCOAL CANISTER TO PURGE SOLENOID VALVE** • Disconnect the purge solenoid valve side vacuum hose at the charcoal canister. • Apply vacuum **3.3 KPa {25 mmHg, 1.0 inHg}** to the disconnected vacuum hose using a vacuum pump. • Does the vacuum hold for a minimum of **2 min**?	Yes	Go to the Step 17.
		No	Go to the next step.
14	**VERIFY POOR CONNECTION OF VACUUM HOSE** • Verify the vacuum hose installation condition between the purge solenoid valve and the charcoal canister. • Is a poor connection detected?	Yes	Connect the vacuum hose correctly, then go to Step 17.
		No	Go to the next step.
15	**INSPECT PURGE SOLENOID VALVE FOR DAMAGE OR AIR LEAKAGE** • Remove the purge solenoid valve and inspect for damage and air leakage. • Is it normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 17.
16	**INSPECT CHARCOAL CANISTER** • Remove the charcoal canister and inspect for clogging, damage and pinholes. • Is it normal?	Yes	Replace the vacuum hose from the charcoal canister to the purge solenoid valve, then go to the next step.
		No	Replace the charcoal canister, then go to the next step.
17	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Leakage still exists. Locate the leak point and repair. Then go to the next step.
		No	Go to the next step
18	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0456[L3 WITH TC]

id010239807900

DTC P0456	Evaporative emission control system leak detected (very small leak)
DETECTION CONDITION	• PCM measures the pump load current (EVAP line pressure) when a specified period has passed after the EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference load value or the rate of the load increase is lower than the specification within a specified period, the PCM determines that the EVAP system has a very small leak. **MONITORING CONDITION** — IG switch OFF — IAT: **5—35 °C {40—95 °F}** — Battery voltage: **11 V or more** — Atmospheric pressure: **72.2 kPa {542 mmHg, 21.3 inHg} or above** — Fuel tank level: **15—85%** — Time after engine off: **5 hour 10 min** **Diagnostic support note** • This is an intermittent monitor (Evaporative system monitor). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory. • DIAGNOSTIC MONITORING TEST RESULT is available.
POSSIBLE CAUSE	• Purge solenoid valve malfunction • EVAP system leak detection pump malfunction • Charcoal canister malfunction • Fuel cap malfunction • Fuel tank malfunction • Fuel pump unit poor seal • EVAP hose damaged or loose • EVAP pipe damaged

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Evaporative emission system related) been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch off then ON position (Engine off). • Verify related PENDING CODE or stored DTCs. • Are other DTC present?	Yes	Go to the appropriate DTC inspection.
		No	Go to the next step.
4	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the system test result fail?	Yes	Go to the next step.
		No	Intermittent concern exists. Inspect the purge solenoid valve and the EVAP system leak detection pump circuit for an intermittent concern. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)

STEP	INSPECTION		ACTION
5	**LOCATE LEAK POINT** • Check for leakage for the following using the Evaporative Emission Tester — Charcoal canister — Catch tank — Fuel filler cap — EVAP hoses and pipes — Fuel tank • Is leakage found?	Yes	Repair the leakage or replace the part, then go to Step 10.
		No	Go to the next step.
6	**INSPECT PURGE SOLENOID VALVE** • Inspect if the purge solenoid valve is stuck closed. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 10.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Connect all disconnected connectors and hoses. • Place a clamp on the EVAP system leak detection pump hose between the EVAP system leak detection pump and the air filter. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Go to Step 9.
		No	Go to the next step.
8	**CONFIRM EVAP SYSTEM LEAK DETECTION PUMP LEAKAGE** • Remove the clamp. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Replace the EVAP system leak detection pump, then go to Step 10.
		No	Go to the next step.
9	**INSPECT FUEL PUMP UNIT INSTALLATION** • Remove the fuel tank. • Visually inspect for damage, insufficient sealing or a poorly installed pump unit. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to the next step.
10	**PERFORM LEAK INSPECTION** • Connect all disconnected connectors and hoses. • Perform the evaporative system leak inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the test result fail?	Yes	Leakage still exists. Locate the leak point and repair. Then go to the next step.
		No	Go to next step
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0461[L3 WITH TC]

id010239808000

DTC P0461	Fuel gauge sender unit circuit range/performance
DETECTION CONDITION	• PCM monitors the fuel level voltage difference before and after the PCM-calculated fuel consumption has reached **25 L {26.4 US qt., 22 Imp qt.}**. If the difference is **5%** less than the PCM-calculated fuel consumption, the PCM determines that the fuel gauge sender unit range/performance is in error. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction or substandard performance • Instrument cluster malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn the ignition switch off. • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is the fuel gauge sender unit normal?	Yes	Replace the PCM, then go to the next step.
		No	Repair or replace the fuel gauge sender unit, then go to the next step.
4	**INSPECT INSTRUMENT CLUSTER** • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the suspected malfunction, then go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0462[L3 WITH TC]

id010239808100

DTC P0462	Fuel gauge sender unit circuit low input
DETECTION CONDITION	• The PCM monitors the signals of the fuel level and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects that the fuel level or fuel gauge sender unit output voltage is too low, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Instrument cluster malfunction • Fuel gauge sender unit malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn the ignition switch off. • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is the fuel gauge sender unit normal?	Yes	Replace the PCM, then go to the next step.
		No	Repair or replace the fuel gauge sender unit, then go to the next step.
4	**INSPECT INSTRUMENT CLUSTER** • Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the suspected malfunction, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0463[L3 WITH TC]

id010239808200

DTC P0463	Fuel gauge sender unit circuit high input
DETECTION CONDITION	• The PCM monitors the signals of the fuel level and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects that the fuel level or fuel gauge sender unit output voltage is too high, the PCM determines that the fuel gauge sender unit circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Instrument cluster malfunction • Fuel gauge sender unit malfunction • PCM malfunction

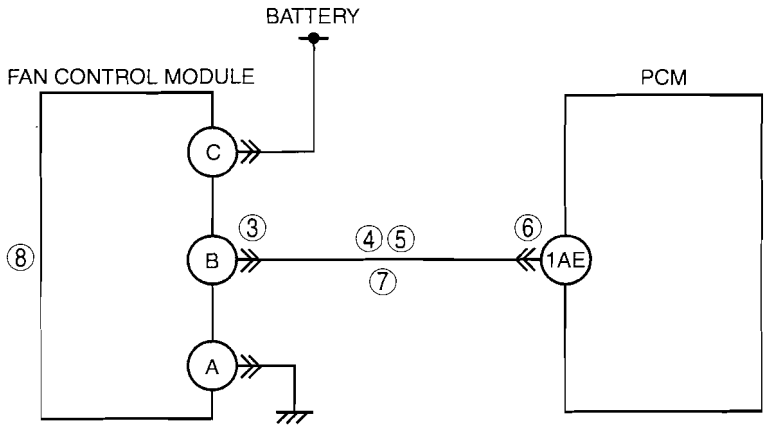
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUEL GAUGE SENDER UNIT** • Turn the ignition switch off. • Inspect the fuel gauge sender unit. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is the fuel gauge sender unit normal?	Yes	Replace the PCM, then go to the next step.
		No	Repair or replace the fuel gauge sender unit, then go to the next step.
4	**INSPECT INSTRUMENT CLUSTER** • Perform "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE" procedure. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is there any malfunction?	Yes	Repair or replace the suspected malfunction, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

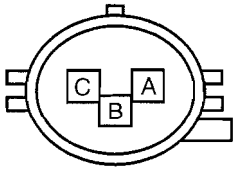
DTC P0480[L3 WITH TC]

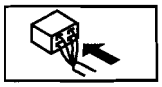
id010239807400

DTC P0480	Fan control circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the fan control module No.1. If the voltage remains low or high, the PCM determines that the fan control circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Fan control module No.1 malfunction • Connector or terminal malfunction • Short to the power supply in the wiring harness between fan control module No.1 terminal 1B and PCM terminal 1AE • Short to ground in the wiring harness between fan control module No.1 terminal 1B and PCM terminal 1AE • Open circuit in the wiring harness between fan control module No.1 terminal 1B and PCM terminal 1AE • PCM malfunction



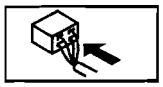
FAN CONTROL MODULE
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FAN CONTROL MODULE No.1 CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the fan control module No.1 connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT FAN CONTROL MODULE No.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between fan control module No.1 terminal 1B (wiring harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 9.
		No	Go to the next step.
5	**INSPECT FAN CONTROL MODULE No.1 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between fan control module No.1 terminal 1B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 9.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT FAN CONTROL module No.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between fan control module No.1 terminal 1B (wiring harness-side) and PCM terminal 1AE. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
8	**INSPECT FAN CONTROL module No.1** • Perform the fan control module No.1 inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the fan control module No.1 normal?	Yes	Go to the next step.
		No	Replace the fan control module No.1, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED** • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Turn A/C switch to ON. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0500[L3 WITH TC]

id010239808400

DTC P0500	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Wheel speed signal from the DSC HU/CM is **below 3.7 km/h {2.3 mph}** when the following conditions are met: — Neutral switch and CPP switch are off — Load is above **40%** — Engine speed is **2,000 rpm or above** — Brake switch is OFF **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Front ABS wheel-speed sensor malfunction • DSC malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME PID DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME PID DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY STORED DTC IN DSC HU/CM** • Turn the ignition switch to the ON position (Engine off). • Verify stored DTCs in the DSC HU/CM. (See04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are DTCs stored?	Yes	Go to the appropriate DTC inspection. (See04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Warm up the engine. • Access the RPM and LOAD PID using the M-MDS. • Drive the vehicle under the following conditions for **18s.** — Engine speed: **2,000 rpm or above** — Gear: Gear is in other than NEUTRAL — Load: **40% or above** • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0505[L3 WITH TC]

id010239808500

DTC P0505	IAC system problem
DETECTION CONDITION	• The PCM cannot control idle speed toward the target idle speed during the KOER self test.
POSSIBLE CAUSE	• Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator control circuit malfunction • Low engine compression (Over capacity of blow-by gas) • Electronic throttle control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**VERIFY RELATED PENDING OR STORED DTCs** • Turn the ignition switch off then to the ON position.(Engine off) • Verify pending code or stored DTCs using the M-MDS. • Are DTCs P0506, P0507, P0638, P2100, P2101, P2102, P2103, P2108, P2119 present?	Yes	Perform the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
3	**VERIFY ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION** • Perform the TP sweep inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the electronic throttle control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection result. Then go to Step 9.
4	**INSPECT A/C MAGNETIC CLUTCH OPERATION** **Note** • The following test should be performed for vehicles with A/C. Go to the next step for vehicles without A/C • Turn the fan switch off. • Is the magnetic clutch still on?	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY." of ENGINE SYMPTOM TROUBLESHOOTING then go to Step 9. (See01-03B-5 ENGINE SYMPTOM TROUBLESHOOTING[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION** • Apply electrical load. • Does the engine speed increase?	Yes	Go to the next step.
		No	Repair for a short to the power supply in the generator control circuit, then go to Step 9.
6	**INSPECT AIR CLEANER ELEMENT** • Remove the air cleaner element with the engine running. • Does the engine speed increase?	Yes	Clean or replace the air cleaner element, then go to Step 9.
		No	Go to the next step.
7	**INSPECT THROTTLE BODY PASSAGE** • Is the throttle body clogged?	Yes	Clean or replace the throttle body passage, then go to Step 9.
		No	Go to the next step.
8	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is the engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC using the M-MDS. • Perform the KOER Self-Test. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0506[L3 WITH TC]

id010239808600

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **14 s** when the brake pedal is depressed (brake switch is on) and the steering wheel is held straight ahead (power steering pressure switch is off). **Note** • If the atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or the intake air temperature is **below –10 °C {14 °F}**, the PCM cancels the diagnosis of P0506. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Air cleaner element clogged • Air intake passage clogged • A/C relay control circuit malfunction • Generator malfunction • Purge solenoid valve malfunction • Low engine compression (Over capacity of blow-by gas) • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition switch to OFF, then ON (Engine off). • Verify pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Repair the applicable DTCs. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT A/C MAGNET CLUTCH OPERATION** • Turn the blower motor switch off. • Is the magnet clutch still on?	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 11. (See01-03B-70 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT ELECTRONIC THROTTLE CONTROL SYSTEM MALFUNCTION** • Inspect the following parts: — APP sensor (See01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) — TP sensor (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) • Are they normal?	Yes	Go to the next step.
		No	Replace the necessary parts, then go to Step 11.
6	**INSPECT PURGE SOLENOID VALVE MALFUNCTION** • Perform the purge solenoid valve inspection. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the purge solenoid valve normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 11.
7	**INSPECT AIR CLEANER ELEMENT** • Remove the air cleaner element with the engine running. • Does the engine speed increase?	Yes	Replace the air cleaner element, then go to Step 11.
		No	Go to the next step.
8	**INSPECT THROTTLE BODY PASSAGE** • Is the throttle body clogged?	Yes	Clean or replace the throttle body passage, then go to Step 11.
		No	Go to the next step.
9	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is the engine compression normal?	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 11.
10	**INSPECT GENERATOR** • Perform the generator inspection. (See01-17B-7 GENERATOR INSPECTION[L3 WITH TC].) • Is the generator normal?	Yes	Go to the next step.
		No	Repair or replace the related part, then go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Depress the brake pedal for **14 s or more.** • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0507[L3 WITH TC]

id0102398087OO

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	• Actual idle speed is higher than expected by **200 rpm** for **14 s** when the brake pedal is depressed (brake switch is on) and steering wheel is held straight ahead (power steering pressure switch is off). **Note** • If the atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or the intake air temperature is **below –10 °C {14 °F}**, the PCM cancels diagnosis of P0507. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Vacuum hose misconnection • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING OR STORED DTCS** • Turn ignition switch to off, then ON position (Engine off). • Verify pending code or stored DTCs using the M-MDS. • Are other DTCs present?	Yes	Repair applicable DTCs. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT VACUUM HOSE CONNECTION** • Are the vacuum hoses connecting accurately? (See01-13B-4 VACUUM HOSE ROUTING DIAGRAM[L3 WITH TC].)	Yes	Go to the next step.
		No	Reconnect the vacuum hoses correctly, then go to step 6.
5	**INSPECT ELECTRONIC THROTTLE CONTROL SYSTEM MALFUNCTION** • Inspect the following parts: — APP sensor (See01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) — TP sensor (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) • Are they normal?	Yes	Go to the next step.
		No	Replace the necessary parts, then go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Depress the brake pedal for **14 s or more.** • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P050A[L3 WITH TC]

id010239800000

DTC P050A	Cold start idle air control system performance
DETECTION CONDITION	• Actual idle speed is lower than expected by **100 rpm** for **8.4 s** when the target idle speed correction value for cold start is **above 0 rpm** or ignition retard value is **above 8.5 deg.CA**. **Note** • If atmospheric pressure is **less than 72.3 kPa {542 mmHg, 21.3 inHg}** or intake air temperature is **below -10 °C {14 °F}**, the PCM cancels diagnosis of P050A. **Diagnostic support note** • This is an intermittent monitor (Cold start emission reduction strategy monitoring). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Electronic throttle control system malfunction • Throttle valve stuck or blockage • Air suction in intake air system • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and diagnostic monitoring test results on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is P050A on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
4	**CHECK AIR SUCTION IN INTAKE AIR SYSTEM** • Start the engine. • Check air suction between MAF sensor and intake manifold. • Is there any air suction in the intake air system?	Yes	Repair or replace malfunctioning part, then go to Step 7.
		No	Go to the next step.
5	**VERIFY ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION** • Perform the Electronic Throttle Control System Operation Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC], Electronic Throttle Control System Inspection.) • Does the electronic throttle control system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result. Then go to Step 7.
6	**VERIFY THROTTLE VALVE** • Turn the ignition switch off. • Remove the throttle valve with connector connected. • Access ETC_DSD PID using the M-MDS. • Turn the ignition switch to ON position (Engine off). • Move the throttle valve using the ETC_DSD PID simulation function. • Dose the throttle valve move smoothly?	Yes	Go to the next step.
		No	Clean the throttle valve and retest. If the problem does not resolve, replace the throttle body. Then go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P050A COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from the PCM memory using the M-MDS. • Perform the KOER self-test using the M-MDS. (See01-02B-14 DTC TABLE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTC present?	Yes	Go to the applicable DTC troubleshooting.(See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.

DTC P050B[L3 WITH TC]

id010239799900

DTC P050B	Cold start ignition timing performance
DETECTION CONDITION	• The PCM monitors actual ignition timing while electronic spark advance control fast idle correction operating. If the ignition timing is out of specified range, the PCM determines that the ignition timing at cold condition has performance problem. **Diagnostic support note** • This is an intermittent monitor (Cold start emission reduction strategy monitoring). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Electronic throttle control sys malfunction • Throttle valve stuck or blocka • Air suction in intake air system • PCM malfunction

Diagnostic procedure

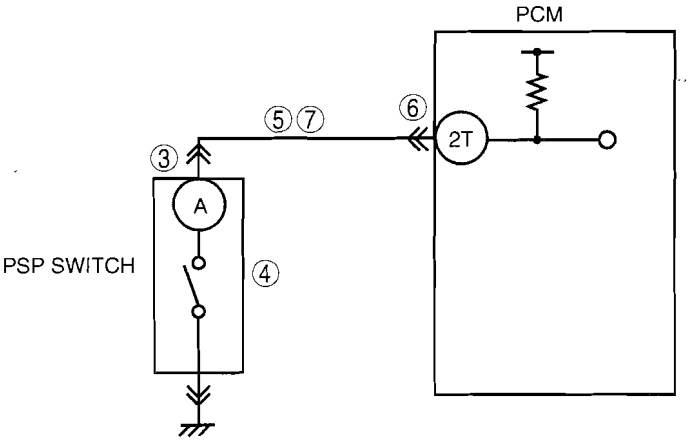
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and diagnostic monitoring test results on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is P050B on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
4	**VISUALLY INSPECT CKP SENSOR AND PULSE WHEEL** • Visually inspect for CKP sensor and pulse wheel. • Is there any damage or chip on CKP sensor and pulse wheel?	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
5	**INSPECT CKP SENSOR** • Inspect CKP sensor. (See01-40B-45 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[L3 WITH TC].) • Is the CKP sensor normal?	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 8.

STEP	INSPECTION		ACTION
6	**VISUALLY INSPECT CMP SENSOR AND PULSE WHEEL** • Visually inspect for CMP sensor and pulse wheel. • Is there any damage or chip on CMP sensor and pulse wheel?	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
7	**INSPECT CMP SENSOR** • Inspect CMP sensor. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].) • Is the CMP sensor normal?	Yes	Go to the next step.
		No	Replace the CMP sensor, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P050B COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from the PCM memory using the M-MDS. • Perform the KOER self-test using the M-MDS. (See01-02B-14 DTC TABLE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTC present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0550[L3 WITH TC]

id010239808800

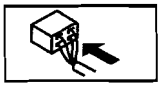
DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the PSP switch signal, If the input voltage is low voltage (switch stays on) for **1 min.** when the VSS is **above 60.0 km/h {37.4 mph}** and the ECT is **above 60 °C {140 °F}**, the PCM determines that the PSP switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• PSP switch malfunction • Connector or terminal malfunction • Short to ground in the wiring harness between the PSP switch terminal and PCM terminal 2T • Open circuit in the wiring harness between the PSP switch terminal and PCM terminal 2T • PCM malfunction



PSP SWITCH
WIRING HARNESS SIDE CONNECTOR

PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



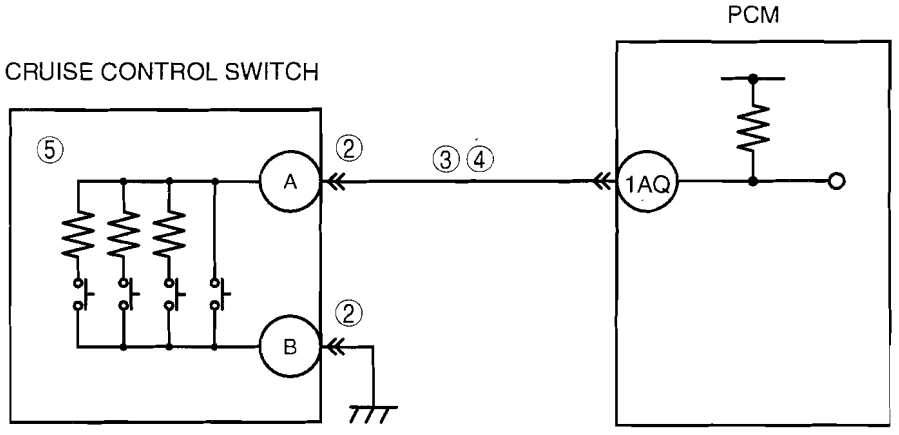
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT PSP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PSP connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT PSP SWITCH** • Perform the PSP switch inspection. (See01-40B-24 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION[L3 WITH TC].) • Is the PSP switch normal?	Yes	Go to the next step.
		No	Replace the PSP switch, then go to Step 8.
5	**INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect the PCM connector. • Inspect for continuity between the PSP switch terminal (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 8.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn ignition switch to OFF • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT SIGNAL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Inspect for continuity between PSP terminal A (harness-side) and PCM terminal 2T (harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle **above 60 km/h {37.3 mph}** for**1 min.** • Verify that the ECT PID is **above 60 °C {140 °F}** using the M-MDS. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

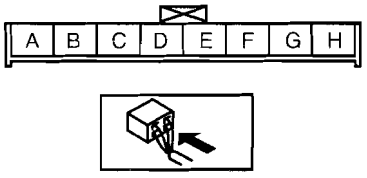
DTC P0564[L3 WITH TC]

id010239808900

DTC P0564	Cruise control switch circuit malfunction
DETECTION CONDITION	• The PCM monitors the cruise control switch signal. If the PCM detects that any one of following switches (Main, CANCEL, SET/COAST, RESUME/ACCEL) remains on for **2 min**, the PCM determines that the cruise control switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • S are stored in PCM memory.
POSSIBLE CAUSE	• Cruise control switch malfunction • Connector or terminal malfunction • Short to power circuit in wiring harness from cruise control switch terminal A and PCM terminal 1AQ • Short to ground circuit in wiring harness from cruise control switch terminal A and PCM terminal 1AQ • PCM malfunction



CRUISE CONTROL SWITCH
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

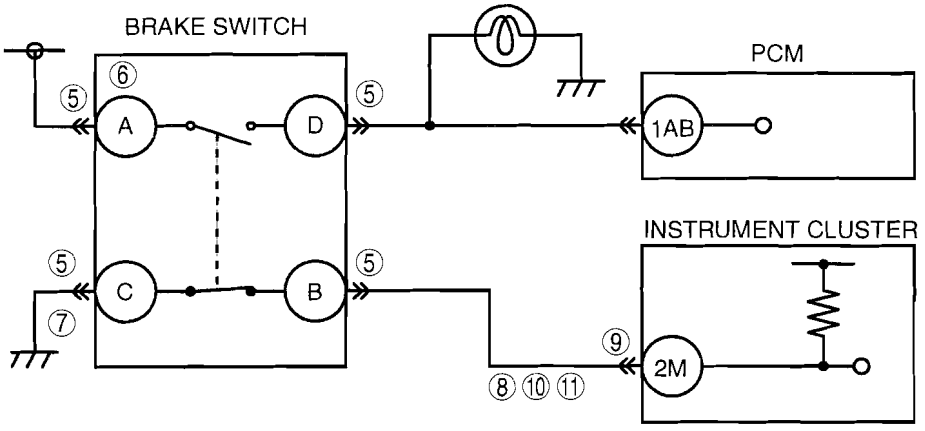
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.) • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
3	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Disconnect the cruise control switch and PCM connectors. • Inspect for continuity between cruise control switch terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace for a short to ground, then go to Step 6.
		No	Go to the next step.
4	**INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Inspect the voltage between cruise control switch terminal A (wiring harness-side) and body ground. • Is the voltage **below 1.0 V**?	Yes	Go to the next step.
		No	Repair or replace for a short to the power supply, then go to Step 6.
5	**INSPECT CRUISE CONTROL SWITCH OPERATION** • Inspect the cruise control switch. (See01-20B-2 CRUISE CONTROL SWITCH INSPECTION[L3 WITH TC].) • Is the cruise control switch normal?	Yes	Go to the next step.
		No	Replace the cruise control switch, then go to the next step.
6	**VERIFY TROUBLESHOOTING OF P0564 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle using cruise control for **2 min. or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

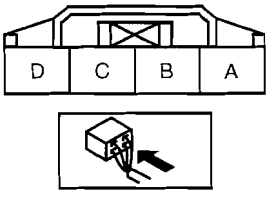
DTC P0571[L3 WITH TC]

id010239809000

DTC P0571	Brake switch circuit problem
DETECTION CONDITION	• The PCM monitors the change in the input voltage for brake switch No.1 and No.2. If the PCM detects that both brake switches No.1 and No.2 remain on or off for **15 s**, it determines that the brake switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Open circuit between brake switch terminal B and instrument cluster terminal 2M • Open circuit between brake switch terminal C and body ground • Short to power between brake switch terminal B and instrument cluster terminal 2M • Short to ground circuit between brake switch terminal B and instrument cluster terminal 2M • Communication error between PCM and instrument cluster • PCM malfunction



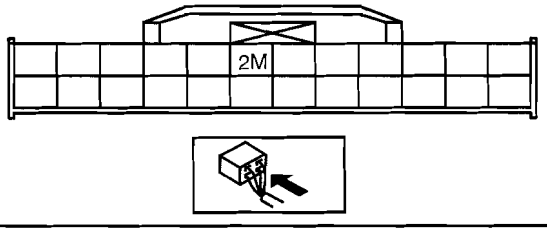
BRAKE SWITCH
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

INSTRUMENT CLUSTER
WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY DTC FOR MODULE COMMUNICATION** • Connect M-MDS to DLC-2. • Turn the ignition switch to the ON position (Engine off). • Verify stored DTC. • Is DTC U0155 stored?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P0703 also present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
5	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
6	**INSPECT BRAKE SWITCH** • Inspect the brake switch. • Is the brake switch normal?	Yes	Go to the next step.
		No	Replace brake switch, then go to Step 11.
7	**INSPECT GROUND CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 11.
8	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO GROUND** • Inspect for continuity between brake switch terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground circuit, then go to Step 11.
		No	Go to the next step.
9	**INSPECT INSTRUMENT CLUSTER CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect instrument cluster connector. • Inspect for poor connection (such as damaged, pull-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
10	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal B (wiring harness-side) and instrument cluster terminal 2M (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 11.

STEP	INSPECTION		ACTION
11	**INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO POWER** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between brake switch terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power circuit, then go to the next step.
		No	Go to the next step.
12	**VERIFY TROUBLESHOOTING OF P0571 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off). • Depress and release the brake pedal **more than 5 times**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Troubleshooting completed.

DTC P0601[L3 WITH TC]

id010239809100

DTC P0601	Internal control module memory check sum error
DETECTION CONDITION	• PCM internal memory check sum error. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• PCM internal memory malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0601 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is same DTC present?	Yes	Replace the PCM, go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0602[L3 WITH TC]

id010239809200

DTC P0602	PCM programming error
DETECTION CONDITION	• No configuration data in PCM **Note** • If the "PCM CONFIGURATION" is successful, the PCM stores DTC P0602 and illuminates the MIL (System is normal). Clear DTC P0602 using the M-MDS after the "PCM CONFIGURATION". • MIL turns off after three drive cycles with no failure (DTCs remain in PCM). **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Configuration has not been completed. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0604[L3 WITH TC]

id010239809300

DTC P0604	PCM RAM error
DETECTION CONDITION	• PCM internal RAM malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• PCM internal RAM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0604 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0606[L3 WITH TC]

id010239809400

DTC P0606	ECM/PCM processor
DETECTION CONDITION	• PCM internal CPU malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• PCM internal CPU malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0606 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0607[L3 WITH TC]

id010239809500

DTC P0607	PCM performance problem
DETECTION CONDITION	• PCM internal malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• PCM internal malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BLLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P0607 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start engine. • Is same DTC present?	Yes	Replace PCM, go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0610[L3 WITH TC]

id010239809600

DTC P0610	PCM vehicle options error
DETECTION CONDITION	• PCM data configuration error **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Configuration procedure has not been completed • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0638[L3 WITH TC]

id010239809800

DTC P0638	Throttle actuator control range/performance
DETECTION CONDITION	• The PCM compares the actual TP with the target TP when the engine is running. If the difference is more than the specification, the PCM determines that there is a throttle actuator control circuit range/ performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

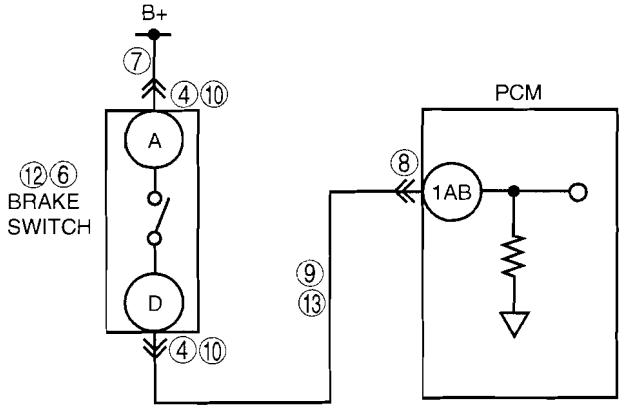
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FOR OTHER DTCS** • Have other DTCs been stored?	Yes	Perform the diagnostic procedure for the applicable DTCs.
		No	Go to the next step.
4	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See 01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC]) • Is the throttle actuator normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF P0638 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and let it idle. • Is the same DTC present?	Yes	Replace the PCM, go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

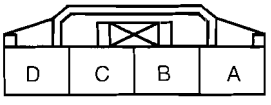
DTC P0703[L3 WITH TC]

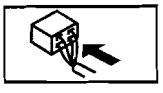
id010239809900

DTC P0703	Brake switch No.1 circuit malfunction
DETECTION CONDITION	• PCM monitors changes in the input voltage from the brake switch. If the PCM does not detect the voltage change while alternately accelerating and decelerating **8 times**, the PCM determines that the brake switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Brake switch malfunction • Poor connection of the brake switch connector or the PCM connector • Short to the power supply between brake switch terminal D and PCM connector terminal 1AB • Open circuit between brake switch terminal D and PCM connector terminal 1AB • Open circuit between the battery positive terminal and brake switch terminal A • PCM malfunction



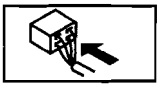
BRAKE SWITCH
WIRING HARNESS SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

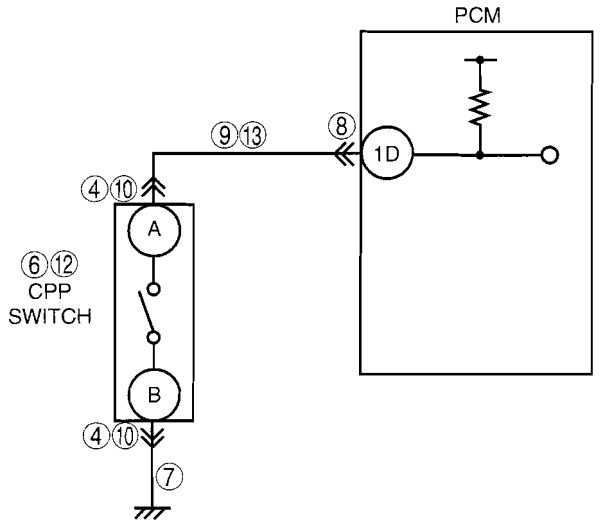
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to the DLC-2. • Access the BOO PID. • Verify the BOO PID during brake pedal operation. • Is the BOO PID always off?	Yes	Go to the next step.
		No	Go to Step 10.
4	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the brake switch connector. • Inspect for poor connection (such as damaged pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the BOO PID. • Connect a jumper wire between brake switch terminal A and D (harness-side). • Is the BOO PID on?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT BRAKE SWITCH** • Perform the brake switch inspection. (See04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to Step 14.
		No	Replace the brake switch, then go to Step 14.
7	**INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT** • Measure the voltage between brake switch connector terminal A (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the brake switch power circuit for an open circuit, then go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between brake switch terminal D (harness-side) and PCM terminal 1AB (harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect brake switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**CLASSIFY BRAKE SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the BOO PID. • Verify that the BOO PID changes from on to off when the brake switch connector is disconnected. • Does BOO PID change from on to off?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT BRAKE SWITCH** • Perform the brake switch inspection. (See04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to Step 14.
		No	Replace the brake switch, then go to Step 14.
13	**INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Measure the voltage between brake switch connector terminal D (harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to Step 14.
		No	Go to the next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive vehicle at **30 km/h {18.6 mph} or more.** • Depress and release brake pedal **more than 8 times** while driving the vehicle. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

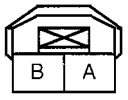
DTC P0704[L3 WITH TC]

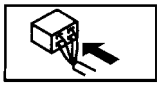
id010239810000

DTC P0704	Clutch pedal position switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in the input voltage from the clutch pedal position (CPP) switch. If the PCM does not detect the voltage change while the vehicle is run with vehicle speed **above 30 km/h {19 mph}** and stopped **8 times** alternately, the PCM determines that the CPP switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Clutch switch malfunction • Poor connection of the CPP switch connector or the PCM connector • Short to ground between CPP switch terminal A and PCM connector terminal 1D • Open circuit between CPP switch terminal A and PCM connector terminal 1D • Open circuit between ground and CPP switch terminal B • PCM malfunction



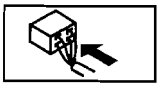
CPP SWITCH
WIRING HARNESS SIDE
CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to the DLC-2. • Access the CPP PID. • Verify the CPP PID during clutch pedal operation. • Is the CPP PID always off?.	Yes	Go to Next step.
		No	Go to Step 10.
4	**INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the CPP switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	**CLASSIFY CPP SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the CPP PID. • Connect a jumper wire between CPP switch terminal A and B (harness-side). • Is the CPP PID on?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT CPP SWITCH** • Perform the CPP switch inspection. (See 01-40B-23 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC].) • Is the CPP switch normal?	Yes	Go to Step 14.
		No	Replace the CPP switch, then go to Step 14.
7	**INSPECT CPP SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between CPP switch terminal B (harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the CPP switch power circuit for an open circuit, then Go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT CPP SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between CPP switch terminal A (harness-side) and PCM terminal 1D (harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the CPP switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
11	**CLASSIFY CPP SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the CPP PID. • Verify that the CPP PID changes from on to off when the CPP switch connector disconnected. • Does the CPP PID change from on to off?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT CPP switch** • Perform the CPP switch inspection. (See 01-40B-23 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC].) • Is the CPP switch normal?	Yes	Go to Step 14.
		No	Replace the CPP switch, then go to Step 14.
13	**INSPECT CPP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between CPP switch terminal A and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 14.
		No	Go to Next step.

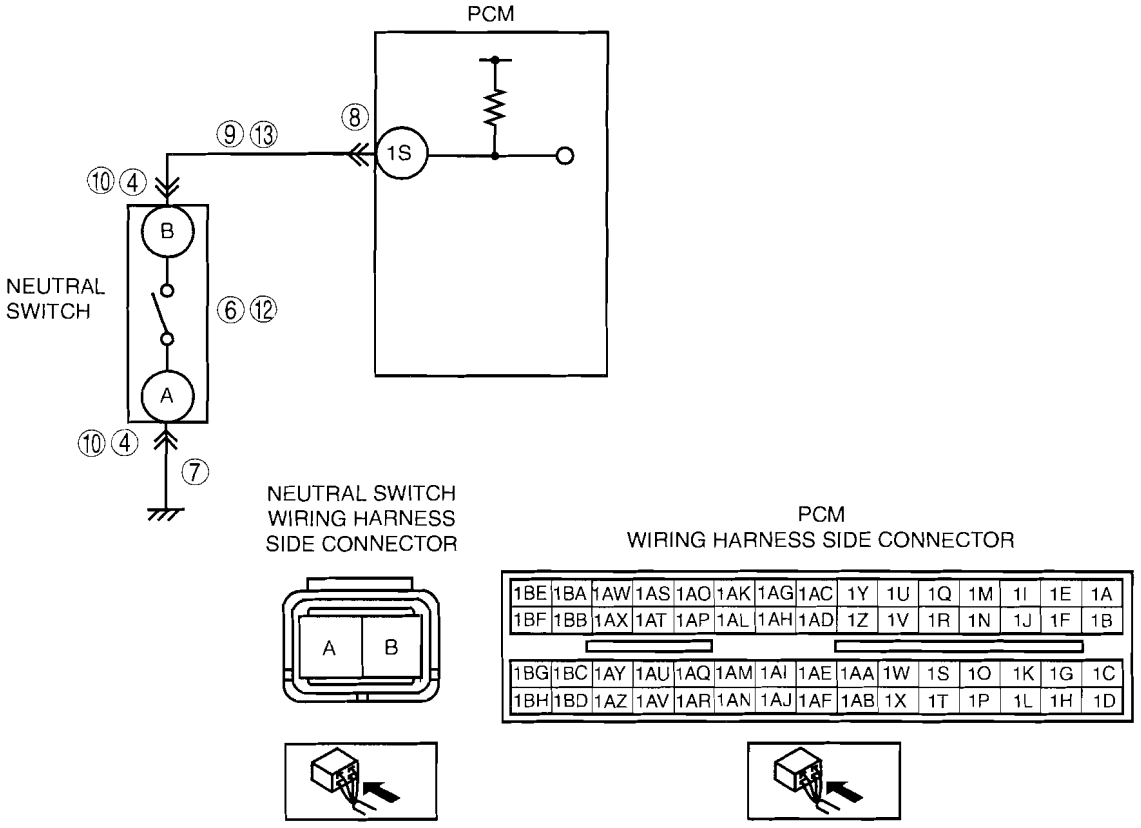
STEP	INSPECTION		ACTION
14	**VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Operate the clutch pedal while driving the vehicle **below 30 km/h {19 mph} and stopping 8 times** alternately. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P0850[L3 WITH TC]

id010239810100

DTC P0850	Neutral switch circuit malfunction
DETECTION CONDITION	• PCM monitors changes in the input voltage from the neutral switch. If the PCM does not detect the voltage change while running the vehicle with vehicle speed **above 30 km/h {19 mph}** and the clutch pedal turns release and depress **10 times** repeatedly, the PCM determines that the neutral switch circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.

DTC P0850	Neutral switch circuit malfunction
POSSIBLE CAUSE	• Neutral switch malfunction • Poor connection of the neutral switch connector or PCM connector • Short to ground between neutral switch terminal B and PCM connector terminal 1S • Open circuit in the wiring harness between neutral switch terminal B and PCM connector terminal 1S • Open circuit in the wiring harness between ground and brake switch terminal A. • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY HIGH INPUT OR LOW INPUT** • Connect the M-MDS to the DLC-2. • Access the CPP/PNP PID. • Verify the CPP/PNP PID when gear is in the neutral position. • Is the CPP/PNP PID always off?.	Yes	Go to Next step.
		No	Go to Step 10.
4	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the neutral switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the CPP/PNP PID. • Connect a jumper wire between neutral switch terminal A and B (harness-side). • Is the CPP/PNP PID on?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT NEUTRAL SWITCH** • Perform the neutral switch inspection. (See 01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC].) • Is the neutral switch normal?	Yes	Go to Step 14.
		No	Replace the neutral switch, then go to Step 14.
7	**INSPECT NEUTRAL SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between neutral switch terminal A (harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the neutral switch power circuit for an open circuit, then go to Step 14.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between neutral switch terminal B (harness-side) and PCM terminal 1S (harness-side). • Is there continuity?	Yes	Repair or replace wiring harness for an open circuit, then go to Step 14.
		No	Go to Step 14.
10	**INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect neutral switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
11	**CLASSIFY NEUTRAL SWITCH OR CIRCUIT** • Connect the M-MDS to the DLC-2. • Access the CPP/PNP PID. • Verify that the CPP/PNP PID changes from on to off when the neutral switch connector is disconnected. • Does the CPP/PNP PID change from on to off?	Yes	Go to the next step.
		No	Go to Step 13.
12	**INSPECT NEUTRAL SWITCH** • Perform the neutral switch inspection. (See 01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC].) • Is the neutral switch normal?	Yes	Go to Step 14.
		No	Replace the neutral switch, then go to Step 14.
13	**INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between neutral switch terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 14.
		No	Go to the next step.
14	**VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Drive vehicle **above 30 km/h {19 mph}** and stop vehicle. • Depress and release clutch pedal **more than 10 times** during the drive cycle. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P1260[L3 WITH TC]

id010239815600

DTC P1260	Immobilizer system problem
DETECTION CONDITION	• The instrument cluster detects an immobilizer system malfunction. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Immobilizer system malfunction • PCM malfunction

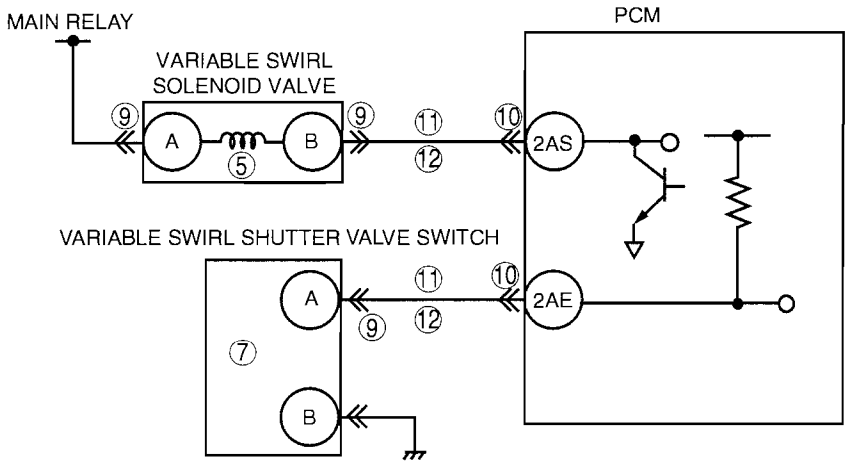
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY STORED DTC IN INSTRUMENT CLUSTER** • Turn the ignition switch to the ON position (Engine off). • Verify stored DTCs in instrument cluster. • Are DTCs stored?	Yes	Go to the applicable DTC inspection.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P1260 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine or perform the KOEO self-test with M-MDS. • Is PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

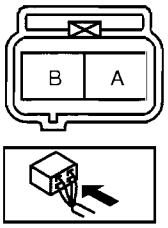
DTC P2004[L3 WITH TC]

id010239810200

DTC P2004	Variable swirl control system shutter valve stuck open
DETECTION CONDITION	• PCM monitors the mass variable swirl shutter valve position using the variable swirl shutter valve switch. If the PCM turns variable swirl solenoid valve on but variable swirl shutter valve position still remains open (variable swirl shutter valve switch is on), the PCM determines that the variable swirl shutter valve is stuck open. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Variable swirl shutter valve actuator malfunction (stuck open) • Misconnected or pulled out vacuum hose • Variable swirl shutter valve switch malfunction • Variable swirl solenoid valve malfunction • Connector or terminal malfunction • Open circuit in the wiring harness between variable swirl solenoid valve terminal B and PCM terminal 2AS • Short to power in the wiring harness between variable swirl solenoid valve terminal B and PCM terminal 2AS • Open circuit in the wiring harness between variable swirl shutter valve switch terminal A and PCM terminal 2AE • Short to power in the wiring harness between variable swirl shutter valve switch terminal A and PCM terminal 2AE • PCM malfunction

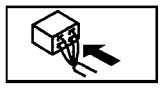


VARIABLE SWIRL SOLENOID VALVE WIRING HARNESS SIDE CONNECTOR

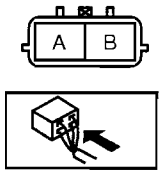


PCM WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



VARIABLE SWIRL SHUTTER VALVE SWITCH WIRING HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle under the following conditions: — Engine coolant temperature is **above 63 °C {145 °F}.** — Engine speed: **below 3,750 rpm** — Throttle opening angle is as follows: • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500—2,500 rpm: between 25—35%** • Engine speed **above 2,500: below 25%** • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
4	**VERIFY IF STORED OTHER DTCs STORED** • Verify stored DTCs using the M-MDS. • Is DTC P2088 or P2089 present?	Yes	Go to the appropriate DTC troubleshooting procedures.
		No	Go to the next step.
5	**INSPECT VARIABLE SWIRL SOLENOID VALVE** • Perform "VARIABLE SWIRL SOLENOID VALVE INSPECTION". (See01-13B-14 VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the variable swirl solenoid valve normal?	Yes	Go to the next step.
		No	Replace variable swirl solenoid valve, then go to Step 13.
6	**INSPECT VARIABLE SWIRL SHUTTER VALVE ACTUATOR** • Perform "VARIABLE SWIRL SHUTTER VALVE ACTUATOR INSPECTION". (See01-13B-14 VARIABLE SWIRL SHUTTER VALVE ACTUATOR INSPECTION[L3 WITH TC].) • Is the variable swirl shutter valve actuator normal?	Yes	Go to the next step.
		No	Replace the intake manifold, then go to Step 13.
7	**INSPECT VARIABLE SWIRL SHUTTER VALVE SWITCH** • Perform the "VARIABLE SWIRL SHUTTER VALVE SWITCH INSPECTION". (See01-13B-14 VARIABLE SWIRL SHUTTER VALVE ACTUATOR INSPECTION[L3 WITH TC].) • Is the variable swirl shutter valve switch normal?	Yes	Go to the next step.
		No	Replace the intake manifold, then go to Step 13.
8	**VERIFY CONNECTION OF VACUUM HOSE ROUTING** • Verify that the vacuum hoses are connected properly. • Are the vacuum hoses connected properly?	Yes	Go to the next step.
		No	Connect the vacuum hoses properly, then go to the next step.

STEP	INSPECTION		ACTION
9	**INSPECT VARIABLE SWIRL SOLENOID VALVE OR VARIABLE SWIRL SHUTTER VALVE SWICTH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the variable swirl solenoid valve connector and variable swirl shutter valve switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
11	**INSPECT VARIABLE SWIRL SOLENOID VALVE OR VARIABLE SWIRL SHUTTER VALVE SW SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the following terminals: — Variable swirl solenoid valve terminal B (harness-side) and PCM terminal 2AS (harness-side). — Variable swirl shutter valve sw terminal A (harness-side) and PCM terminal 2AE (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 13.
12	**INSPECT VARIABLE SWIRL SOLENOID VALVE OR VARIABLE SWIRL SHUTTER VALVE SWITCH CIRCUIT FOR SHORT TO POWER SUPPLY** • Disconnect the variable swirl solenoid valve connector and variable swirl shutter valve switch connector. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals and body ground. — PCM terminal 2AS (harness-side). — PCM terminal 2AE (harness-side). • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to the next step.
		No	Go to the next step.
13	**VERIFY TROUBLESHOOTING OF DTC P2004 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Drive the vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}.** — Engine speed: **below 3,750 rpm** — Throttle opening angle is as follows • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500—2,500 rpm: between 25—35%** • Engine speed **above 2,500:below 25%** • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM INSPECTION[L3 WITH TC].)
		No	Go to the next step.

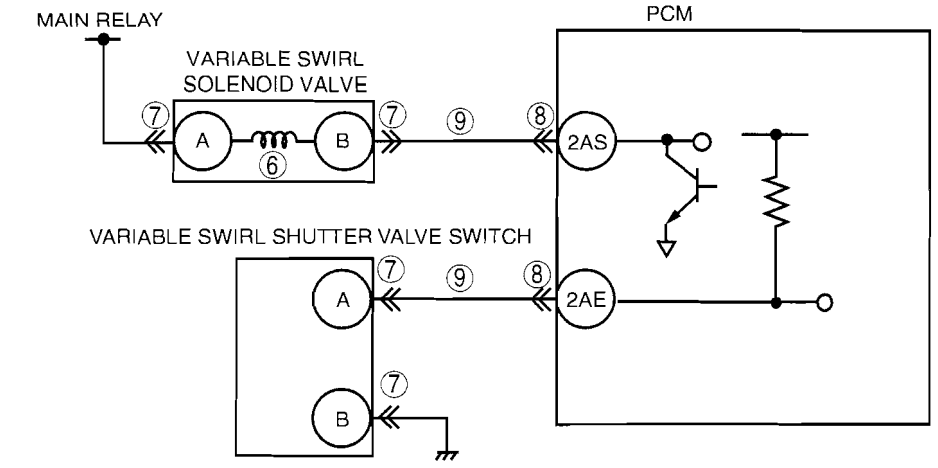
STEP	INSPECTION		ACTION
14	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2006[L3 WITH TC]

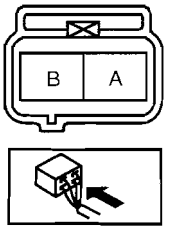
id010239810300

DTC P2006	Variable swirl control system shutter valve stuck closed
DETECTION CONDITION	• PCM monitors the mass variable swirl shutter valve position using the variable swirl shutter valve switch. If PCM turns the variable swirl solenoid valve off but the variable swirl position still remains closed (variable swirl shutter valve switch is off), the PCM determines that the variable swirl shutter valve is stuck closed. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• ECT sensor malfunction • TP sensor malfunction • CKP sensor malfunction • Connector or terminal malfunction • Variable swirl solenoid valve malfunction • Variable swirl shutter valve malfunction (stuck closed) • Variable swirl shutter valve actuator malfunction (stuck closed). • Short to ground circuit between variable swirl solenoid valve terminal B and PCM terminal 2AS • Short to ground in the wiring harness between variable swirl shutter valve switch terminal A and PCM terminal 2AE • PCM malfunction

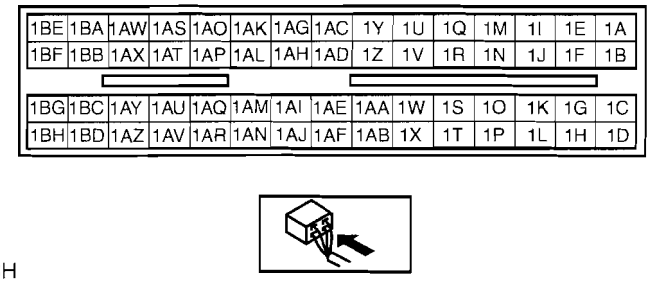
DTC P2006	Variable swirl control system shutter valve stuck closed



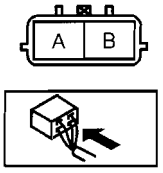
VARIABLE SWIRL SOLENOID VALVE WIRING HARNESS SIDE CONNECTOR



PCM WIRING HARNESS SIDE CONNECTOR



VARIABLE SWIRL SHUTTER VALVE SWITCH WIRING HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC from the PCM memory using the M-MDS. • Drive the vehicle under following conditions: — Engine coolant temperature is **above 63 °C {145 °F}.** — Engine speed: **below 3,750 rpm** — Throttle opening angle is as follows: • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500—2,500 rpm: between 25—35%** • Engine speed **above 2,500: below 25%** • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)

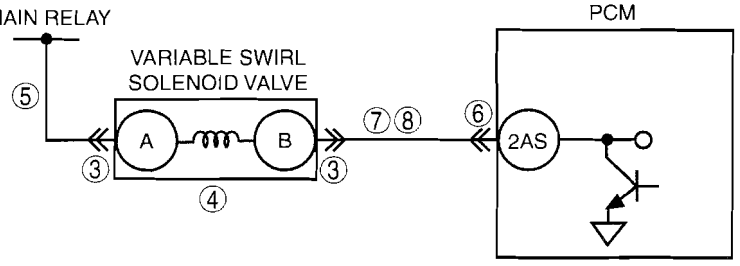
STEP	INSPECTION		ACTION
4	**VERIFY STORED OTHER DTCS** • Verify stored DTCs using M-MDS or equipment. • Is other DTC present except P0117, P0118, P0121, P0122, P0123 and/or P0335?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to the next step.
5	**INSPECT VARIABLE SWIRL SHUTTER VALVE ACTUATOR** • Perform the "Variable Swirl System Operation Inspection". (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the variable swirl shutter valve actuator normal?	Yes	Go to the next step.
		No	Replace the variable swirl shutter valve actuator, then go to Step 10.
6	**INSPECT VARIABLE SWIRL SOLENOID VALVE** • Perform the "variable swirl solenoid valve airflow inspection". (See01-13B-14 VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the variable swirl solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable swirl solenoid valve, then go to Step 10.
7	**INSPECT VARIABLE SWIRL SOLENOID VALVE OR VARIABLE SWIRL SHUTTER VALVE SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the variable swirl solenoid valve connector and the variable swirl shutter valve switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 10.
		No	Go to the next step.
8	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Inspect for poor connection at the PCM terminals (such as damaged, pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to the next step.
9	**INSPECT VARIABLE SWIRL SOLENOID VALVE OR VARIABLE SWIRL SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between the following terminals and body ground. — PCM terminal 2AS (harness-side). — PCM terminal 2AE (harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to the next step.
		No	Go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2006 COMPLETED** • Make sure to reconnect all disconnected connectors. • Start the engine. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Drive the vehicle under the following conditions: — Engine coolant temperature is **above 63 °C {145 °F}.** — Engine speed: **below 3,750 rpm** — Throttle opening angle is as follows: • Engine speed **below 1,500 rpm: above 35%** • Engine speed **between 1,500—2,500 rpm: between 25—35%** • Engine speed **above 2,500: below 25%** • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

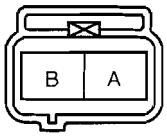
DTC P2009[L3 WITH TC]

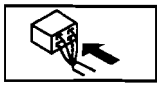
id010239810400

DTC P2009	Variable swirl solenoid valve control circuit low
DETECTION CONDITION	• PCM monitors the variable swirl solenoid valve control signal. If the PCM turns variable swirl solenoid valve off but the voltage still remains low, the PCM determines that the variable swirl solenoid valve control circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at PCM and/or variable swirl solenoid valve • Short to ground in the wiring harness between variable swirl solenoid valve terminal B and PCM terminal 2AS • Open circuit in the wiring harness between main relay and variable swirl solenoid valve terminal A • Open circuit in the wiring harness between variable swirl solenoid valve terminal B and PCM terminal 2AS • Variable swirl solenoid valve malfunction • PCM malfunction



VARIABLE SWIRL SOLENOID VALVE WIRING HARNESS SIDE CONNECTOR





PCM WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

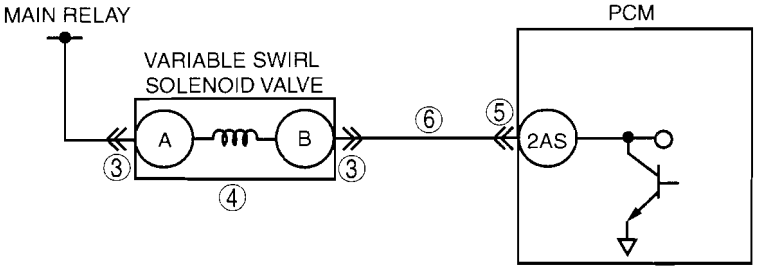
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT VARIABLE SWIRL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT VARIABLE SWIRL SOLENOID VALVE** • Perform the variable swirl solenoid valve inspection. (See01-13B-14 VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the variable swirl solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable swirl solenoid valve, then go to Step 9.
5	**INSPECT VARIABLE SWIRL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect the variable swirl solenoid valve connector. • Turn ignition switch to the ON position (Engine off). • Measure voltage between variable swirl solenoid valve terminal A (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2AS. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 9.
		No	Go to the next step.
7	**INSPECT VARIABLE SWIRL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between variable swirl solenoid valve terminal B (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 9.
		No	Go to the next step.
8	**INSPECT VARIABLE SWIRL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect variable swirl solenoid valve connector. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 2AS (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open or short to ground circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2009 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

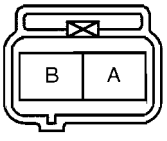
DTC P2010[L3 WITH TC]

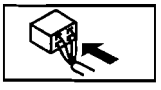
id010239810500

DTC P2010	Variable swirl solenoid valve control circuit high
DETECTION CONDITION	• PCM monitors the variable swirl solenoid valve control signal. If the PCM turns variable swirl solenoid valve on but the voltage still remains high, the PCM determines that the variable swirl solenoid valve control circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at the PCM and/or the variable swirl solenoid valve • Short to the power supply in the wiring harness between variable swirl solenoid valve terminal B and PCM terminal 2AS • Variable swirl solenoid valve malfunction • PCM malfunction

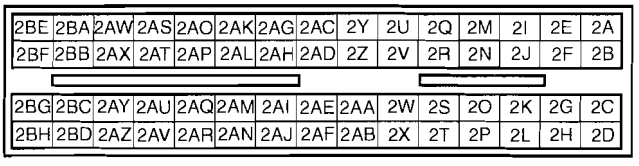


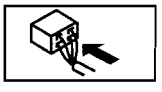
VARIABLE SWIRL SOLENOID VALVE WIRING HARNESS SIDE CONNECTOR





PCM WIRING HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VARIABLE SWIRL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.

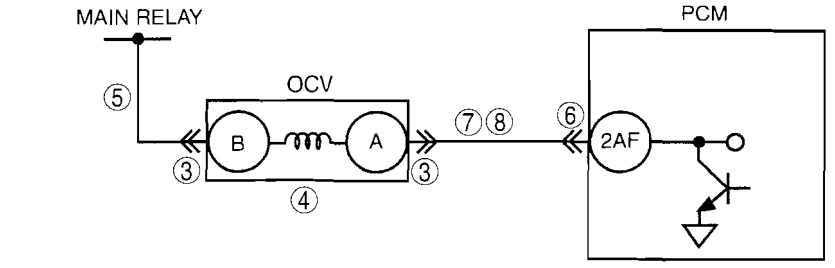
STEP	INSPECTION		ACTION
4	**INSPECT VARIABLE SWIRL SOLENOID VALVE** • Perform variable swirl solenoid valve inspection. (See01-13B-14 VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC].) • Is the variable swirl solenoid valve normal?	Yes	Go to the next step.
		No	Replace the variable swirl solenoid valve, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2AS. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT VARIABLE SWIRL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Remove the variable swirl solenoid valve. • Turn ignition switch to the ON position (Engine off). • Measure voltage between PCM terminal 2AS (harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2010 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2088[L3 WITH TC]

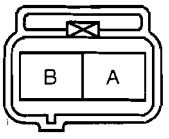
id010239810600

DTC P2088	OCV actuator circuit low
DETECTION CONDITION	• PCM monitors the OCV voltage. If the PCM detects that the OCV control voltage (calculated from OCV) is below the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection of connectors at the PCM and/or OCV • Short to ground in the wiring harness between OCV terminal A and PCM terminal 2AF • Open circuit in the wiring harness between main relay and OCV terminal B • Open circuit in the wiring harness between OCV terminal A and PCM terminal 2AF • OCV malfunction • PCM malfunction

DTC P2088	OCV actuator circuit low

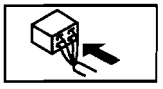


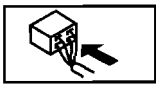
OCV
WIRING HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	**INSPECT OCV** • Perform the OCV inspection. (See01-10B-34 OIL CONTROL VALVE (OCV) INSPECTION[L3 WITH TC].) • Is the OCV normal?	Yes	Go to the next step.
		No	Replace OCV, then go to Step 9.
5	**INSPECT OCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect the OCV connector. • Turn ignition switch to the ON position (Engine off). • Measure voltage between OCV terminal B (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2AF. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.

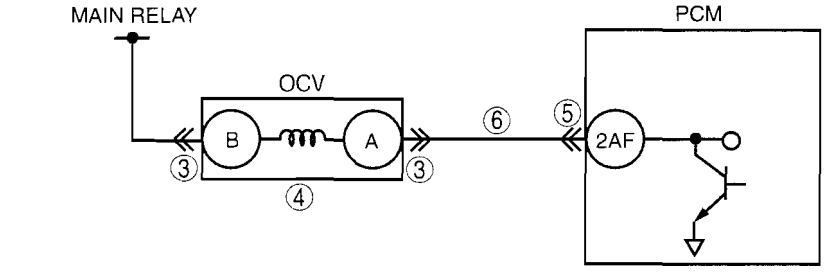
STEP	INSPECTION		ACTION
7	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between OCV terminal A (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 9.
		No	Go to the next step.
8	**INSPECT OCV CONTROL CIRCUIT FOR OPEN CIRCUIT** • Connect the OCV connector. • Turn ignition switch to the ON position (Engine off). • Check for continuity between OCV terminal A (harness-side) and PCM terminal 2AF (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open or short to ground circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2088 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2089[L3 WITH TC]

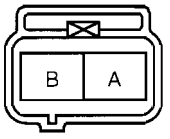
id010239810700

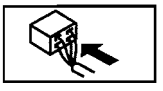
DTC P2089	OCV actuator circuit high
DETECTION CONDITION	• PCM monitors the OCV voltage. If the PCM detects that the OCV control voltage (calculated from OCV) is above the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Poor connection at the PCM and/or OCV connectors • Short to the power supply in the wiring harness between OCV terminal A and PCM terminal 2AF • OCV malfunction • PCM malfunction

DTC P2089	OCV actuator circuit high



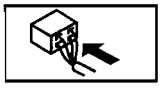
OCV
WIRING HARNESS SIDE CONNECTOR





PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT OCV CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT OCV** • Perform the OCV inspection. (See01-10B-34 OIL CONTROL VALVE (OCV) INSPECTION[L3 WITH TC].) • Is the OCV normal?	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection at PCM terminal 2AF. (such as damaged, pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to the next step.
6	**INSPECT OCV CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Remove the OCV. • Turn the ignition switch to the ON position (Engine off). • Measure voltage between PCM terminal 2AF and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY TROUBLESHOOTING OF DTC P2089 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to off. • Start the engine and warm it up completely. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2096[L3 WITH TC]

id010239810800

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim while under target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean. • Rear HO2S sensor voltage is **more than 0.1 V** **Diagnostic support note** • This is a continuous monitor (Fuel system). • The MIL does not illuminate. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Exhaust gas leakage • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Air suction in intake-air system • Front HO2S malfunction • MAF sensor malfunction • Insufficient fuel line pressure • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • Leakage fuel • Improper operation ignition system • Insufficient engine compression • Fuel injector malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2096 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access O2S12 PID. • Read O2S12 PID under the following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the TWC and rear HO2S. • If there is no leakage, replace the rear HO2S. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) Then go to Step 20.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 20.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 20.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **–0.1—0.1A** when idle. — Engine speed is **more than 3,000 rpm**. — **More than 0.25 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) Then go to Step 20.
9	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 20.

STEP	INSPECTION		ACTION
10	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect the hose in intake-air system for looseness, cracks or damages. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 20.
		No	Go to the next step.
11	**INSPECT IGNITION COIL WIRING HARNESSES** • Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. • Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses, then go to Step 20.
12	**INSPECT IGNITION SYSTEM OPERATION** • Perform the spark test. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result. Then go to Step 20.
13	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 20.
14	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 18.
		No	Go to the next step.
15	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 17.
16	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 18.
		No	Replace the fuel delivery pipe, then go to Step 20.
17	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump. • Monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 20.
		No	Go to the next step.
18	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to Step 20.
19	**INSPECT FUEL INJECTOR** • Inspect the fuel injector. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the fuel injector, then go to the next step. (See01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
20	**VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
21	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2097[L3 WITH TC]

id010239810900

DTC P2097	Target A/F feedback system too rich
DETECTION CONDITION	• The PCM monitors the target A/F fuel trim while under target A/F feedback control. If the fuel trim is less than specification, the PCM determines that the target A/F feedback system is too rich. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Exhaust gas leakage • Rear HO2S malfunction • IAT sensor malfunction • ECT sensor malfunction • Front HO2S malfunction • Excessive fuel line pressure • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • Purge valve malfunction • Insufficient engine compression • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch off, then to the ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2178 or P2188 also present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2097 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)

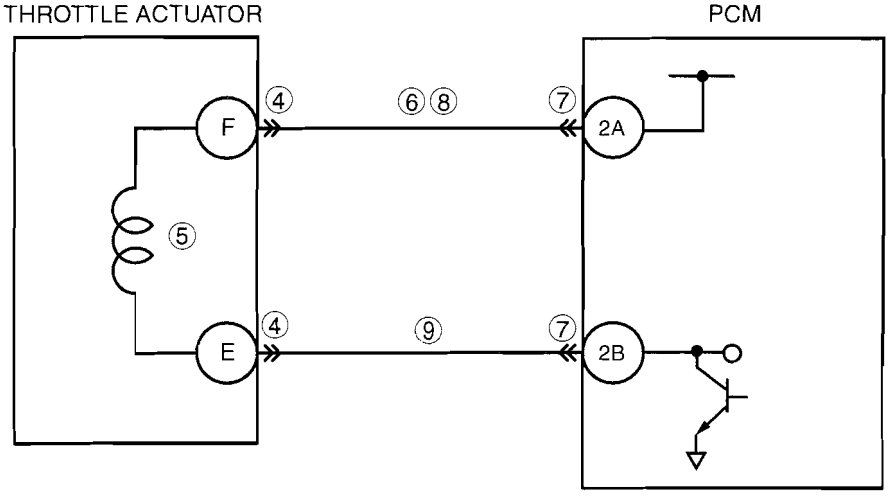
STEP	INSPECTION		ACTION
5	**VERIFY CURRENT INPUT SIGNAL STATUS OF REAR HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access the O2S12 PID. • Read the O2S12 PID under following accelerator pedal condition (in NEUTRAL). — **More than 0.45 V** when accelerator pedal is suddenly depressed (rich condition). — **Less than 0.45 V** just after release of accelerator pedal (lean condition) • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and rear HO2S. • If there is no leakage, replace rear HO2S. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) Then go to Step 15.
6	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs: (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 15.
7	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 15.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Connect the M-MDS to the DLC-2. • Start the engine and warm it up completely. • Access the O2S11 PID. • Read the O2S11 PID under following accelerator pedal condition (in NEUTRAL). — **−0.1—0.1A** when idle — Engine speed is **more than 3,000 rpm.** — **More than 0.25 mA** just after release of accelerator pedal (lean condition). • Is the PID normal?	Yes	Go to the next step.
		No	Visually inspect for exhaust gas leakage between the exhaust manifold and front HO2S. • If there is no leakage, replace front HO2S. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) Then go to Step 15.
9	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 14.
		No	Go to the next step.
10	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 12.
11	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 14.
		No	Replace the fuel delivery pipe, then go to Step 15.

STEP	INSPECTION		ACTION
12	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump. • Monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 15.
		No	Go to the next step.
13	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump. Then go to Step 15.
14	**INSPECT LONG TERM FUEL TRIM** • Connect the M-MDS to the DLC_2. • Access LONGFT1 PID. • Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1. • Is the LONGFT1 PID above FREEZE FRAME DATA?	Yes	Inspect the purge valve. (See01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) • If there is any malfunction, replace the purge valve. Then go to the next step.
		No	Go to the next step.
15	**VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

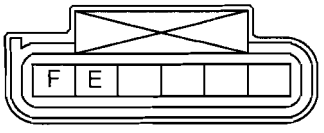
DTC P2100[L3 WITH TC]

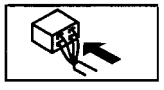
id010239811000

DTC P2100	Throttle actuator circuit open
DETECTION CONDITION	• PCM monitors the electronic throttle valve motor current. If the PCM detects that the electronic throttle valve motor current is below the threshold current, the PCM determines that the electronic throttle valve motor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Throttle valve motor malfunction • Open circuit between throttle body terminal F and PCM terminal 2A • Open circuit between throttle body terminal E and PCM terminal 2B • Poor connection of throttle body connector or PCM connector • PCM malfunction

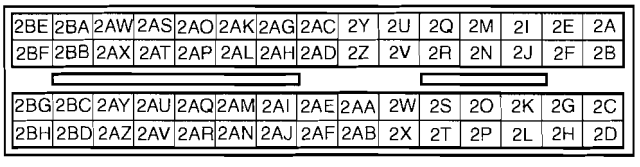


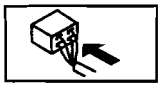
THROTTLE BODY
HARNESS SIDE CONNECTOR





PCM
WIRING HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN** • Clear the DTC using the M-MDS. • Start the engine and let it idle. • Is the same PENDING CODE present?	Yes	Go to the next step.
		No	Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the throttle body connector. • Check for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
5	**INSPECT THROTTLE VALVE ELECTRICAL MALFUNCTION** • Measure resistance between throttle body terminal E and F (part-side). • Is resistance approx.**1.3 ohms?**	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 10.
6	**CLASSIFY MALFUNCTION ET POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal F (harness-side) and body ground. • Is the voltage **B+?**	Yes	Malfunction at control circuit. Go to the next step.
		No	Malfunction at power supply circuit. Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Check for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair terminal, then go to Step 10.
		No	Go to the next step.
8	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to off. • Check for continuity between throttle body terminal F (harness-side) and PCM terminal 2A (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 10.
9	**INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT** • Check for continuity between throttle body terminal E (harness-side) and PCM terminal 2B (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2100 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2101[L3 WITH TC]

id010239811100

DTC P2101	Throttle actuator circuit range/performance
DETECTION CONDITION	• If any of the following conditions continue for a specified period of time or more the PCM detects a malfunction in the throttle actuator. — The voltage of the motor power supply is **4 V or less** while the motor relay is on — There is a system error in the electrical throttle control system of the PCM — The temperature of the electrical throttle control system in the PCM is **180 °C {356 °F}** **Diagnostic support note** • This is a continuous monitor. • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Drive-by-wire-relay and related circuit malfunction • Main relay and related circuit malfunction • Throttle position sensor No.1 and related circuit malfunction • Throttle position sensor No.2 and related circuit malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTCS** • Turn ignition switch to OFF, then ON (Engine off). • Verify pending and stored DTCs using the M-MDS. • Are any DTCs present?	Yes	Go to appropriate DTC troubleshooting procedure.
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2101 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
6	**INSPECT MAIN RELAY OUTPUT VOLTAGE** • Turn the ignition switch to off. • Connect the PCM connector. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 1BE and body ground. • Is the voltage **B+?**	Yes	Go to Step 13.
		No	Go to the next step.
7	**INSPECT MAIN RELAY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the main relay. • Inspect for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.

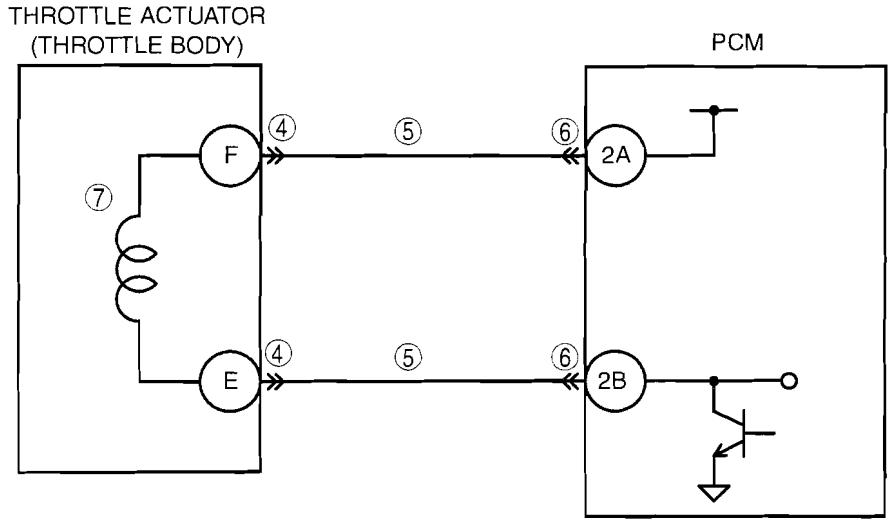
STEP	INSPECTION		ACTION
8	**INSPECT POWER SUPPLY OF MAIN RELAY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between main relay terminal D (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
9	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF MAIN RELAY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between main relay terminal A (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
10	**INSPECT MAIN RELAY** • Inspect the main relay. (See09-21-3 RELAY INSPECTION.) • Is the main relay normal?	Yes	Go to the next step.
		No	Replace the main relay, then go to Step 22.
11	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to off. • Disconnect the main relay and the PCM connector. • Check for continuity between main relay terminal C (harness-side) and PCM terminal 1BE (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
12	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between main relay terminal E (harness-side) and PCM terminal 1AT (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
13	**INSPECT DRIVE-BY-WIRE-RELAY OUTPUT VOLTAGE** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between PCM terminal 1BF (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a short to power supply, then go to Step 22.
14	**INSPECT DRIVE-BY-WIRE-RELAY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the drive-by-wire-relay. • Check drive-by-wire-relay connector (harness-side) for poor connection (such as damaged, pulled out terminals, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
15	**INSPECT POWER SUPPLY OF DRIVE-BY-WIRE-RELAY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between drive-by-wire-relay terminal D (harness-side) and body ground.	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
16	**INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF DRIVE-BY-WIRE-RELAY** • Turn ignition switch to the ON position (Engine off). • Measure the voltage between drive-by-wire-relay terminal E (harness-side) and body ground. • Is the voltage **B+?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit between drive-by-wire-relay terminal E and main relay terminal C, then go to Step 22.
17	**INSPECT DRIVE-BY-WIRE-RELAY** • Inspect the drive-by-wire-relay. (See09-21-3 RELAY INSPECTION.) • Is the drive-by-wire-relay normal?	Yes	Go to the next step.
		No	Replace the drive-by-wire-relay, then go to Step 22.

STEP	INSPECTION		ACTION
18	**INSPECT POWER CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to off. • Check for continuity between drive-by-wire-relay terminal C (harness-side) and PCM terminal 1BF (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
19	**INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Check for continuity between drive-by-wire-relay A (harness-side) and PCM terminal 1AX (harness-side).	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
20	**INSPECT THROTTLE POSITION SENSOR NO.1 OUTPUT VOLTAGE** • Turn the ignition switch to off. • Connect the PCM connector. • Turn ignition switch to the ON position (Engine off). • Check voltage between PCM terminal 2AK and body ground. • Is the voltage **0.40—0.60 V?**	Yes	Go to the next step.
		No	Check the throttle position sensor No.1 and related circuits and terminal. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) Repair or replace if necessary, then go to Step 22.
21	**INSPECT THROTTLE POSITION SENSOR NO.2 OUTPUT VOLTAGE** • Turn ignition switch to the ON position (Engine off). • Check the voltage between PCM terminal 2AL and body ground. • Is the voltage **4.40—4.60 V?**	Yes	Go to the next step.
		No	Check the throttle position sensor No.2 and related circuits and terminal. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) Repair or replace as necessary, then go to the next step.
22	**VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and run it at idle. • Turn ignition switch to OFF then ON (Engine off). • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
23	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

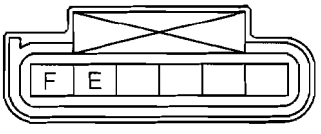
DTC P2102[L3 WITH TC]

id010239811200

DTC P2102	Throttle actuator circuit low input
DETECTION CONDITION	• PCM monitors the throttle actuator circuit current. If the PCM detects that the throttle actuator circuit current is excessively low, the PCM determines that the throttle actuator circuit was a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Short to ground circuit between throttle body terminal F and PCM terminal 2A • Short to ground circuit between throttle body terminal E and PCM terminal 2B • Poor connection of throttle body or PCM connector • Throttle actuator malfunction • PCM malfunction

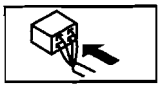


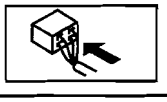
THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2Ai	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

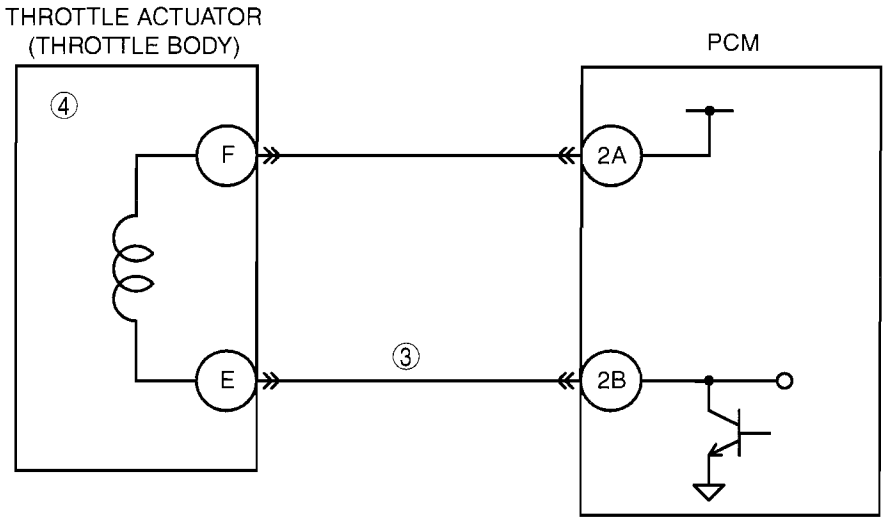
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn ignition switch to OFF, then ON (Engine off). • Verify pending and/or stored DTCs using the M-MDS. • Is the DTC P2100 also present?	Yes	Go to appropriate the DTC troubleshooting procedure, then go to Step 8.
		No	Go to the next step.
4	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged, pulled-put pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
5	**INSPECT POWER SUPPLY CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO GROUND** • Turn the ignition switch to off. • Check continuity between throttle body terminal E (harness-side) and body ground. • Check continuity between throttle body terminal F (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground circuit, then go to Step 8.
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2102 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

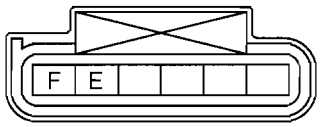
DTC P2103[L3 WITH TC]

id010239811300

DTC P2103	Throttle actuator circuit high input
DETECTION CONDITION	• PCM monitors the throttle actuator circuit current. If the PCM detects that the throttle actuator circuit current is excessively high, the PCM determines that the electronic throttle actuator circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Short to the power supply between throttle body terminal E and PCM terminal 2B • Throttle actuator malfunction • PCM malfunction

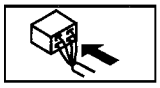


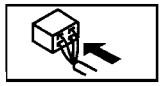
THROTTLE BODY
HARNESS SIDE CONNECTOR



PCM
WIRING HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT CONTROL CIRCUIT OF THROTTLE ACTUATOR FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to off. • Disconnect the throttle body and PCM connectors. • Turn ignition switch to the ON position (Engine off). • Measure the voltage between throttle body terminal E (harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness for a short to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2103 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2107[L3 WITH TC]

id010239811400

DTC P2107	Throttle actuator control module processor problem
DETECTION CONDITION	• Throttle actuator control module internal processor error **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator control module internal processor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF P2107 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P2108[L3 WITH TC]

id010239811500

DTC P2108	Throttle actuator control module performance problem
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that throttle actuator control system has a malfunction. — TP sensor power supply voltage **below 4.4 V** — TP sensor No.1 output voltage **below 0.20 V or above 4.85 V** (DTC P0122 or P0123) — TP sensor No.2 output voltage **below 0.20 V or above 4.85 V** (DTC P0222 or P0223) — PCM internal circuit for TP sensor No.1 input circuit malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit between throttle body terminal A and PCM terminal 2AK • Short to ground between throttle body terminal A and PCM terminal 2AK • Open circuit between throttle body terminal B and PCM terminal 2AO • Open circuit between throttle body terminal D and PCM terminal 2AP • Short to the power supply between throttle body terminal A and PCM terminal 2AK • Short to the power supply between throttle body terminal C and PCM terminal 2AL • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE AND STORED DTCS** • Turn ignition switch to OFF, then ON (Engine off). • Verify pending and/or stored DTCs using the M-MDS. • Is the DTC P0122, P0123, P0222 or P0223 also present?	Yes	Go to appropriate DTC troubleshooting procedure, then go to Step 7.
		No	Go to the next step.
4	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.1 CIRCUIT** • Perform the INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.1 related harnesses and connectors. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].) • Is there any malfunction?	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to the next step.
5	**VERIFY INTERMITTENT MALFUNCTION AT TP SENSOR NO.2 CIRCUIT** • Perform the INTERMITTENT TROUBLESHOOTING procedure to TP sensor No.2 related harnesses and connectors. (See01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].) • Is there any malfunction	Yes	Repair or replace malfunctioning part, according to inspection result, the go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT TP SENSOR** • Inspect the TP sensor. • Is the TP sensor normal?	Yes	Go to the next step.
		No	Replace the throttle body, then go to nest step.
7	**VERIFY TROUBLESHOOTING OF DTC P2108 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn ignition switch to the ON position (Engine off). • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2119[L3 WITH TC]

id010239811600

DTC P2119	Throttle actuator control throttle body range/performance problem
DETECTION CONDITION	• The PCM compares the TP with the default TP when the ignition switch is off. If the TP is higher than the default TP, the PCM determines that there is a throttle actuator control throttle body range/performance problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunctioning condition in the first drive cycles. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Throttle actuator malfunction • Throttle valve malfunction • PCM malfunction

Diagnostic procedure

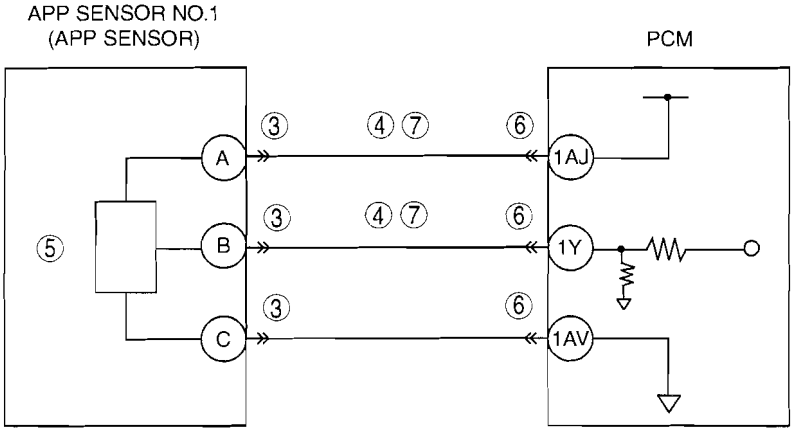
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE ACTUATOR** • Inspect the throttle actuator. (See01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 5. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT TP SENSOR** • Inspect the TP sensor. (See01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the TP sensor, then go to the next step. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Turn the ignition switch to the ON position (Engine off), then off. • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

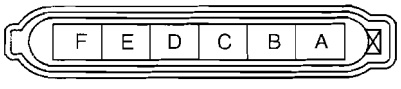
DTC P2122[L3 WITH TC]

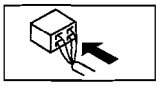
id010239811700

DTC P2122	Accelerator pedal position (APP) sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is **less than 0.12 V**, the PCM determines that the APP sensor No.1 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal A and PCM terminal 1AJ • Short to ground in wiring harness between APP sensor terminal A and PCM terminal 1AJ • Open circuit in wiring harness between APP sensor terminal B and PCM terminal 1Y • Short to ground in wiring harness between APP sensor terminal B and PCM terminal 1Y • PCM malfunction



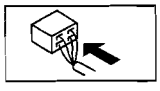
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



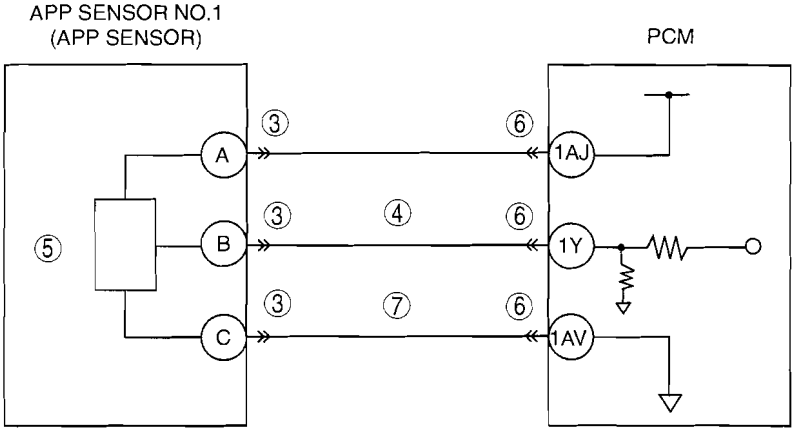
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.1 CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect for continuity between the following terminals and body ground: — APP sensor terminal A (wiring harness-side) and body ground — APP sensor terminal B (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.1 CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following terminals: — APP sensor terminal A (wiring harness-side) and PCM terminal 1AJ (wiring harness-side) — APP sensor terminal B (wiring harness-side) and PCM terminal 1Y (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

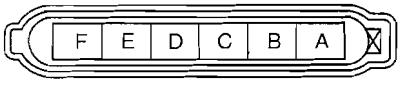
DTC P2123[L3 WITH TC]

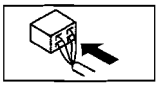
id010239811800

DTC P2123	Accelerator pedal position (APP) sensor No.1 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is **above 4.8 V**, the PCM determines that the APP sensor No.1 circuit input voltage is high. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • Connector or terminal malfunction • Short to power supply in wiring harness between APP sensor terminal B and PCM terminal 1Y • Open circuit in wiring harness between APP sensor terminal C and PCM terminal 1AV • PCM malfunction



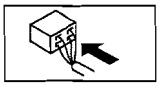
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.1** • Inspect APP sensor No.1. (See 01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.1 GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between APP sensor terminal C (wiring harness-side) and PCM terminal 1AV (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P2126[L3 WITH TC]

id010239840400

DTC P2126	Accelerator pedal position (APP) sensor No.2 range/performance problem
DETECTION CONDITION	• The PCM monitors the APP sensor duty signal. If the input signal (duty signal) is too high or too low than the set value, or the input signal intervals are too short or too long, the PCM determines that the APP sensor No.2 has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • PCM malfunction

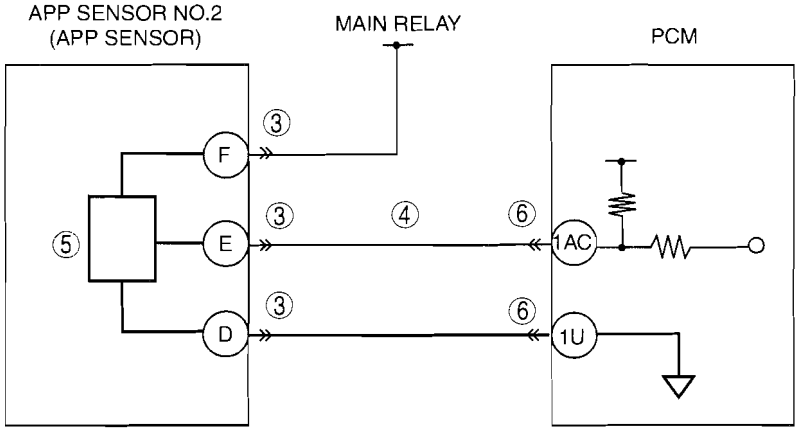
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR NO.2** • Inspect the APP sensor No.2. (See 01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 4. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2126 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

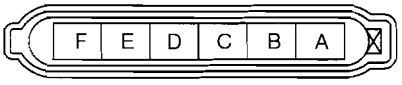
DTC P2127[L3 WITH TC]

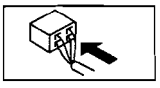
id010239811900

DTC P2127	Accelerator pedal position (APP) sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is **below 6.5 V** for **1s**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Short to ground in wiring harness between APP sensor terminal E and PCM terminal 1AC • PCM malfunction



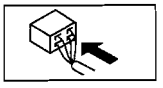
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



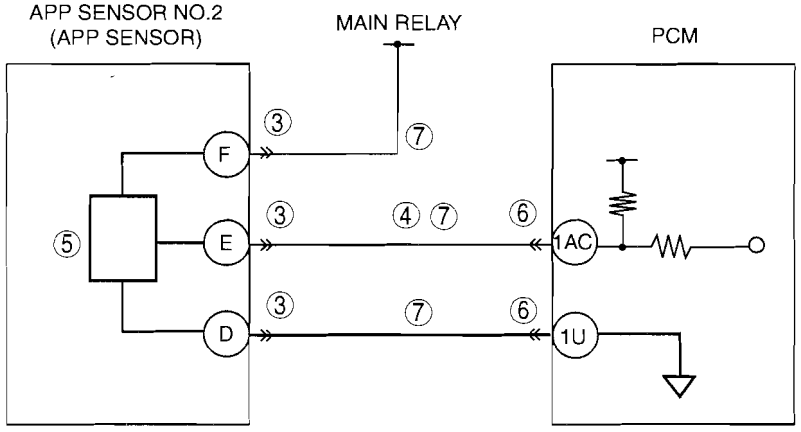
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.2 CIRCUIT FOR SHORT TO ground** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — APP sensor terminal E (wiring harness-side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 7.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.2** • Inspect the APP sensor No.2. (See 01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 7. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

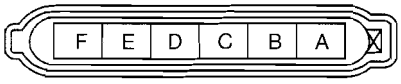
DTC P2128[L3 WITH TC]

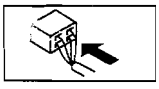
id010239812000

DTC P2128	Accelerator pedal position (APP) sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is **more than 6.5 V** for **1s**, the PCM determines that the APP sensor No.2 circuit has malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition. • FREEZE FRAME DATA is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.2 malfunction • Connector or terminal malfunction • Open circuit in wiring harness between APP sensor terminal F and main relay • Open circuit in wiring harness between APP sensor terminal D and PCM terminal 1U • Open circuit in wiring harness between APP sensor terminal E and PCM terminal 1AC • Short to power supply in wiring harness between APP sensor terminal E and PCM 1AC • PCM malfunction



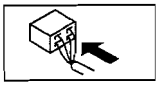
APP SENSOR
WIRING HARNESS-SIDE
CONNECTOR





PCM
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	**INSPECT APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between APP sensor terminal E (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	**INSPECT APP SENSOR NO.2** • Inspect APP sensor No.2. (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 8. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the following circuits: — APP sensor terminal D (wiring harness-side) and PCM terminal 1U (wiring harness-side) — APP sensor terminal E (wiring harness-side) and PCM terminal 1AC (wiring harness-side) — APP sensor terminal F (wiring harness-side) and main relay • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02A-16 AFTER REPAIR PROCEDURE[LF, L3].) • Is any DTC present?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	DTC troubleshooting completed.

DTC P2135[L3 WITH TC]

id010239812100

DTC P2135	TP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from TP sensor No.1 with the input voltage from TP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is a TP sensor No.1/No.2 voltage correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• TP sensor No.1 malfunction • TP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the throttle body connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT TP SENSOR** • Inspect the TP sensor. (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the throttle body, then go to Step 6. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P2138[L3 WITH TC]

id010239812200

DTC P2138	APP sensor No.1/No.2 voltage correlation problem
DETECTION CONDITION	• The PCM compares the input voltage from APP sensor No.1 with the input voltage from APP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is an APP sensor No.1/No.2 angle correlation problem. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• APP sensor No.1 malfunction • APP sensor No.2 malfunction • Connector or terminal malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the APP sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	**INSPECT APP SENSOR** • Inspect the APP sensor. (See01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the APP sensor, then go to Step 6. (See01-13B-18 ACCELERATOR PEDAL REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

DTC P2177[L3 WITH TC]

id010239812300

DTC P2177	Fuel system too lean at off idle
DETECTION CONDITION	• PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed the preprogrammed criteria, the PCM determines that the fuel system is too lean at off-idle. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator malfunction • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line • Exhaust system leakage • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	If misfire the DTC is present, go to Step 8. If other DTCs is present, go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2177 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access the APP1, APP2, ECT, MAF, TP and VSS PIDs using the M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 20.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses repair or replace it. Then go to Step 20.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access the O2S11 for P2177 PID using the M-MDS. • Check the PID under following accelerator pedal condition in NEUTRAL. • Is the PID reading normal? — **–0.1—0.1 A** when idle — Engine speed is **more than 3,000 rpm**. — **More than 0.25 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 20.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 20.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace the source of air suction, then go to Step 20.
		No	Go to the next step.
10	**INSPECT PURGE SOLENOID OPERATION** • Perform the Purge Control System Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 20.
11	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 15.
		No	Go to the next step.
12	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 14.
13	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. • Is fuel leakage found? (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 15.
		No	Replace the fuel delivery pipe, then go to Step 20.
14	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 20.
		No	Go to the next step.
15	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to Step 20.

STEP	INSPECTION		ACTION
16	**INSPECT IGNITION SYSTEM** • Perform the spark test. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result, then go to Step 20.
17	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 20.
18	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect the variable valve timing control system operation. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 20.
19	**INSPECT FUEL INJECTOR OPERATION** • Remove the fuel injector. • Inspect the fuel injector (resistance, injection amount). (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is the fuel injector normal?	Yes	Go to the next step.
		No	Replace the fuel injector, then go to the next step.
20	**VERIFY TROUBLESHOOTING OF DTC P2177 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
21	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2178[L3 WITH TC]

id010239812400

DTC P2178	Fuel system too rich at off idle
DETECTION CONDITION	• PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed the preprogrammed criteria, the PCM determines that fuel system is too rich at off-idle. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator malfunction • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • EGR valve improper operation • Variable swirl control improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • PCV valve malfunction • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	If misfire the DTC is present, go to Step 8. If other DTCs is present, go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2178 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access the APP1, APP2, ECT, MAF, TP and VSS PIDs using the M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 19.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 19.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access the O2S11 for P2177 PID using the M-MDS. • Check the PID under following accelerator pedal condition in NEUTRAL. • Is the PID reading normal? — **–0.1—0.1 A** when idle — Engine speed is **more than 3,000 rpm**. — **More than 0.25 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 19.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2 • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 19.
9	**INSPECT PURGE SOLENOID OPERATION** • Perform the Purge Control System Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 19.
10	**INSPECT PCV VALVE OPERATION** • Inspect the PCV valve operation. (See01-16B-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[L3 WITH TC].) • Is the PCV valve normal?	Yes	Go to the next step.
		No	Replace the PCV valve, then go to Step 19
11	**INSPECT EGR VALVE OPERATION** • Perform the EGR Control System Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the EGR control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 19.
12	**INSPECT VARIABLE SWIRL CONTROL OPERATION** • Perform the Variable Swirl Control Operation Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable swirl control work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 19.
13	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect the variable valve timing control system operation. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 19.
14	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 18.
		No	Go to the next step.

STEP	INSPECTION		ACTION
15	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 17.
16	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the fuel delivery pipe, then go to Step 19.
17	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 19.
		No	Go to the next step.
18	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to the next step.
19	**VERIFY TROUBLESHOOTING OF DTC P2178 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
20	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2187[L3 WITH TC]

id010239812500

DTC P2187	Fuel system too lean at idle
DETECTION CONDITION	• PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed the preprogrammed criteria, the PCM determines that fuel system is too lean at idle. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator malfunction • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Exhaust system leakage • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Air suction in intake-air system • Insufficient engine compression • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	If misfire DTC is present, go to Step 8. If other DTC is present, go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2177 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access the APP1, APP2, ECT, MAF and TP PIDs using the M-MDS.) • Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair if necessary. Then go to Step 20.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 4 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 20.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access the O2S11 for P2177 PID using the M-MDS. • Check the PID under following accelerator pedal condition in NEUTRAL. • Is the PID reading normal? — **–0.1—0.1 A** when idle — Engine speed is **more than 3,000 rpm**. — **More than 0.25 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. Then go to Step 20.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 20.
9	**INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM** • Visually inspect for loosen, cracks or damages hoses on intake-air system. • Is there any malfunction?	Yes	Repair or replace the source of air suction, then go to Step 20.
		No	Go to the next step.
10	**INSPECT PURGE SOLENOID VALVE STUCK OPEN** • Turn the ignition switch to off. • Disconnect the both hoses from purge solenoid valve. • Blow the air through purge solenoid valve. • Does the air blow through?	Yes	Replace the purge solenoid valve. Then go to Step 20.
		No	Go to the next step.
11	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 15.
		No	Go to the next step.
12	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 14.
13	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 15.
		No	Replace the fuel delivery pipe, then go to Step 20.
14	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 20.
		No	Go to the next step.

STEP	INSPECTION		ACTION
15	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to Step 20.
16	**INSPECT IGNITION SYSTEM** • Perform the spark test. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test results, then go to Step 20.
17	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) • Is it normal?	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 20.
18	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect the variable valve timing control system operation. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 20.
19	**INSPECT FUEL INJECTOR OPERATION** • Remove the fuel injector. • Inspect the fuel injector (resistance, injection amount). (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is the fuel injector normal?	Yes	Go to the next step.
		No	Replace the fuel injector, then go to the next step.
20	**VERIFY TROUBLESHOOTING OF DTC P2187 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
21	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2188[L3 WITH TC]

id010239812600

DTC P2188	Fuel system too rich at idle
DETECTION CONDITION	• PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed the preprogrammed criteria, the PCM determines that fuel system is too rich at idle. **Diagnostic support note** • This is a continuous monitor. (Fuel system) • MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • MAF sensor malfunction • Pressure regulator malfunction • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Fuel pump malfunction • EGR valve stuck open • Variable swirl control improper operation • Purge solenoid valve improper operation • Purge solenoid valve malfunction (stuck open) • Purge solenoid hoses improper connection • PCV valve malfunction • Variable valve timing control system improper operation • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to off, then to the ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	If misfire the DTC is present, go to Step 8. If other DTCs is present, go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	If driveability concern is present, go to Step 8. If not, go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2178 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	**VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/ IDLE)** • Access the APP1, APP2, ECT, MAF, TP and VSS PIDs using the M-MDS. • Is there any signal that is far out of specification when the ignition switch is at the ON position and engine runs?	Yes	Inspect the sensor and excessive resistance in related wiring harnesses. Repair or if necessary. Then go to Step 19.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION** • Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the sensor and related wiring harnesses, repair or replace it. Then go to Step 19.
		No	Go to the next step.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S** • Access the O2S11 for P2177 PID using the M-MDS. • Check the PID under following accelerator pedal condition in NEUTRAL. • Is the PID reading normal? — **–0.1—0.1 A** when idle — Engine speed is **more than 3,000 rpm.** — **More than 0.25 mA** just after release of accelerator pedal (lean condition).	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S. Then go to Step 19.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 19.
9	**INSPECT PURGE SOLENOID OPERATION** • Perform the Purge Control System Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the purge control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 19.
10	**INSPECT PCV VALVE OPERATION** • Inspect the PCV valve operation. (See01-16B-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[L3 WITH TC].) • Is the PCV valve normal?	Yes	Go to the next step.
		No	Replace the PCV valve, then go to Step 19.
11	**INSPECT VARIABLE SWIRL CONTROL OPERATION** • Perform the Variable Swirl Control Operation Inspection. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable swirl control work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 19.
12	**INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Inspect the variable valve timing control system operation. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 18.
13	**INSPECT IF EGR VALVE IS STUCK OPEN** • Remove the EGR valve. • Does the EGR valve stuck open?	Yes	Clean or replace the EGR valve, then go to Step 19.
		No	Go to the next step.
14	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 18.
		No	Go to the next step.
15	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 17.

STEP	INSPECTION		ACTION
16	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 19.
		No	Replace the fuel delivery pipe, then go to Step 19.
17	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 19.
		No	Go to the next step.
18	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to the next step.
19	**VERIFY TROUBLESHOOTING OF DTC P2188 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adaptive Memory Produce Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
20	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2195[L3 WITH TC]

id010239812700

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	• The PCM monitors the front HO2S output when the following conditions are met. If the output is **more than 1.15 A for 25 s**, the PCM determines that the front HO2S has a malfunction. **MONITORING CONDITION** — ECT: more than **70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — Charging efficiency: **20—62.5%** — Output voltage from the rear HO2S: **0.2 V or above** **Diagnostic support note** • This is an intermittent monitor (HO2S). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Insufficient fuel line pressure • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Exhaust gas leakage • Air suction at intake-air system malfunction • Fuel leakage • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch to off, then to ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2195 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — APP1 — APP2 — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 16.

STEP	INSPECTION		ACTION
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under FREEZE FRAME DATA condition. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — APP1 — APP2 — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 16.
7	**INSPECT INTAKE-AIR SYSTEM FOR EXCESSIVE AIR SUCTION** • Visually inspect for loosen, cracks or damages hose in intake-air system. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part, then go to Step 16.
		No	Go to the next step.
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 16.
9	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 16. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**INSPECT FUEL INJECTOR** • Inspect the fuel injector. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 16. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FUEL_PRES PID. • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 15.
		No	Go to the next step.
12	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 14.
13	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 15.
		No	Replace the fuel delivery pipe, then go to Step 16.
14	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 16.
		No	Go to the next step.

STEP	INSPECTION		ACTION
15	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) • Measure the low side fuel pressure. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to the next step.
16	**VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
17	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2196[L3 WITH TC]

id010239812800

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	• The PCM monitors the front HO2S output when the following conditions are met. If the output is **less than 0.85 for 25 s**, the PCM determines that the front HO2S has a malfunction. **MONITORING CONDITION** — ECT: **more than 70 °C {158 °F}** — Engine speed: **1,000—3,200 rpm** — Charging efficiency: **20—62.5%** — Output voltage from the rear HO2S: **0.7 V or less** **Diagnostic support note** • This is an intermittent monitor (HO2S). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Fuel injector malfunction • Excessive fuel pressure • Fuel pressure sensor malfunction • Relief valve (built-in fuel delivery pipe) malfunction • Spill valve control solenoid valve (built-in high pressure fuel pump) malfunction • High pressure fuel pump malfunction • Restriction in intake-air system • MAF sensor malfunction • ECT sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch to off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs. • Is the DTC P2177 or P2187 also present?	Yes	Go to the appropriate DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2196 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**VERIFY CURRENT INPUT SIGNAL STATUS** • Connect the M-MDS to the DLC-2. • Verify the following PIDs. (See01-40B-7 PCM INSPECTION[L3 WITH TC].) — APP1 — APP2 — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 15.
6	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION** • Connect the M-MDS to the DLC-2. • Verify the following PIDs under the FREEZE FRAME DATA condition. — APP1 — APP2 — ECT — MAF — TP — VSS • Are the PIDs normal?	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 15.
7	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Connect the M-MDS to the DLC-2. • Start the engine. • Access the MAF PID. • Verify that the MAF PID changes quickly according to engine speed. • Is the PID normal?	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 15.
8	**INSPECT FRONT HO2S** • Inspect the front HO2S. (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the front HO2S, then go to Step 15. (See01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**INSPECT FUEL INJECTOR** • Inspect the fuel injector. (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) • Is there any malfunction?	Yes	Replace the suspected fuel injector, then go to Step 15. (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Access and monitor FRP PID. • Is the FRP PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 14.
		No	Go to the next step.
11	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 16.
12	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) • Is the fuel pressure sensor normal?	Yes	Go to Step 14.
		No	Replace the fuel delivery pipe, then go to Step 15.
13	**INSPECT HIGH PRESSURE FUEL PUMP** • Replace the high pressure fuel pump • Monitor FUEL_PRES PID • Is the FUEL_PRES PID value within the specified? (See01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 15.
		No	Go to the next step.
14	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) • Is the low side fuel pressure within the specified?	Yes	Go to the next step.
		No	Inspect for following: • Fuel line restriction • Fuel filter clogging If okay replace the fuel pump. Then go to the next step.
15	**VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
16	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2228[L3 WITH TC]

id010239812900

DTC P2228	BARO sensor circuit low input
DETECTION CONDITION	• PCM monitors the input voltage from the BARO sensor. If the input voltage at the PCM is **below 1.95 V**, the PCM determines that the BARO sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BARO SENSOR MALFUNCTION** • Start the engine. • Access the BARO PID using the M-MDS. • Inspect that the BARO PID is within the specification. • Is there any malfunction?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2229[L3 WITH TC]

id010239813000

DTC P2229	BARO sensor circuit high input
DETECTION CONDITION	• PCM monitors the input voltage from the BARO sensor. If the input voltage at the PCM is **above 4.45 V**, the PCM determines that the BARO sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• BARO sensor malfunction • PCM malfunction

Diagnostic procedure

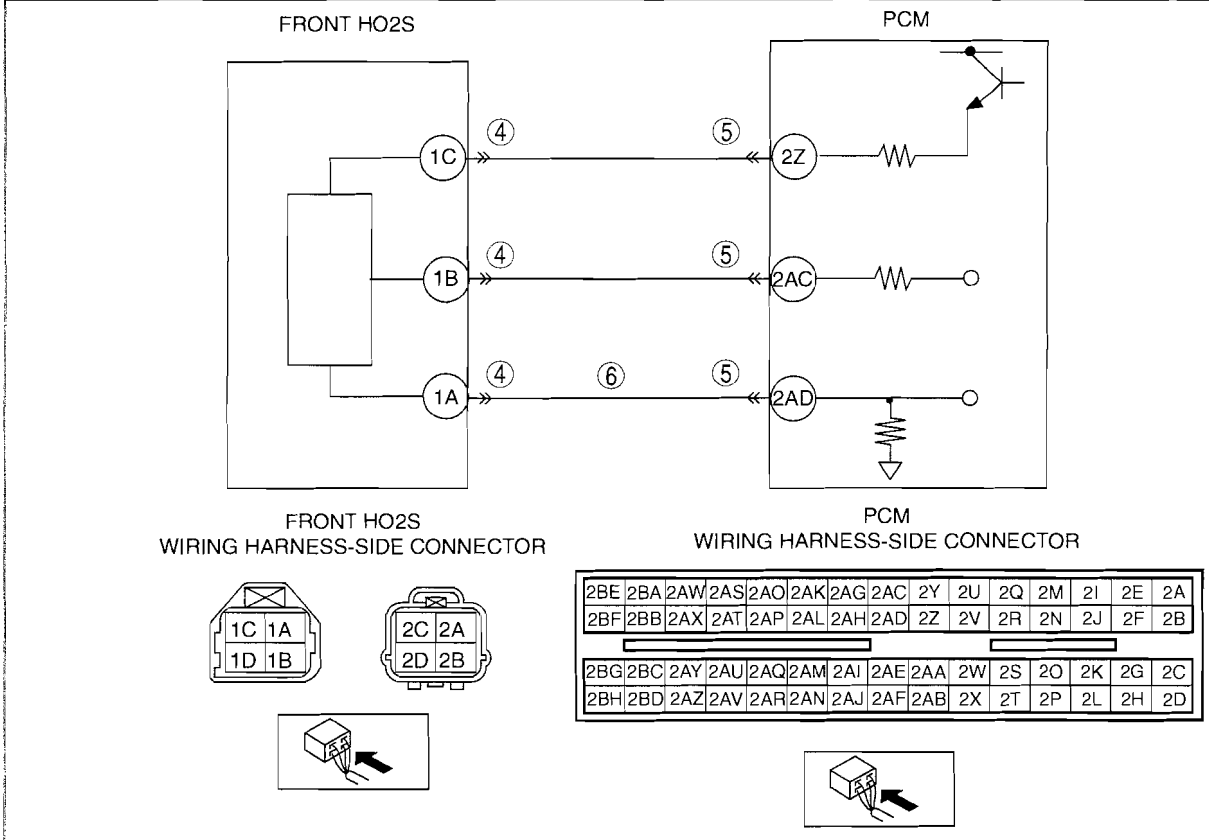
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BARO SENSOR MALFUNCTION** • Start the engine. • Access the BARO PID using the M-MDS. • Inspect that the BARO PID is within the specification. • Is there any malfunction?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the memory using the M-MDS. • Start engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2237[L3 WITH TC]

id010239813100

DTC P2237	Front HO2S positive current control circuit open
DETECTION CONDITION	• The PCM monitors the front HO2S positive current control circuit voltage. If the voltage does not change with the PCM control value while the engine is running, the PCM determines that the front HO2S positive current control circuit is open. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2AD and front HO2S terminal 1A • PCM malfunction

DTC P2237	Front HO2S positive current control circuit open



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2237 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
4	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step.
		No	Go to the next step.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step.
		No	Go to the next step.

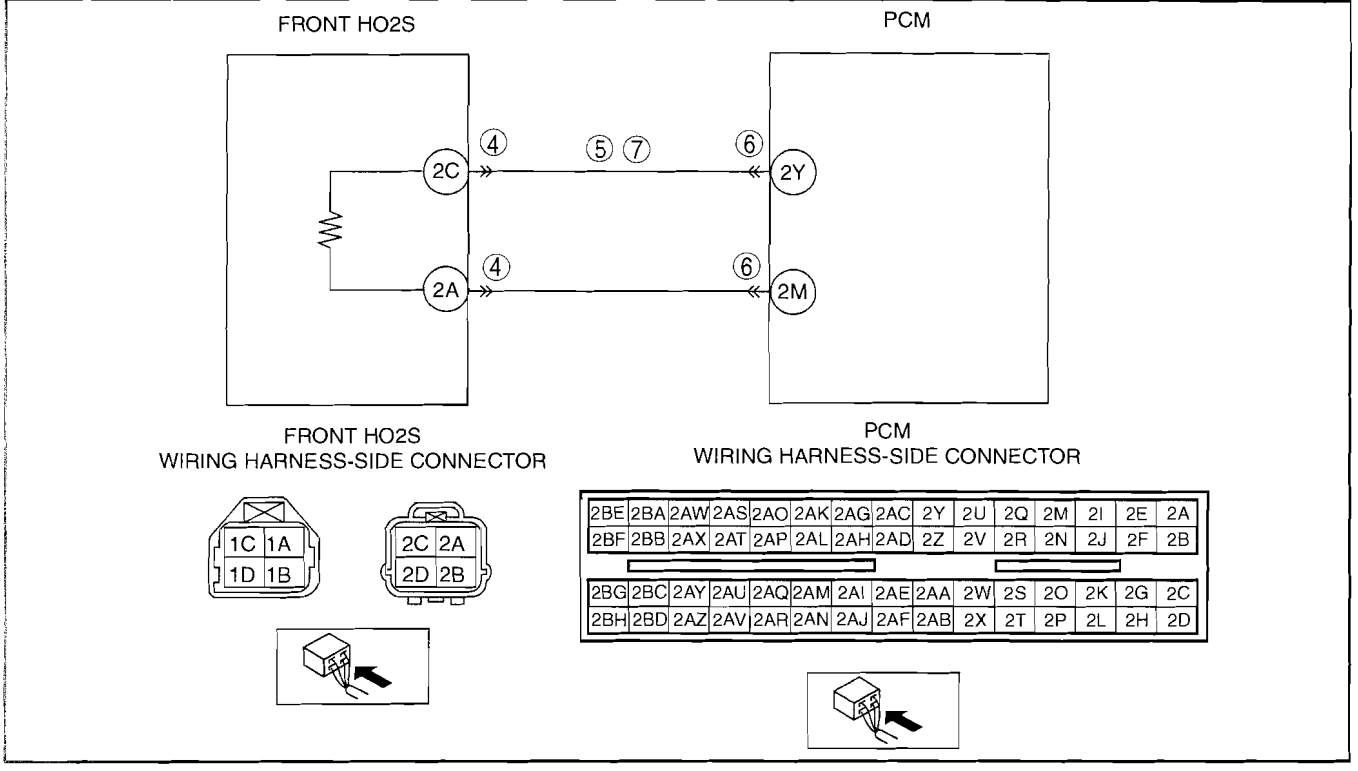
STEP	INSPECTION		ACTION
6	**INSPECT FRONT HO2S POSITIVE CURRENT CIRCUIT FOR OPEN AT PCM - FRONT HO2S** • Front HO2S and PCM connectors disconnected. • Verify the continuity between PCM terminal 2AD and front HO2S terminal 1A. • Is there continuity?	Yes	Replace the front HO2S, then go to the next step.
		No	Repair or replace the wiring harness for an open, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2237 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2245[L3 WITH TC]

id010239813200

DTC P2245	Front HO2S sensor reference voltage circuit low input
DETECTION CONDITION	• The PCM monitors is front HO2S sensor reference voltage circuit voltage. If the voltage below the threshold value while the engine is running, the PCM determines that the front HO2S sensor reference voltage circuit is low. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to ground circuit between PCM terminal 2Y and front HO2S sensor terminal 2C • PCM malfunction

DTC P2245	Front HO2S sensor reference voltage circuit low input



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2245 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
4	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
5	**INSPECT FRONT HO2S REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND AT FRONT HO2S** • Turn the ignition switch to the off. • Front HO2S connector disconnected. • Inspect the continuity between front HO2S terminal 2C (part-side) and ground. • Is there continuity?	Yes	Replace the front HO2S, then go to Step 8.
		No	Go to the next step.

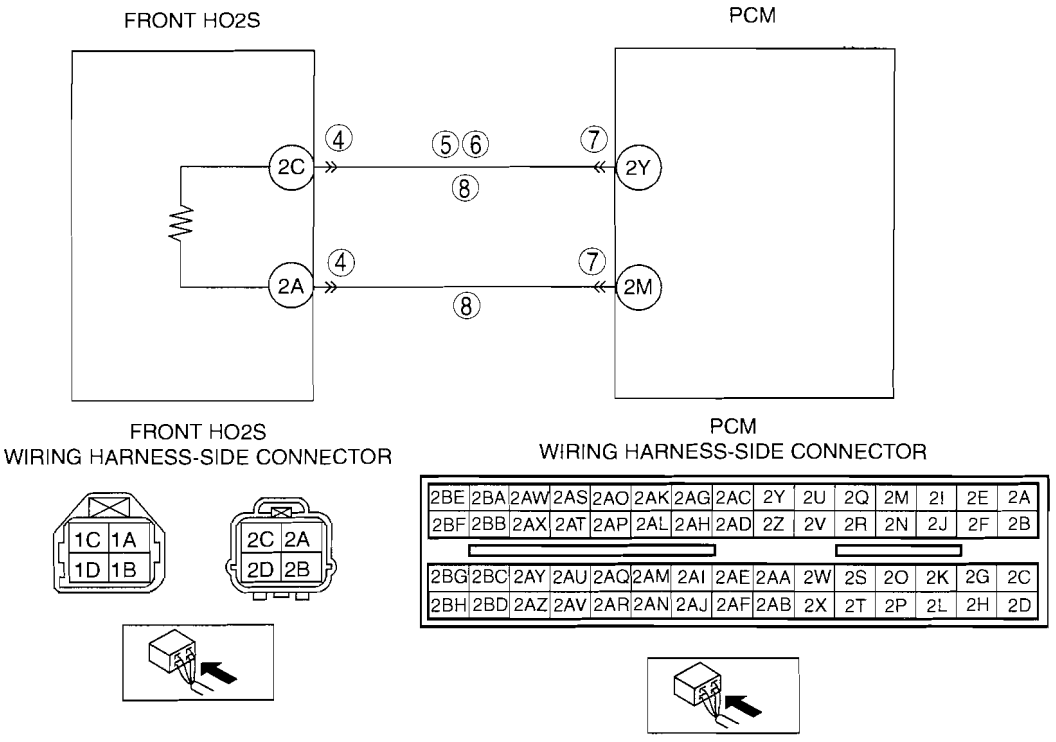
STEP	INSPECTION		ACTION
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT FRONT HO2S REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND AT PCM - FRONT HO2S** • Turn the ignition switch to the off. • Front HO2S and PCM connectors disconnected. • Inspect the continuity between front HO2S terminal 2C (harness-side) and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground between PCM terminal 2Y and front HO2S sensor terminal 2C, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2245 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2246[L3 WITH TC]

id010239813300

DTC P2246	Front HO2S sensor reference voltage circuit high input
DETECTION CONDITION	• The PCM monitors the front HO2S sensor reference voltage circuit voltage. If the voltage is above the threshold value while the engine is running, the PCM determines that the front HO2S sensor reference voltage circuit is high. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Short to the power circuit between PCM terminal 2Y and front HO2S terminal 2C • Open circuit between PCM terminal 2Y and front HO2S terminal 2C • Open circuit between PCM terminal 2M and front HO2S terminal 2A • PCM malfunction

DTC P2246	Front HO2S sensor reference voltage circuit high input



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2246 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
4	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
5	**INSPECT FRONT HO2S REFERENCE VOLTAGE CIRCUIT FOR SHORT TO POWER AT FRONT HO2S** • Front HO2S connector disconnected. • Turn the ignition switch to the ON position (engine off). • Measure the voltage between front HO2S terminal 2C (part-side) and ground. • Is the voltage **above 5.0 V**?	Yes	Replace the front HO2S, then go to Step 9.
		No	Go to the next step.

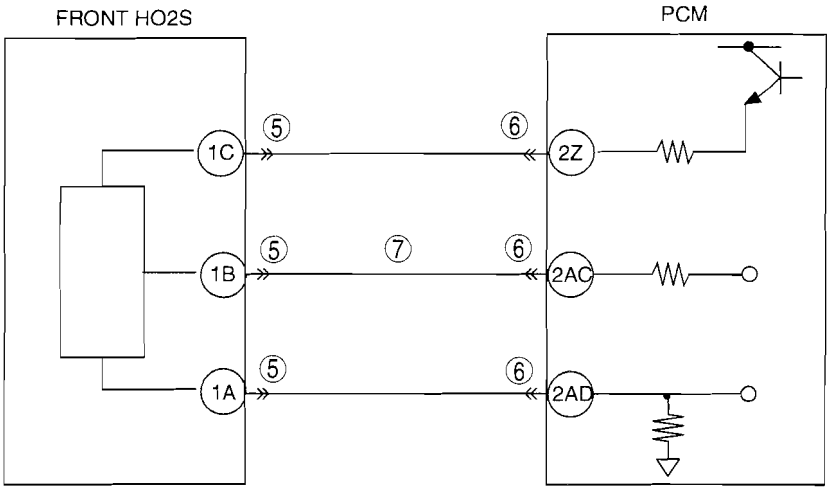
STEP	INSPECTION		ACTION
6	**INSPECT FRONT HO2S REFERENCE VOLTAGE CIRCUIT FOR SHORT TO POWER AT PCM - FRONT HO2S** • Front HO2S connector disconnected. • Turn the ignition switch to the ON position (engine off). • Measure the voltage between front HO2S terminal 2C (harness-side) and ground. • Is the voltage **above 5.0 V**?	Yes	Repair or replace for a short to power, then go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	**INSPECT FRONT HO2S REFERENCE VOLTAGE CIRCUIT FOR OPEN AT PCM - FRONT HO2S** • Front HO2S and PCM connectors disconnected. • Verify the continuity between following terminals at harness-side connectors. — PCM terminal 2Y—front HO2S terminal 2C — PCM terminal 2M—front HO2S terminal 2A • Is there continuity?	Yes	Replace the front HO2S, then go to the next step.
		No	Repair or replace for an open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P2246 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S and TWC Repair Verification Drive Mode. (See 01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2251[L3 WITH TC]

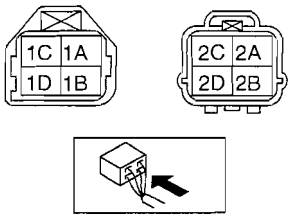
id010239813400

DTC P2251	Front HO2S negative current control circuit open
DETECTION CONDITION	• The PCM monitors the front HO2S negative current control circuit voltage. If the voltage does not change with the PCM control value while the engine is running, the PCM determines that the front HO2S negative current control circuit is open. **Diagnostic support note** • This is a continuous monitor (HO2S). • The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Front HO2S malfunction • Connector or terminal malfunction • Open circuit between PCM terminal 2AC and front HO2S terminal 1B • Front HO2S heater cannot be controlled • PCM malfunction

DTC P2251	Front HO2S negative current control circuit open



FRONT HO2S
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch to off, then ON position (Engine off). • Verify the related PENDING CODE or stored DTCs using the M-MDS. • Is the DTC P0030, P0031 or P0032 also present?	Yes	Go to appropriate DTC troubleshooting procedure. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
4	**IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is DTC P2251 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA. (See01-02B-14 DTC TABLE[L3 WITH TC].)
5	**INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.

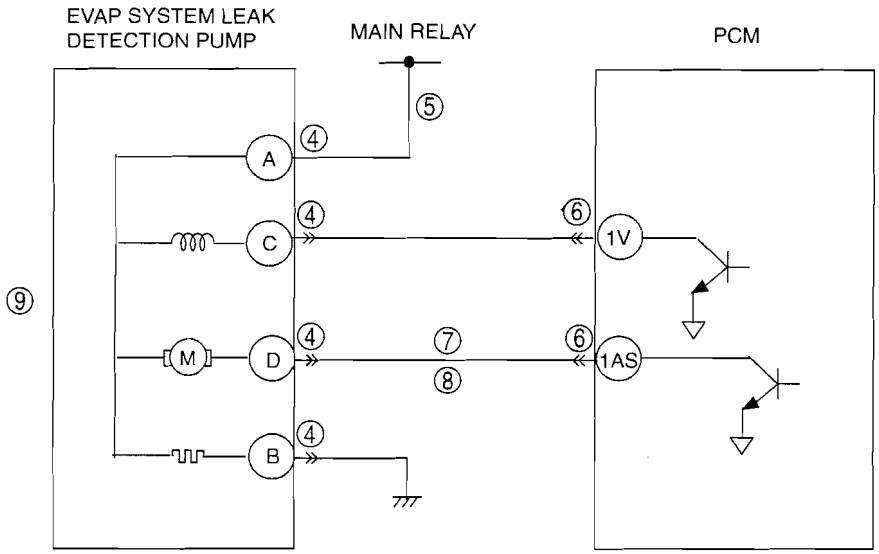
STEP	INSPECTION		ACTION
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	**INSPECT FRONT HO2S NEGATIVE CURRENT CONTROL CIRCUIT FOR OPEN AT PCM - FRONT HO2S** • The front HO2S and the PCM connectors disconnected. • Verify the continuity between the PCM terminal 2AC and the front HO2S terminal 1B at harness-side connectors. • Is there continuity?	Yes	Replace the front HO2S, then go to the next step.
		No	Repair or replace for open circuit, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2251 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the HO2S heater, HO2S and TWC Repair Verification Drive Mode. (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) • Is the PENDING CODE same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the AFTER REPAIR PROCEDURE. (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2401[L3 WITH TC]

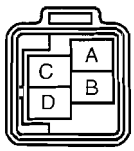
id010239813500

DTC P2401	EVAP system leak detection pump motor circuit low
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the EVAP leak monitor is operating. If the pump load current is lower than specified, the PCM determines that the EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Open circuit between main relay and EVAP system leak detection pump terminal A • Open circuit between EVAP system leak detection pump terminal D and PCM terminal 1AS • Short to ground circuit between EVAP system leak detection pump terminal D and PCM terminal 1AS • Poor connection at the EVAP system leak detection pump or the PCM connector • PCM malfunction

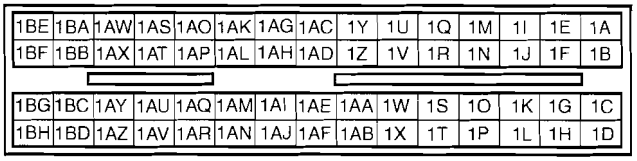
DTC P2401	EVAP system leak detection pump motor circuit low

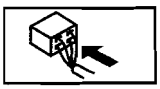


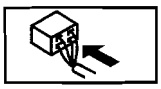
EVAP SYSTEM DETECTION PUMP WIRING HARNESS SIDE CONNECTOR



PCM WIRING HARNESS SIDE CONNECTOR







Diagnostic procedure

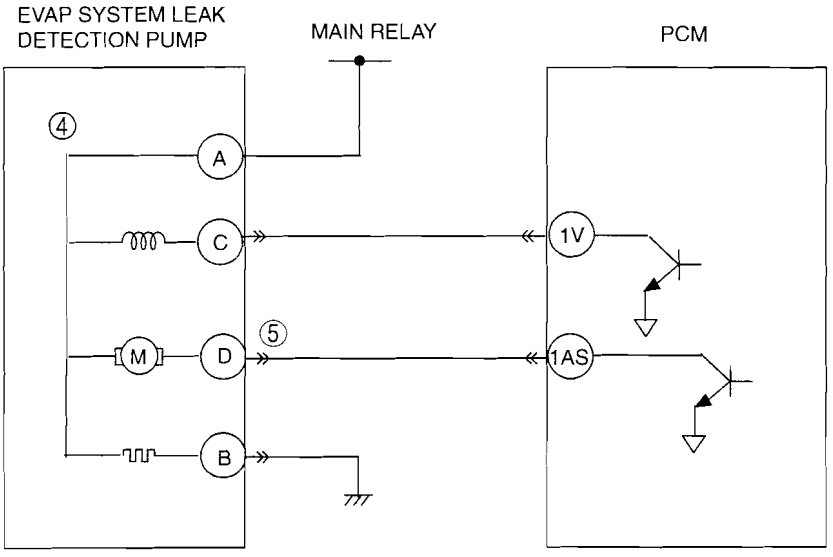
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTC** • Turn the ignition switch to the OFF then ON position (Engine off). • Verify related PENDING CODE or stored DTC. • Is DTC P2405 present?	Yes	Go to appropriate DTC inspection. (See01-02B-258 DTC P2405[L3 WITH TC].)
		No	Go to the next step.
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect EVAP system leak detection pump connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect the main relay. • Inspect continuity between EVAP system leak detection pump terminal A (harness-side) and main relay. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 10.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminal, then go to Step 10.
		No	Go to the next step.
7	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between EVAP system leak detection pump terminal D (harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 10.
		No	Go to the next step.
8	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect continuity between EVAP system leak detection pump terminal D (harness-side) and PCM terminal 1AS (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 10.
9	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Perform the EVAP system leak detection pump inspection. (See01-16B-8 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC].) • Is the EVAP system leak detection pump normal?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If EVAP system test function is not available, take following procedure. — Start the engine and perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

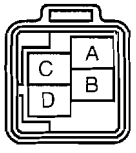
DTC P2402[L3 WITH TC]

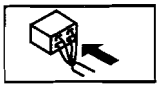
id010239813600

DTC P2402	EVAP system leak detection pump motor circuit high
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the EVAP leak monitor is operating. If the pump load current is higher than specified, the PCM determines that the EVAP system leak detection pump motor circuit has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump malfunction • Short to the power supply between the EVAP system leak detection pump terminal D and PCM terminal 1AS • PCM malfunction



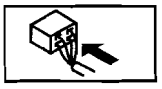
EVAP SYSTEM DETECTION PUMP WIRING HARNESS SIDE CONNECTOR





PCM WIRING HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING CODE OR STORED DTCS** • Turn the ignition switch to the OFF then ON position (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to step 6. (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[L3 WITH TC])
4	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP** • Inspect the EVAP system leak detection pump. (See 01-16B-8 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC]) • Is the EVAP system leak detection pump normal?	Yes	Go to the appropriate DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
5	**CHECK EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position. • Disconnect the EVAP system leak detection pump connector. • Measure the voltage between EVAP system leak detection pump terminal D (harness-side) and body ground. • Is the voltage **B+?**	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If EVAP system test function is not available, take following procedure. — Start the engine and perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2404[L3 WITH TC]

id010239813700

DTC P2404	EVAP system leak detection pump sensor circuit malfunction
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the EVAP leak monitor is operating. After obtaining the reference current value, If the pump load current is greater than or equal to the reference current value plus **1 mA** within the specified time, the PCM determines that the air filter has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• Air filter clogging • EVAP hose bending • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**CHECK EVAP HOSE BENDING** • Inspect the EVAP hose for bending. • Is the EVAP hose normal?	Yes	Go to the next step.
		No	Repair or replace the suspected hose, then go to Step 5.
4	**CHECK AIR FILTER FOR CLOGGING** • Inspect the air filter for clogging. • Is the air filter normal?	Yes	Go to the next step.
		No	Replace the air filter, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If EVAP system test function is not available, take following procedure. — Perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2405[L3 WITH TC]

id010239813800

DTC P2405	EVAP system leak detection pump sensor circuit low input
DETECTION CONDITION	• The PCM monitors the pump load current (EVAP line pressure), while the EVAP leak monitor is operating. If the current is lower than the specification while the PCM obtains the reference current value, the PCM determines that the EVAP system leak detection pump orifice has a malfunction. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump orifice has fallen off • EVAP system leak detection pump motor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If EVAP system test function is not available, take following procedure. — Start the engine and perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2407[L3 WITH TC]

id010239813900

DTC P2407	EVAP system leak detection pump sensor circuit intermittent
DETECTION CONDITION	• The PCM monitors pump the load current (EVAP line pressure), while the EVAP leak monitor is operating. When either of the following is detected**6 times or more successively, the PCM determines that the EVAP system leak detection pump heater has a malfunction:** — While obtaining the reference current value, the change in pump load current exceeds the specification. — After obtaining the reference current value, the pump load current is kept lower than the maximum pump load current for more than the specified time. **Diagnostic support note** • This is a intermittent monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in PCM memory.
POSSIBLE CAUSE	• EVAP system leak detection pump heater malfunction • PCM malfunction

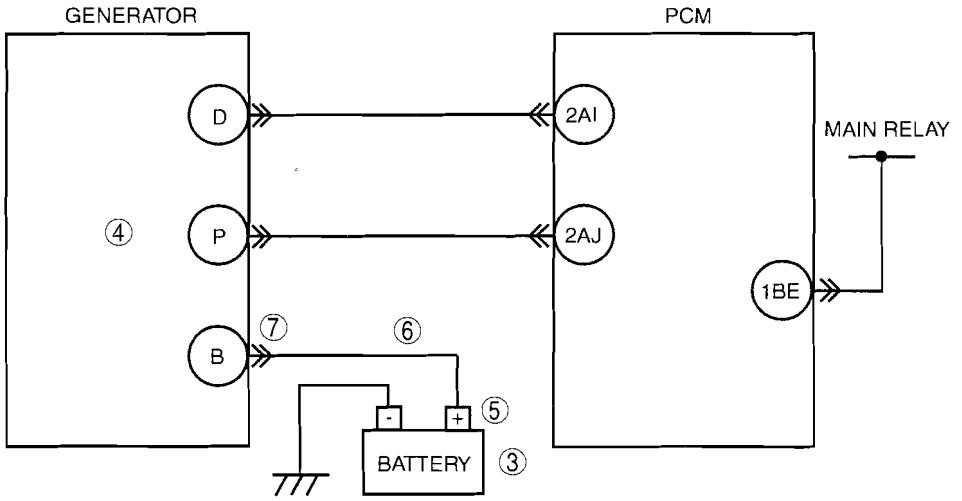
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT EVAP SYSTEM LEAK DETECTION PUMP HEATER** • Perform the EVAP system leak detection pump inspection. (See01-16B-8 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC]) • Is the EVAP system leak detection pump normal?	Yes	Replace the EVAP system leak detection pump, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the EVAP system test using the M-MDS. (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) • Is the same DTC present? **Note** • If EVAP system test function is not available, take following procedure. — Start the engine and perform the "EVAP System Repair Verification Drive Mode". (See01-02B-10 OBD-II DRIVE MODE[L3 WITH TC].) — Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

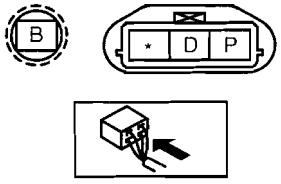
DTC P2502[L3 WITH TC]

id010239814000

DTC P2502	Charging system voltage problem
DETECTION CONDITION	• PCM determines that the generator output voltage is **above 17 V** or the battery voltage is **below 11 V** while the engine is running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Open circuit between generator terminal B and battery positive terminal • Battery malfunction • Generator malfunction • PCM is poorly connected • PCM, generator and/or battery are poorly connected



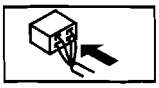
GENERATOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



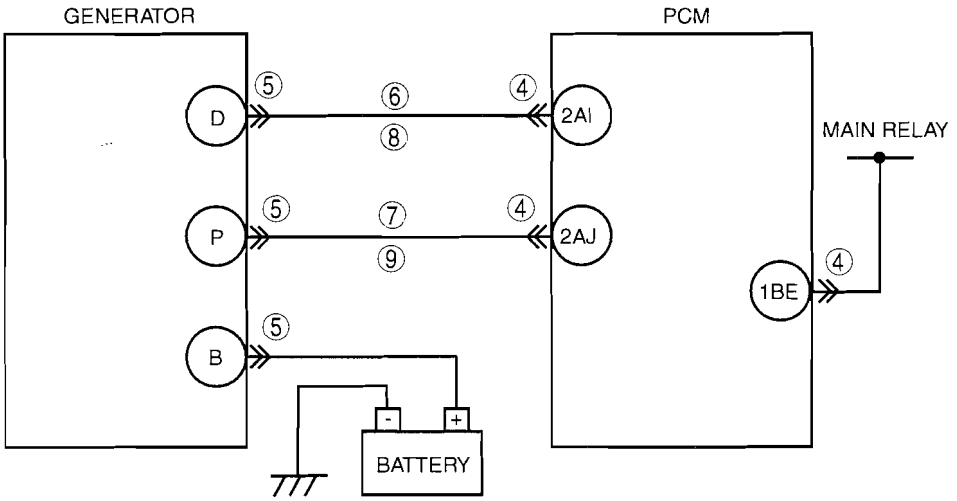
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT BATTERY** • Turn the ignition switch off. • Inspect the battery. • Is the battery normal?	Yes	Go to the next step.
		No	Replace the battery, then go to Step 8.
4	**INSPECT GENERATOR** • Inspect the generator. (See 01-17B-7 GENERATOR INSPECTION[L3 WITH TC]) • Is the generator normal?	Yes	Go to the next step.
		No	Replace the generator, then go to Step 8. (See 01-17B-6 GENERATOR REMOVAL/ INSTALLATION[L3 WITH TC])
5	**INSPECT POOR INSTALLATION OF GENERATOR TERMINAL** • Turn the ignition switch to off. • Inspect for looseness of generator terminal B installation nut. • Is the nut loose?	Yes	Tighten the generator terminal B installation nut, then go to Step 8.
		No	Go to the next step.
6	**INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL** • Inspect for looseness of battery positive terminal. • Is the terminal loose?	Yes	Connect the battery positive terminal correctly, then go to Step 8.
		No	Go to the next step.
7	**INSPECT BATTERY CHARGING CIRCUIT** • Disconnect the generator terminal B. • Measure the voltage between generator terminal B (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between generator terminal B and battery positive terminal, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

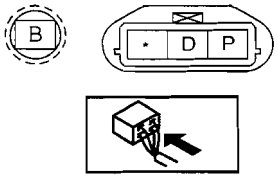
DTC P2503[L3 WITH TC]

id010239814100

DTC P2503	Charging system voltage low
DETECTION CONDITION	• PCM needs **more than 20 A** from the generator, and determines that generator output voltage is **below 8.5 V** while the engine is running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • PCM and/or generator are poorly connected • Open and/or short to ground in the wiring harness from between generator terminal P and PCM terminal 2AJ • Open and/or short to ground in the wiring harness from between generator terminal D and PCM terminal 2AI • Drive chain misadjustment



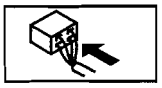
GENERATOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2	



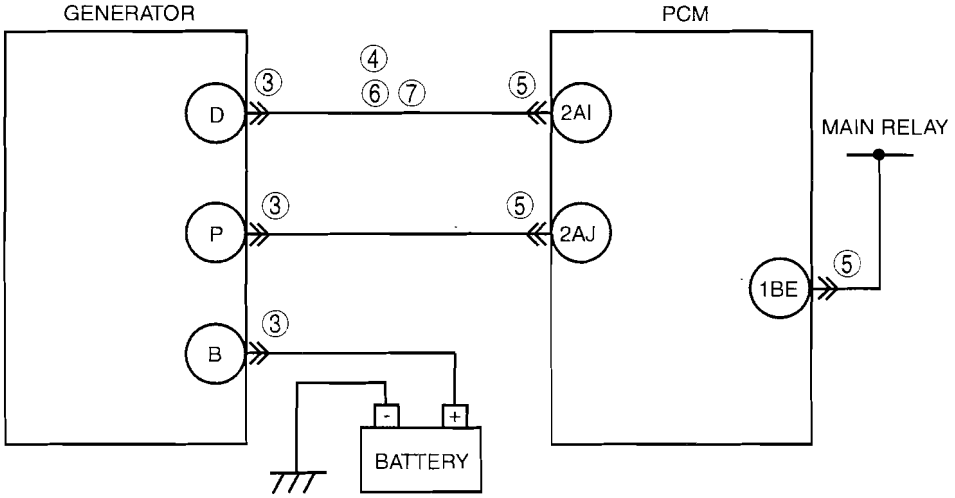
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT DRIVE CHAIN CONDITION** • Verify that the drive chain auto tensioner indicator mark does not exceed limit. • Is the front drive chain normal?	Yes	Go to the next step.
		No	Replace the and/or adjust drive chain, then go to Step 10.
4	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair the terminals, then go to Step 10.
		No	Go to the next step.
5	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Disconnect the generator connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 10.
		No	Go to the next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 10.
		No	Go to the next step.
7	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between generator terminal P (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 10.
		No	Go to the next step.
8	**INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN** • Inspect for continuity between generator terminal D (wiring harness-side) and PCM terminal 2AI (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 10.
9	**INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between generator terminal P (wiring harness-side) and PCM terminal 2AJ (wiring harness-side). • Is there continuity?	Yes	Repair or replace the generator, then go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

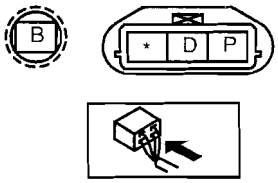
DTC P2504[L3 WITH TC]

id010239814200

DTC P2504	Charging system voltage high
DETECTION CONDITION	• PCM determines that the generator output voltage is **above 18.5 V** or the battery voltage is **above 16.0 V** while the engine is running. **Diagnostic support note** • This is a continuous monitor (Other). • The MIL does not illuminate. • FREEZE FRAME DATA is not available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Short to the power circuit between generator connector terminal D and PCM connector terminal 2AI • Generator malfunction • PCM and/or generator are poorly connected



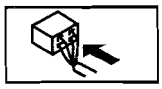
GENERATOR
WIRING HARNESS-SIDE CONNECTOR



PCM
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



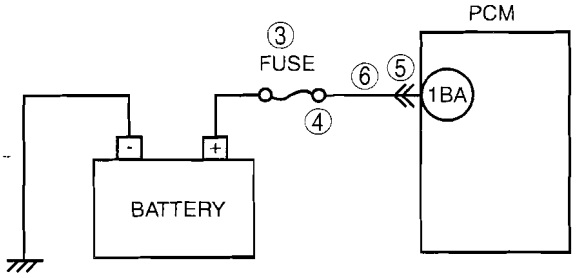
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT GENERATOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the generator connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the terminals, then go to Step 8.
		No	Go to the next step.
4	**CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between generator terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	There is a malfunction at the generator. Go to Step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there any malfunction?	Yes	Repair or replace the pins, then go to Step 8.
		No	Go to the next step.
6	**INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER** • Turn the ignition switch to the ON position (engine off). • Measure the voltage between generator terminal D (wiring harness-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a short to power supply, then go to Step 8.
		No	Go to Step 8.
7	**INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER** • Measure the voltage between generator terminal D (part-side) and body ground. • Is the voltage **B+**?	Yes	Repair or replace the generator, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED** • Make sure to reconnect all connectors. • Clear the DTC from the PCM memory using the M-MDS. • Perform the KOER self-test. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Ares any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2507[L3 WITH TC]

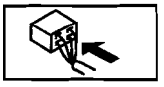
id010239814300

DTC P2507	PCM +BB (back-up battery) voltage low
DETECTION CONDITION	• The PCM monitors the voltage of the back-up battery positive terminal. If the PCM detects that the battery positive terminal voltage is**below 2.5 V for2 s, the PCM determines that the backup voltage circuit has a malfunction.** **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Melt down fuse • Open circuit in the wiring harness between the fuse and PCM terminal 1BA • Short to ground between the fuse and PCM terminal 1BA • Poor connection of the PCM connector. • PCM malfunction



PCM
WIRING HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUSE** • Turn the ignition switch to off. • Inspect the fuse for failure and proper. • Is it normal?	Yes	Go to step 6.
		No	• If the fuse has been melt down, then go to the next step. • If the fuse is not installed correctly, install it correctly then go to Step 7.
4	**INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND** • Disconnect the battery cables. • Inspect for continuity between fuse terminal and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground and install new fuse, then go to Step 7.
		No	Go to step 7.
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair the terminals, then go to Step 7.
		No	Go to the next step.
6	**INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT** • Disconnect the battery cables. • Inspect for continuity between fuse terminal and PCM terminal 1BA (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
7	**VERIFY TROUBLESHOOTING OF DTC P2507 COMPLETED** • Make sure to reconnect all disconnected connectors. • Turn the ignition switch to the ON position (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Start the engine and warm it up completely. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Troubleshooting completed.

DTC P2610[L3 WITH TC]

id010239814400

DTC P2610	PCM internal engine off timer performance
DETECTION CONDITION	• PCM internal engine off timer is damaged. **Diagnostic support note** • This is a continuous monitor (CCM). • MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• PCM internal engine off timer is damaged.

Diagnostic procedure

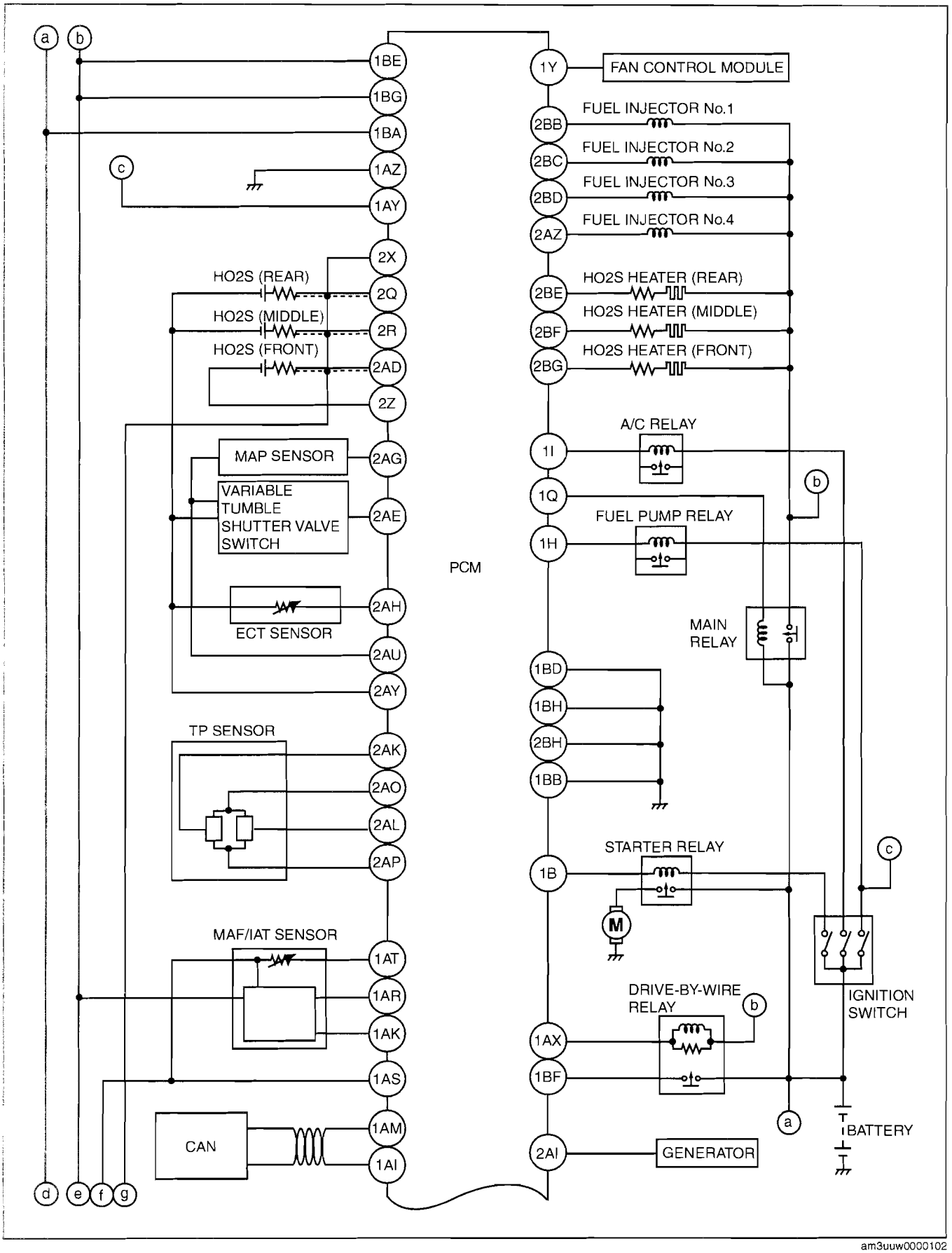
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE BULLETINS AVAILABILITY** • Verify related Service Bulletins availability. • Is any related Service Bulletins available?	Yes	Perform the repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P2610 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. • Start the engine. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See 01-02B-9 AFTER REPAIR PROCEDURE[L3 WITH TC].) • Are any DTCs present?	Yes	Go to the applicable DTC troubleshooting. (See01-02B-14 DTC TABLE[L3 WITH TC].)
		No	DTC troubleshooting completed.

01-03A SYMPTOM TROUBLESHOOTING [LF, L3]

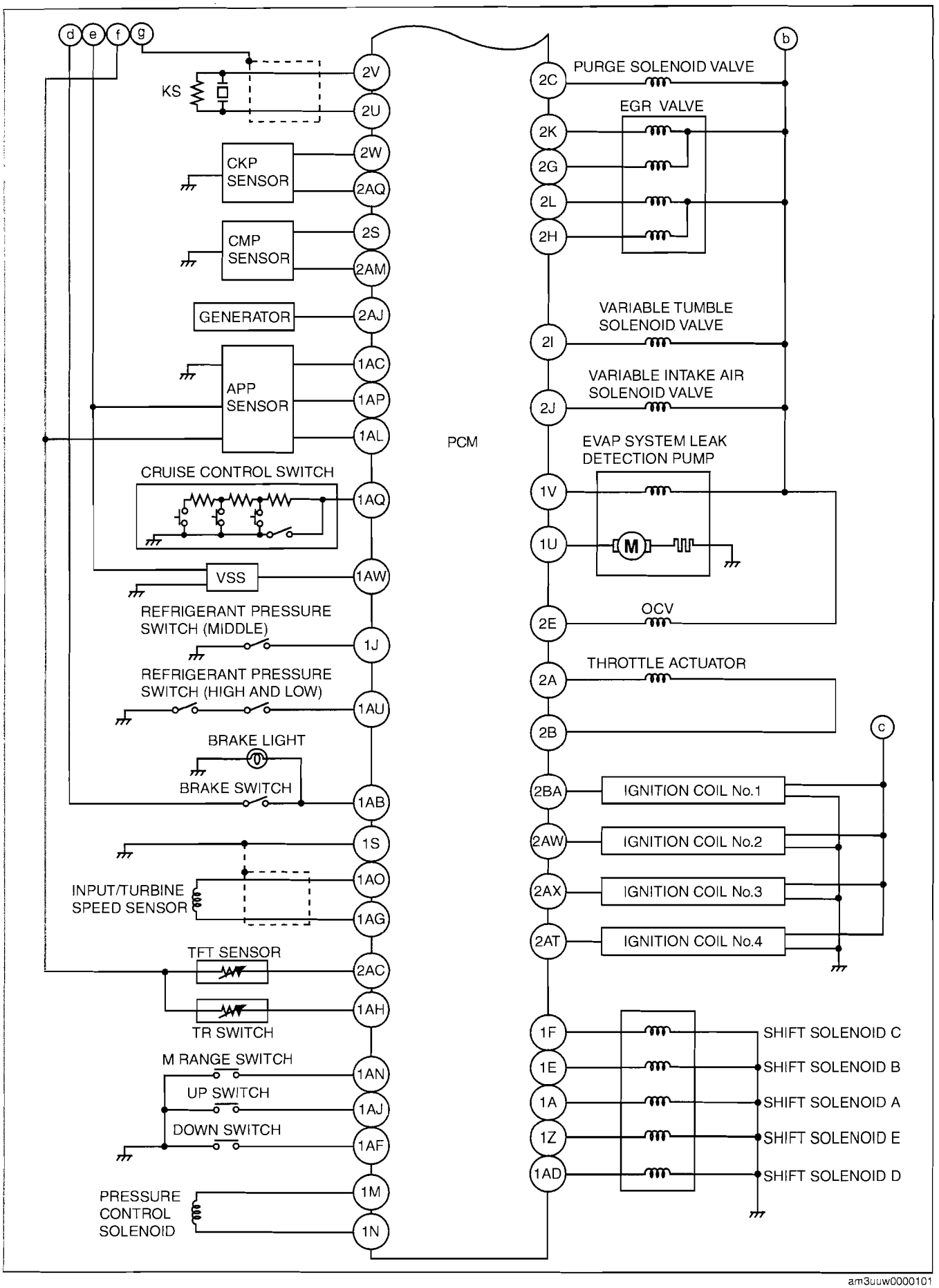
SYMPTOM TROUBLESHOOTING WIRING DIAGRAM[LF, L3]

id0103a6800100

California Emission Regulation Applicable Model with LF ATX

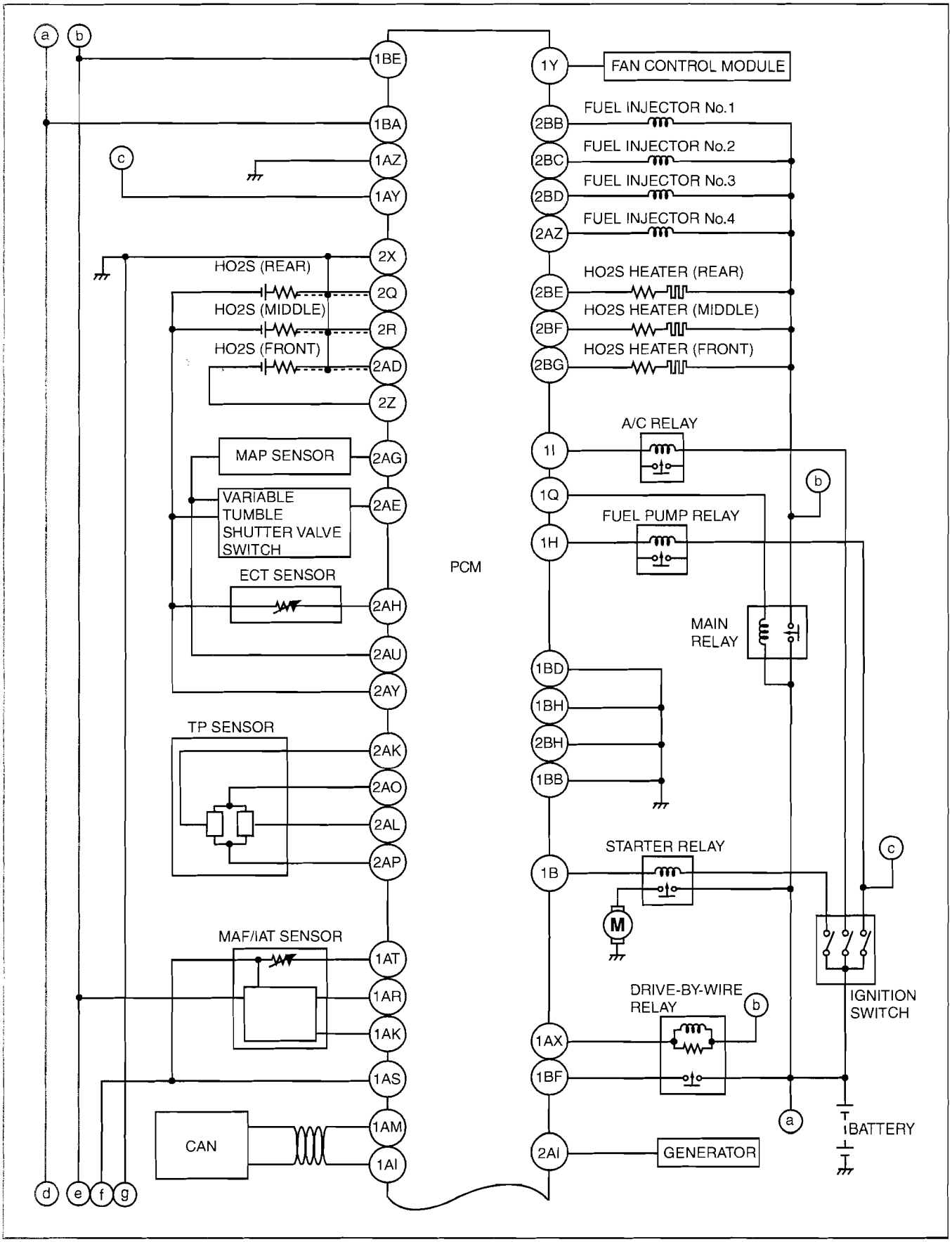


am3uuw0000102

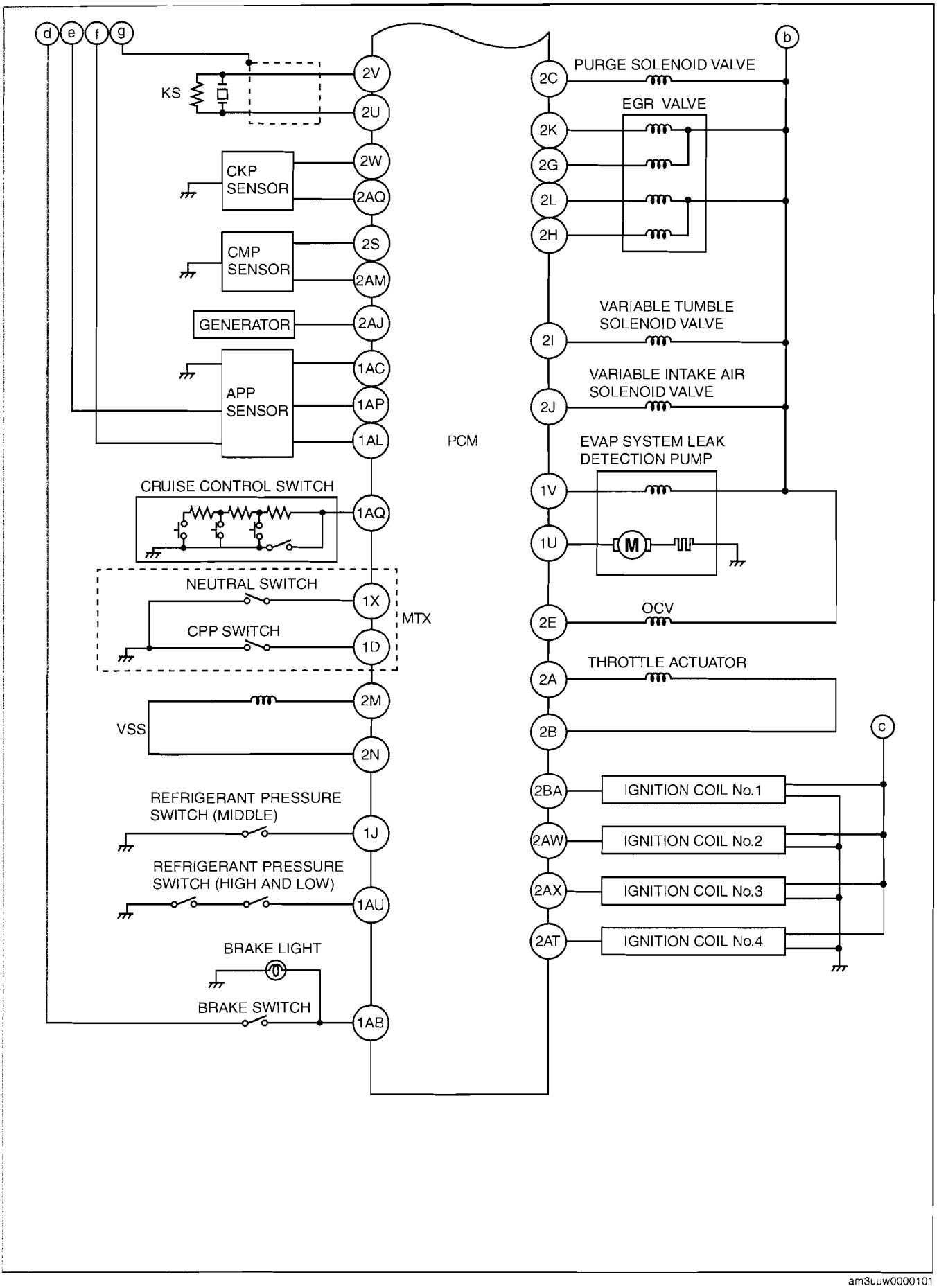


am3uuw0000101

California Emission Regulation Applicable Model with LF MTX, L3

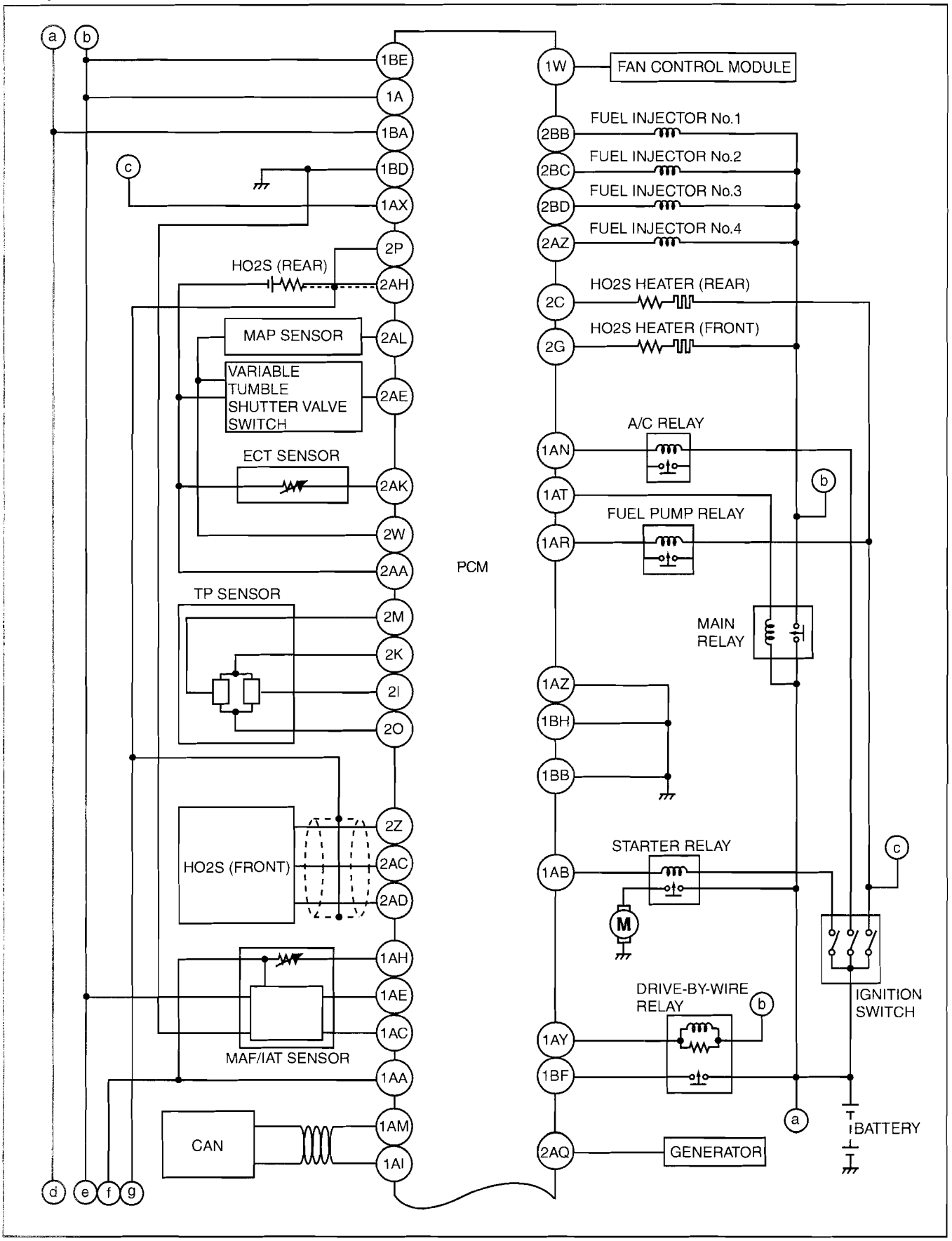


am3uuw0000102

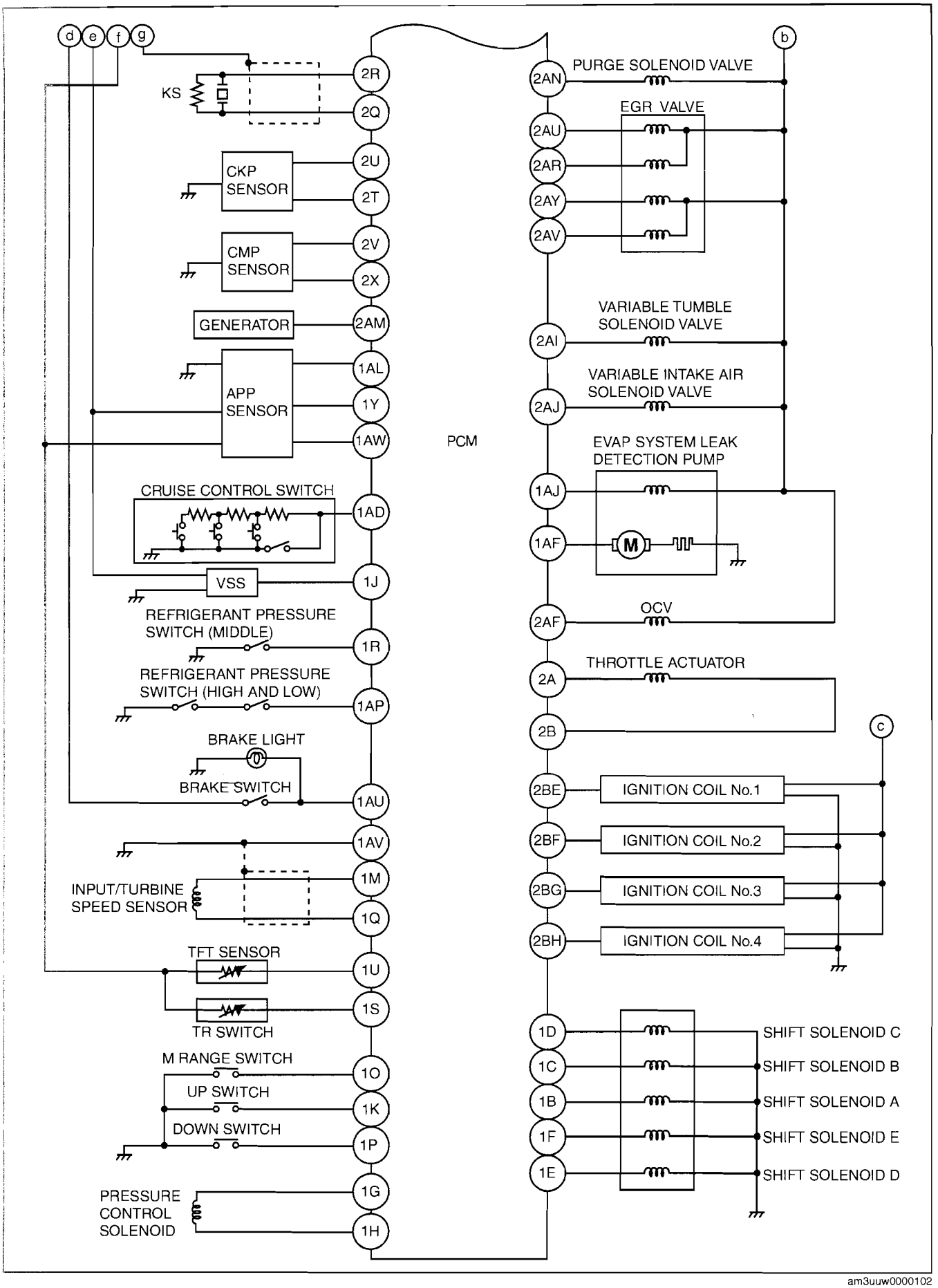


am3uuw0000101

Except for California Emission Regulation Applicable Model with LF ATX

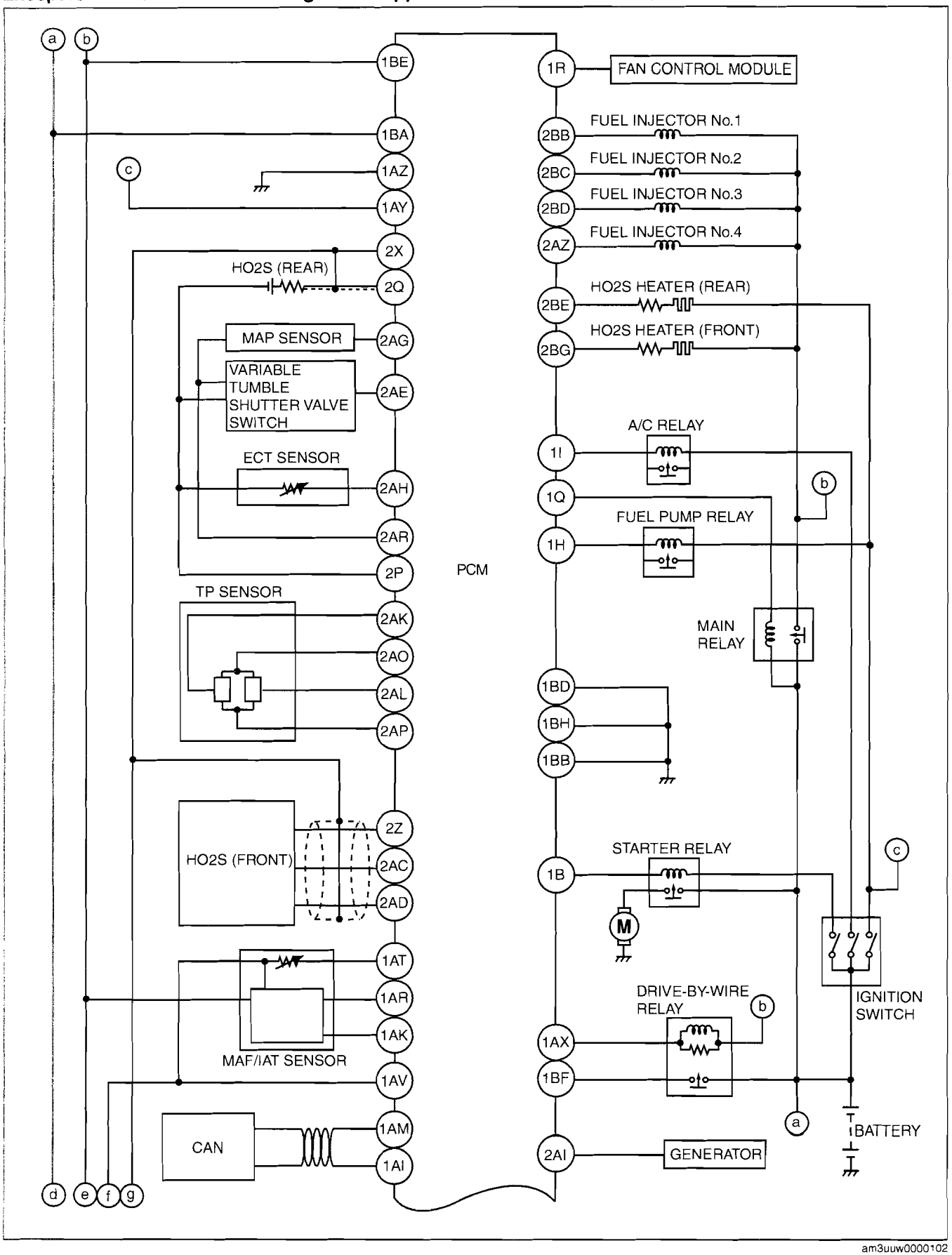


am3uuw0000102

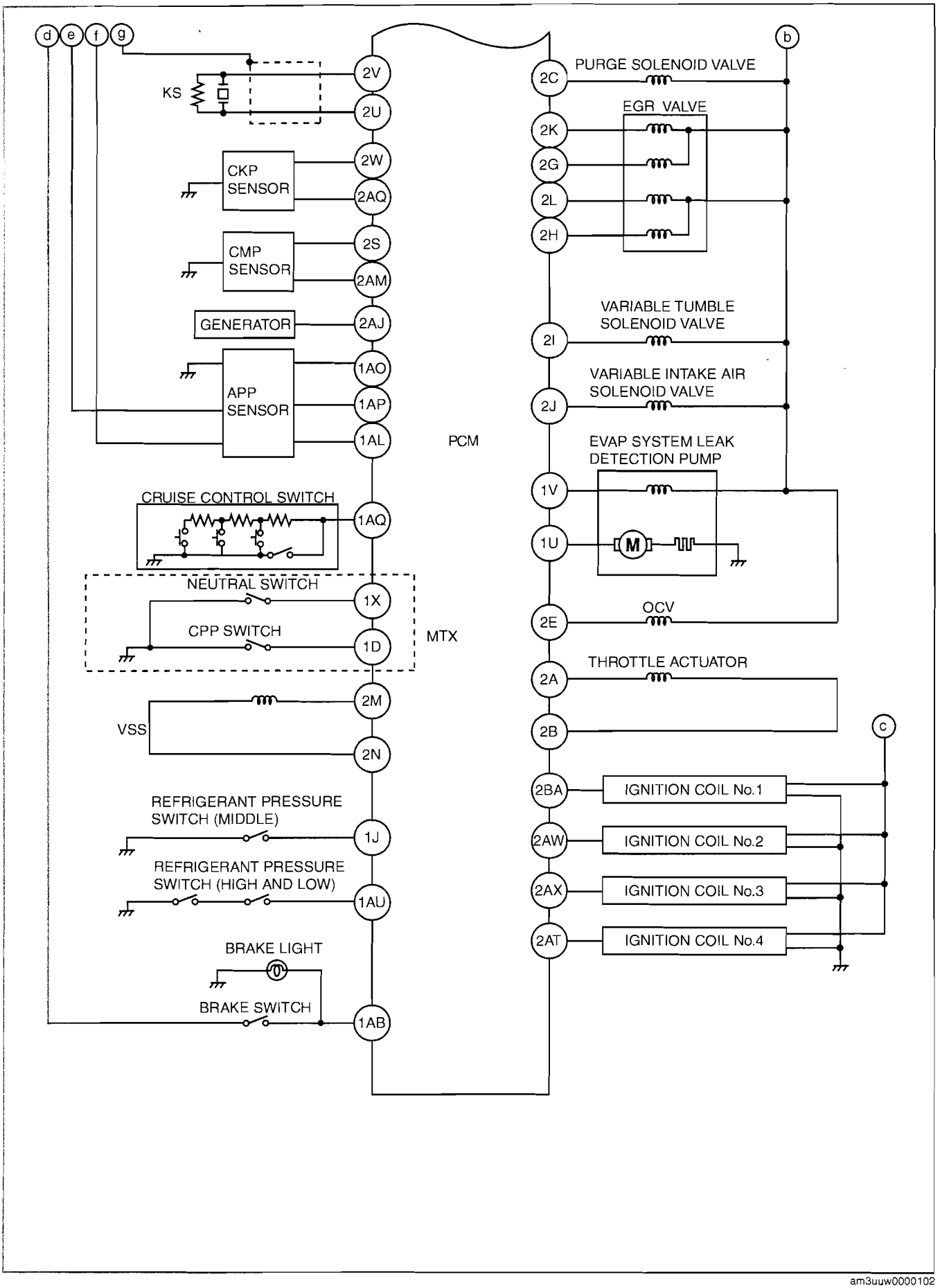


am3uuw0000102

Except for California Emission Regulation Applicable Model with LF MTX, L3



am3uuw0000102

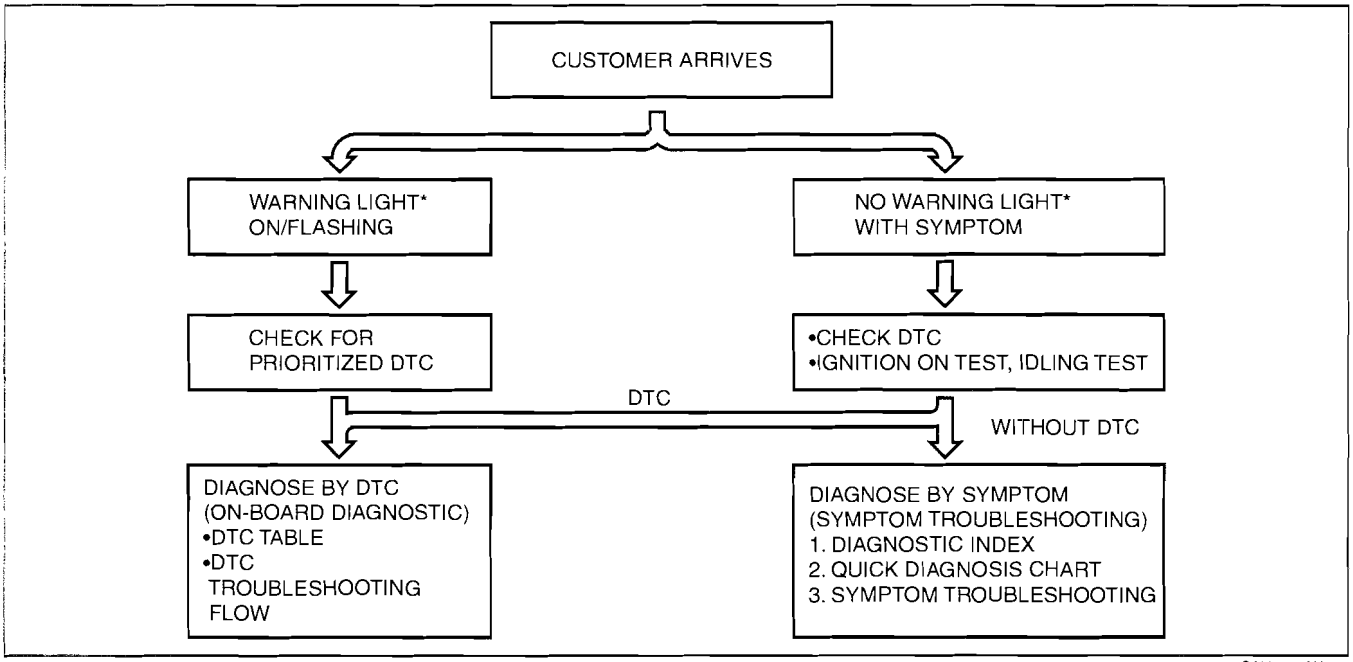


am3uuw0000102

FOREWORD[LF, L3]

id0103a6800300

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart:
  - If a DTC exists, diagnose the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
  - If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03A-13 QUICK DIAGNOSTIC CHART[LF, L3].)



C3U0103W001

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

ENGINE SYMPTOM TROUBLESHOOTING[LF, L3]

id0103a6800500

- Confirm trouble symptom using the following diagnostic index, then go to appropriate troubleshooting chart.

Diagnostic Index

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Melting of main or other fuses		—	(See 01-03A-17 NO.1 MELTING OF MAIN OR OTHER FUSES[LF, L3].)
2	MIL illuminates		The MIL is illuminated incorrectly.	(See 01-03A-18 NO.2 MIL ILLUMINATES[LF, L3].)
3	Will not crank		The starter does not work.	(See 01-03A-19 NO.3 WILL NOT CRANK[LF, L3].)
4	Hard to start/long crank/erratic start/ erratic crank		The starter cranks the engine at normal speed but the engine requires excessive cranking time before starting.	(See 01-03A-21 NO.4 HARD TO START/LONG CRANK/ERRATIC START/ ERRATIC CRANK[LF, L3].)
5	Engine stalls.	After start/at idle	The engine stops unexpectedly at idle and/or after start or both.	(See 01-03A-23 NO.5 ENGINE STALLS-AFTER START/AT IDLE[LF, L3].)
6	Cranks normally but will not start		The starter cranks engine at normal speed but the engine will not run.	(See 01-03A-27 NO.6 CRANKS NORMALLY BUT WILL NOT START[LF, L3].)
7	Slow return to idle		The engine takes more time than normal to return to idle speed.	(See 01-03A-31 NO.7 SLOW RETURN TO IDLE[LF, L3].)
8	Engine runs rough/rolling idle		The engine speed fluctuates between the specified idle speed and lower speed and the engine shakes excessively.	(See 01-03A-32 NO.8 ENGINE RUNS ROUGH/ ROLLING IDLE[LF, L3].)
9	Fast idle/runs on		The engine speed continues at fast idle after warm-up. The engine runs after the ignition switch is turned off.	(See 01-03A-35 NO.9 FAST IDLE/RUNS ON[LF, L3].)
10	Low idle/stalls during deceleration		The engine stops unexpectedly at the beginning of deceleration or recovery from deceleration.	(See 01-03A-36 NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3].)
11	Engine stalls/quits.	Acceleration/cruise	The engine stops unexpectedly at the beginning of acceleration or during acceleration. The engine stops unexpectedly while cruising.	(See 01-03A-37 NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES[LF, L3].)
	Engine runs rough.	Acceleration/cruise	The engine speed fluctuates during acceleration or cruising.	
	Misses	Acceleration/cruise	The engine misses during acceleration or cruising.	
	Buck/jerk	Acceleration/cruise/ deceleration	The vehicle bucks/jerks during acceleration, cruising, or deceleration.	
	Hesitation/stumble	Acceleration	A momentary pause at the beginning of acceleration or during acceleration.	
	Surges	Acceleration/cruise	A momentary minor irregularity in engine output.	
12	Lack/loss of power	Acceleration/cruise	The performance is poor under load (such as power down when climbing hills).	(See 01-03A-42 NO.12 LACK/LOSS OF POWER-ACCELERATION/ CRUISE[LF, L3].)
13	Knocking/pinging	Acceleration/cruise	Sound is produced when the air/fuel mixture is ignited by something other than the spark plug (such as hot spot in combustion chamber).	(See 01-03A-45 NO.13 KNOCKING/PINGING/ DETONATION-ACCELERATION/ CRUISE[LF, L3].)
14	Poor fuel economy		The fuel economy is unsatisfactory.	(See 01-03A-46 NO.14 POOR FUEL ECONOMY[LF, L3].)

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
15	Emission compliance		Fails emissions test.	(See 01-03A-48 NO.15 EMISSION COMPLIANCE[LF, L3].)
16	High oil consumption/leakage		The oil consumption is excessive.	(See 01-03A-50 NO.16 HIGH OIL CONSUMPTION/ LEAKAGE[LF, L3].)
17	Cooling system concerns	Overheating	The engine runs at higher than normal temperature/overheats.	(See 01-03A-50 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[LF, L3].)
18	Cooling system concerns	Runs cold	The engine does not reach normal operating temperature.	(See 01-03A-52 NO.18 COOLING SYSTEM CONCERNS-RUNS COLD[LF, L3].)
19	Exhaust smoke		Blue, black, or white smoke from exhaust system	(See 01-03A-53 NO.19 EXHAUST SMOKE[LF, L3].)
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage	(See 01-03A-55 NO.20 FUEL ODOR (IN ENGINE COMPARTMENT)[LF, L3].)
21	Engine noise		Engine noise from under hood	(See 01-03A-56 NO.21 ENGINE NOISE[LF, L3].)
22	Vibration concerns (engine)		Vibration from under hood or driveline	(See 01-03A-57 NO.22 VIBRATION CONCERNS (ENGINE)[LF, L3].)
23	A/C does not work sufficiently.		The A/C compressor magnetic clutch does not engage when A/C is turned on.	(See 01-03A-58 NO.23 A/C DOES NOT WORK SUFFICIENTLY[LF, L3].)
24	A/C is always on or A/C compressor runs continuously.		The A/C compressor magnetic clutch does not disengage.	(See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].)
25	A/C is not cut off under WOT conditions.		The A/C compressor magnetic clutch does not disengage under wide open throttle.	(See 01-03A-60 NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS[LF, L3].)
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust	(See 01-03A-60 NO.26 EXHAUST SULPHUR SMELL[LF, L3].)
27	Fuel refill concerns		The fuel tank does not fill smoothly.	(See 01-03A-62 NO.27 FUEL REFILL CONCERNS[LF, L3].)
28	Fuel filling shut off issues		The fuel does not shut off properly.	(See 01-03A-63 NO.28 FUEL FILLING SHUT OFF CONCERNS[LF, L3].)
29	Spark plug condition		An incorrect spark plug condition.	(See 01-03A-64 NO.29 SPARK PLUG CONDITION[LF, L3].)
30	ATX concerns	Upshift/downshift engagement	ATX concerns not related to engine performance.	(See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].) (See 05-03B-4 SYMPTOM TROUBLESHOOTING ITEM TABLE[FS5A-EL].)

QUICK DIAGNOSTIC CHART[LF, L3]

id0103a6800600

X: Applicable

	Troubleshooting item / Possible factor		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open.	Starter interlock switch malfunction (MTX)	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel are seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper.	Cooling system malfunction (Radiator, hoses,overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts are improperly installed.	Cooling fan seat is improper.	Cruise control system operation improperly	Fuel quality
1	Melting of main or other fuses																							
2	MIL illuminates																							
3	Will not crank		x	x	x		x	x			x				x									
4	Hard to start/long crank/erratic start/erraticcrank		x																					x
5	Engine stalls.	After start/at idle							x	x														x
6	Cranks normally but will not start								x	x														x
7	Slow return to idle																		x					
8	Engine runs rough/rolling idle								x	x														x
9	Fast idle/runs on																						x	
10	Low idle/stalls during deceleration																						x	
11	Engine stalls/quits.	Acceleration/cruise							x	x													x	x
	Engine runs rough.	Acceleration/cruise							x	x														x
	Misses	Acceleration/cruise							x	x														x
	Buck/jerk	Acceleration/cruise/ deceleration							x	x														x
	Hesitation/stumble	Acceleration							x	x														x
	Surges	Acceleration/cruise							x	x														x
12	Lack/loss of power	Acceleration/cruise							x	x														x
13	Knocking/pinging	Acceleration/cruise							x										x					
14	Poor fuel economy								x	x									x	x				x
15	Emission compliance								x	x				x					x					
16	High oil consumption/leakage											x	x	x										
17	Cooling system concerns	Overheating														x	x	x	x	x				
18	Cooling system concerns	Runs cold																	x	x				
19	Exhaust smoke								x					x					x					
20	Fuel odor (in engine compartment)																							
21	Engine noise					x								x		x								
22	Vibration concerns (engine)															x					x	x		
23	A/C does not work sufficiently.																							
24	A/C is always on or A/C compressor runs continuously.																							
25	A/C is not cut off under WOT conditions.																						x	
26	Exhaust sulfur smell																							x
27	Fuel refill concerns																							
28	Fuel filling shut off issues																							
29	Spark plug condition								x															
30	ATX concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																					

e3u103zw6001

X: Applicable

	Possible factor / Troubleshooting item		Variable valve timing system malfunction	Variable tumble system malfunction	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes,cracks, gaskets breakage)	Intake air temperature is too hot	Idle learning of electronic throttle control system is not completed	Electronic throttle control improper operation	Throttle body malfunction	Variable intake-air system malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP sensor &crankshaft pulley misadjustment)	Spark plug malfunction	Erratic signal to ignition coil	CKP sensor is damaged. (e.g. open or short circuits)	Crankshaft pulley is damaged	Improper gap between CKP sensor and crankshaft	Fuel pump malfunction (Mechanically or electrically)	Pressure regulator malfunction	Fuel hoses restriction or clogging
1	Melting of main or other fuses																						
2	MIL illuminates		x	x						x		x						x					
3	Will not crank																						
4	Hard to start/long crank/erratic start/erraticcrank					x	x			x			x			x	x	x	x	x	x	x	x
5	Engine stalls.	After start/at idle	x		x	x	x			x			x	x	x	x	x	x	x	x	x	x	x
6	Cranks normally but will not start		x		x	x	x			x			x	x	x	x	x	x	x	x	x	x	x
7	Slow return to idle										x												
8	Engine runs rough/rolling idle		x		x	x	x		x	x			x		x	x	x	x	x	x	x	x	x
9	Fast idle/runs on						x			x	x												
10	Low idle/stalls during deceleration						x			x			x										
11	Engine stalls/quits.	Acceleration/cruise		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
	Engine runs rough.	Acceleration/cruise		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
	Misses	Acceleration/cruise		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
	Buck/jerk	Acceleration/cruise/ deceleration		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
	Hesitation/stumble	Acceleration		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
	Surges	Acceleration/cruise		x	x	x	x			x	x		x			x	x	x	x	x	x	x	x
12	Lack/loss of power	Acceleration/cruise	x	x	x	x	x	x		x	x	x	x			x	x	x	x	x	x	x	x
13	Knocking/pinging	Acceleration/cruise			x																	x	
14	Poor fuel economy		x	x		x						x				x	x					x	
15	Emission compliance					x	x				x		x			x	x					x	x
16	High oil consumption/leakage																						
17	Cooling system concerns	Overheating																					
18	Cooling system concerns	Runs cold																					
19	Exhaust smoke					x								x		x	x				x	x	x
20	Fuel odor (in engine compartment)																					x	
21	Engine noise						x						x										
22	Vibration concerns (engine)																						
23	A/C does not work sufficiently.																						
24	A/C is always on or A/C compressor runs continuously.																						
25	A/C is not cut off under WOT conditions.																						
26	Exhaust sulfur smell												x								x	x	x
27	Fuel refill concerns																						
28	Fuel filling shut off issues																						
29	Spark plug condition					x										x	x				x	x	x
30	ATX concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																				

e3u103zw6002

X: Applicable

	Troubleshooting item / Possible factor		Injectors malfunction (Leakage or clogging, inoperative)	Fuel leakage from fuel system (including insulator,injector O-ring)	Fuel filters restriction or clogging	CMP sensor is damaged. (e.g. open or short circuit)	Camshaft is damaged	Improper air/fuel mixture ratio control	Exhaust system restriction or clogging	Catalytic converter malfunction	EGR system malfunction	EVAP control system malfunction	Fuel-filler cap malfunction	Fuel into evaporative purge hose	Check valve (two-way) malfunction	PCV valve malfunction	Constant voltage supply circuit malfunction	Main relay malfunction (Mechanically or electrically)	PCM or sensor GND circuit open or short	ECT sensor malfunction	TR switch misadjustment (ATX)	TR switch malfunction (ATX)	Brake switch and related circuit malfunction	Manifold absolute pressure sensor and related circuit malfunction	HO2S and related circuit malfunction
1	Melting of main or other fuses																								
2	MIL illuminates					x		x												x	x		x	x	x
3	Will not crank																				x	x			
4	Hard to start/long crank/erratic start/erraticcrank				x	x	x	x	x		x	x				x			x						x
5	Engine stalls.	After start/at idle	x	x		x	x	x	x		x	x				x		x							x
6	Cranks normally but will not start		x	x				x	x		x	x				x	x	x							x
7	Slow return to idle																			x					
8	Engine runs rough/rolling idle		x		x	x	x	x	x		x	x				x			x						x
9	Fast idle/runs on																			x					
10	Low idle/stalls during deceleration							x				x										x	x		x
11	Engine stalls/quits.	Acceleration/cruise	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
	Engine runs rough.	Acceleration/cruise	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
	Misses	Acceleration/cruise	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
	Buck/jerk	Acceleration/cruise/ deceleration	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
	Hesitation/stumble	Acceleration	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
	Surges	Acceleration/cruise	x		x	x	x	x	x		x	x		x	x	x	x	x						x	x
12	Lack/loss of power	Acceleration/cruise	x			x	x		x		x	x					x								
13	Knocking/pinging	Acceleration/cruise				x														x					
14	Poor fuel economy				x	x	x		x								x								
15	Emission compliance				x	x	x	x	x	x	x	x	x				x								x
16	High oil consumption/leakage																x								
17	Cooling system concerns	Overheating																							
18	Cooling system concerns	Runs cold																							
19	Exhaust smoke		x		x												x								
20	Fuel odor (in engine compartment)			x								x													
21	Engine noise																								
22	Vibration concerns (engine)																								
23	A/C does not work sufficiently.																								
24	A/C is always on or A/C compressor runs continuously.																								
25	A/C is not cut off under WOT conditions.																								
26	Exhaust sulfur smell				x							x													
27	Fuel refill concerns											x													
28	Fuel filling shut off issues											x													
29	Spark plug condition		x	x				x	x			x								x					x
30	ATX concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																						

e3u103zw6003

X: Applicable

	Possible factor / Troubleshooting item		IAT sensor and related circuit malfunction	Barometric pressure sensor malfunction	Neutral or clutch pedal position switch and related circuitmalfunction (MTX)	MAF sensor and related circuit malfunction	Knock sensor and related circuitmalfunction	TP sensor and related circuit malfunction	Accelerator pedal position sensor and related circuitmalfunction	EHPAS and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal circuit malfunction)	A/C compressor magnetic clutch malfunction	Condenser fan system malfunction	Improper load signal input	Clutch slippage (MTX)	ATX related parts malfunction (ATX)	VSS and related circuit malfunction	Improper ATF level (ATX)	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	Immobilizer system operating (if equipped)	Immobilizer system or related circuit malfunction (if equipped)
1	Melting of main or other fuses																									
2	MIL illuminates		x	x	x	x	x	x		x								x								
3	Will not crank																								x	x
4	Hard to start/long crank/erratic start/erraticcrank					x																				
5	Engine stalls.	After start/at idle		x							x	x													x	x
6	Cranks normally but will not start																								x	x
7	Slow return to idle																									
8	Engine runs rough/rolling idle			x						x	x	x		x	x											
9	Fast idle/runs on														x											
10	Low idle/stalls during deceleration				x	x		x	x			x	x													
11	Engine stalls/quits.	Acceleration/cruise		x		x		x	x		x	x				x	x	x								
	Engine runs rough.	Acceleration/cruise		x		x		x	x		x	x				x	x	x								
	Misses	Acceleration/cruise				x		x	x		x	x				x	x	x								
	Buck/jerk	Acceleration/cruise/ deceleration				x		x	x		x	x				x	x	x								
	Hesitation/stumble	Acceleration		x		x		x	x		x	x				x	x	x								
	Surges	Acceleration/cruise				x		x	x		x	x				x	x	x								
12	Lack/loss of power	Acceleration/cruise				x		x	x		x	x				x	x	x		x						
13	Knocking/pinging	Acceleration/cruise	x			x	x																			
14	Poor fuel economy					x										x			x	x						
15	Emission compliance																									
16	High oil consumption/leakage																									
17	Cooling system concerns	Overheating									x	x		x												
18	Cooling system concerns	Runs cold												x												
19	Exhaust smoke																									
20	Fuel odor (in engine compartment)																									
21	Engine noise																				x					
22	Vibration concerns (engine)																				x	x	x	x		
23	A/C does not work sufficiently.										x	x	x													
24	A/C is always on or A/C compressor runs continuously.											x	x													
25	A/C is not cut off under WOT conditions.								x																	
26	Exhaust sulfur smell																									
27	Fuel refill concerns																									
28	Fuel filling shut off issues																									
29	Spark plug condition					x																				
30	ATX concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																							

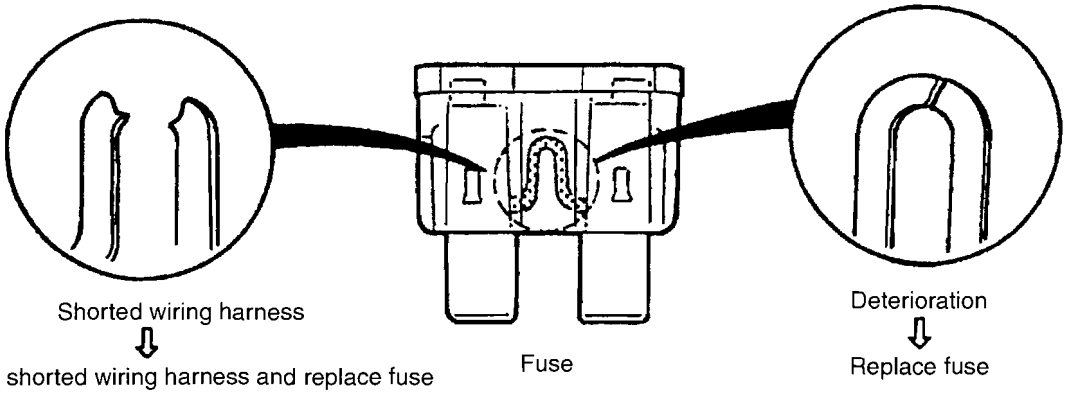
e3u103zw6004

NO.1 MELTING OF MAIN OR OTHER FUSES[LF, L3]

id0103a6800700

1	MELTING OF MAIN OR OTHER FUSES

[TROUBLESHOOTING HINTS]
Inspect condition of fuse.



Damaged fuse	Related wiring harness
MAIN	**MAIN fuse** • Generator • Starter
ENGINE	**ENGINE fuse** • Main Relay — ENG BAR1 fuse — ENG BAR2 fuse — ENG BAR3 fuse — ENG BAR4 fuse (California emission regulation applicable model) — EGI INJ fuse
ENG BAR1	**ENG BAR1 fuse** • PCM (4EAT) • Purge solenoid valve • Variable intake-air solenoid valve • EGR valve • Variable tumble solenoid valve • OCV • MAF/IAT sensor • VSS (4EAT) • Accelerator pedal position sensor • EVAP system leak detection pump • ET control relay
ENG BAR2	**ENG BAR2 fuse** • PCM
ENG BAR3	**ENG BAR3 fuse** • Front HO2S heater (California emission regulation applicable model) • Middle HO2S heater (California emission regulation applicable model) • Rear HO2S heater (except for California emission regulation applicable model)
ENG BAR4 (California emission regulation applicable model)	**ENG BAR4 fuse** • Rear HO2S heater (California emission regulation applicable model)
EGI INJ	**EGI INJ fuse** • Front HO2S heater (except for California emission regulation applicable model) • Fuel injectors
IG KEY1	**IG KEY1 fuse** • Ignition switch — ENGINE fuse (in PJB)
IG KEY2	**IG KEY2 fuse** • Ignition switch — BACK fuse (in PJB)

Damaged fuse	Related wiring harness
ENGINE (in PJB)	**ENGINE fuse (in PJB)** • PCM • Fuel pump relay • Ignition coils • Condenser
STARTER	**STARTER fuse** • Starter relay — Starter
ENG+B	**ENG+B fuse** • PCM
BTN	**BTN fuse** • OBD fuse (in PJB)
OBD (in PJB)	**OBJ fuse (in PJB)** • DLC-2
F/PUMP	**F/PUMP fuse** • Fuel pump relay • ET control relay
FAN	**FAN fuse** • FAN control module
BACK (in PJB)	**BACK fuse (in PJB)** • TR switch

NO.2 MIL ILLUMINATES[LF, L3]

id0103a6800800

2	MIL ILLUMINATES
DESCRIPTION	The MIL is illuminated incorrectly.
POSSIBLE CAUSE	• The PCM illuminates for emission-related concern (DTC is stored in PCM) • Instrument cluster malfunction **Note** • If the MIL blinks at steady rate, misfire condition could possibly exist.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** • Go to appropriate the DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** • Inspect instrument cluster operation. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
2	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.3 WILL NOT CRANK[LF, L3]

id0103a6800900

3	WILL NOT CRANK
DESCRIPTION	The starter does not work.
POSSIBLE CAUSE	• Open starter circuit between ignition switch and starter • TR switch malfunction (ATX) • TR switch misadjustment (ATX) • Low or dead battery • Charging system malfunction. • Starter interlock switch malfunction (MTX) • Starter malfunction • Seized/hydrolocked engine, flywheel (MTX) or drive plate (ATX) • Immobilizer system and/or circuit malfunction (if equipped) • Immobilizer system operating properly. (Ignition key is not registered) (if equipped)

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • The following test should be performed for vehicles with immobilizer system. Go to Step 8 for vehicles without immobilizer system. Connect the M-MDS to the DLC-2. Do the following conditions appear? • The engine is not completely started. • DTC P1260 is displayed.	Yes	**Both conditions appear:** Go to Step 4.
		No	**Either or other condition appears:** Go to the next step.
2	Turn the ignition switch to the ON position. Is the coil connector securely connected to the coil?	Yes	Go to the next step.
		No	Connect the coil connector securely. Return to Step 1.
3	Does the security light flush?	Yes	Go to the next step.
		No	Inspect instrument cluster and wiring harness. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
4	Connect the M-MDS to the DLC-2 and retrieve DTC. **DTC** **B1213, B2139, B2141, B1600, B1601, B1602, B1681, B2103, B2431, U2510**	Yes	Go to appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
5	Inspect for the following wiring harnesses and connectors: • Between coil terminal A and instrument cluster terminal 2Q • Between coil terminal B and instrument cluster terminal 2S Is there any malfunction?	Yes	Repair or replace suspected wiring harness and connector.
		No	Go to the next step.
6	Inspect for the following wiring harnesses and connectors: • Between PCM terminal 1AI and instrument cluster terminal 1I • Between PCM terminal 1AM and instrument cluster terminal 1K Is there any malfunction?	Yes	Repair or replace suspected wiring harness and connector.
		No	Go to the next step.
7	Is there continuity between PCM terminal 1B*1, 1AB*2 and starter relay with clutch pedal depressed (MTX with starter interlock system), P or N position (ATX)?	Yes	Go to the next step.
		No	Repair or replace wiring harness.
8	Inspect the following: • Battery connection • Battery condition • Transaxle is in Park or Neutral. (ATX) • Clutch is fully depressed. (MTX) • Fuses Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 8.

STEP	INSPECTION	RESULTS	ACTION
9	Is clicking sound heard from starter when the ignition switch is turned to START?	Yes	Go to the next step.
		No	Go to Step 11.
10	Inspect the starting system. (See 01-19A-3 STARTER INSPECTION[LF, L3].) Is starting system normal?	Yes	Inspect for seized/hydrolocked engine, flywheel or drive plate. (See 05-10-16 FLYWHEEL INSPECTION[LF, L3].)
		No	Repair or replace components if required.
11	Do any other electrical accessories function?	Yes	Go to the next step.
		No	Inspect the charging system. (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
12	**Note** • The following test should be performed on ATX only. For MTX, go to the next step. Connect the M-MDS to the DLC-2. Access TR PID. Turn the ignition switch to the ON position. Is TR PID indicated P/N when selecting P or N position?	Yes	Go to the next step.
		No	Inspect adjustment of TR switch. If TR switch is adjusted properly, inspect for open circuit between TR switch and PCM terminal 1AH*3, 1U*4, 1S*5 or starter.
13	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].) **Communication error message is displayed:** Inspect for the following: • Open circuit in wiring harness between main relay and PCM terminal 1BE or 1BG*3, 1O*4, 1A*5 (ATX) • Open circuit in wiring harness between main relay terminal E and PCM terminal 1Q*1, 1AT*2 • Main relay is stuck open. • Open or short circuit in wiring harness between DLC and PCM terminals 1AM or 1AI • Open or poor GND circuit (PCM terminal 1BD*1, 1AZ*2, 1BB, 1AZ*1, 1BD*2 or 1BH) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Inspect the following: • START circuit in ignition switch • Open circuit in wiring harness between ignition switch and starter • Starter interlock switch (MTX)
14	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model and Except for California emission regulation applicable LF ATX model
*2 : Except for California emission regulation applicable LF ATX, L3 model
*3 : California emission regulation applicable LF ATX model
*4 : California emission regulation applicable L3 ATX model and Except for California emission regulation applicable L3 ATX model
*5 : Except for California emission regulation applicable LF ATX model

NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK[LF, L3]

id0103a6801000

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
DESCRIPTION	• The starter cranks engine at normal speed but engine requires excessive cranking time before starting. • The battery is in normal condition.
POSSIBLE CAUSE	• Erratic signal to ignition coil • Vacuum leakage • Poor fuel quality • Starting system malfunction • Spark plug malfunction • Air leakage from intake-air system • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Improper air/fuel mixture ratio control • Air cleaner restriction • Improper operation of electronic throttle control system • PCV valve malfunction • Inadequate fuel pressure • Purge solenoid valve malfunction • MAF sensor contamination • Incorrect MAF sensor GND voltage • Restriction in exhaust system • EGR valve malfunction • Pressure regulator malfunction (built-in fuel pump unit) **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Vacuum leakage • Proper fuel quality (such as proper octane, contamination, winter/summer blend) • Loose bands on intake-air system • Cracks on intake-air system parts • Intake-air system restriction (such as air cleaner element, fresh air duct.) Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns – Overheating". (See 01-03A-50 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[LF, L3].)
		No	Go to the next step.
4	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.

STEP	INSPECTION	RESULTS	ACTION
5	Inspect the spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders. Go to the next step.
6	Visually inspect the CKP sensor and teeth of crankshaft pulley. Are the CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
7	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
8	Attempt to start engine at part throttle. Does engine run smoothly at part throttle?	Yes	Inspect the electronic throttle control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
		No	Go to the next step.
9 —	Install the fuel pressure gauge between the fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position. Is fuel line pressure correct with ignition switch ON? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and the fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
10	Is the fuel line pressure held after ignition switch is turned off? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Inspect the fuel injector. (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) If the fuel injector is normal, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
11	Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose. Start engine. Is starting condition improved?	Yes	Inspect if the purge solenoid valve is stuck open.
		No	Go to the next step.
12	Inspect the MAF sensor for following: • Contamination • MAF sensor terminal B voltage (GND circuit) Is there any contamination?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
13	Visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
14	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace the EGR valve. (See 01-16A-13 EGR VALVE REMOVAL/ INSTALLATION[LF, L3].)
		No	Go to the next step.
15	Inspect the starting system. (See 01-19A-3 STARTER INSPECTION[LF, L3].) Is starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. If there is no malfunction, remove EGR valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace components as required.
16	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, Replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.5 ENGINE STALLS-AFTER START/AT IDLE[LF, L3]

id0103a6801100

5	ENGINE STALLS—AFTER START/AT IDLE
DESCRIPTION	• Engine stops unexpectedly.
POSSIBLE CAUSE	• A/C system operation is improper • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or wrong installation • Vacuum leakage • Engine overheating • Low engine compression • Erratic signal to ignition coil • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Electrical connector disconnection • Open or short circuit in fuel pump body and related wiring harness • No battery power supply to PCM or poor GND • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Ignition coil malfunction • Improper air/fuel mixture ratio control • Improper valve timing • Improper operation variable valve timing control system • Immobilizer system and/or circuit malfunction • Immobilizer system operating property. (Ignition key is not registered.) • Pressure regulator malfunction (built-in fuel pump unit) **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • The following test should be perform for vehicles with immobilizer system. Go to Step 8 for vehicles without immobilizer system. Connect the M-MDS to the DLC-2. Do the following conditions appear? • The engine is not completely started. • DTC P1260 is displayed.	Yes	**Both conditions appear:** Go to Step 3.
		No	**Either or other condition appears:** Go to the next step.
2	Does the engine stall after **approx. 2 s** since the engine is started?	Yes	Go to the next step.
		No	Immobilizer system is normal. Go to Step 8.
3	Is coil connector securely connected to coil?	Yes	Go to the next step.
		No	Connect the coil connector securely. Return to Step 2.

STEP	INSPECTION	RESULTS	ACTION
4	Turn the ignition switch to the ON position. Does security light flush?	Yes	Go to the next step.
		No	Inspect the instrument cluster and wiring harness. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
5	Connect the M-MDS to the DLC-2 and retrieve DTC. Are any of the following DTCs displayed? **DTC** **B1213, B1600, B1601, B1602, B1681, B2103, B2139, B2141, B2431, U2510**	Yes	Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
6	Inspect for the following wiring harnesses and connectors: • Between coil terminal A and instrument cluster terminal 2Q • Between coil terminal B and instrument cluster terminal 2S Are there any malfunctions?	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
7	Inspect for the following wiring harnesses and connectors: • Between PCM terminal 1AI and instrument cluster terminal 1I • Between PCM terminal 1AM and instrument cluster terminal 1K Are there any malfunctions?	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
8	Verify the following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Fuel quality: proper octane, contamination, winter/summer blend • Electrical connections • Smooth operation of throttle valve Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 8.
9	Connect the M-MDS to the DLC-2. Access the APP1 and APP2 PIDs. Crank the engine with accelerator pedal released. Are the APP1 and APP2 PIDs indicating that the accelerator pedal is in the released position?	Yes	Go to the next step.
		No	Inspect for the following: • APP sensor • Wiring harnesses and connectors for following: — PCM terminal 1AC*1, 1AL*2, 1AO*3 - APP sensor terminal E — PCM terminal 1AP*1, 1Y*2, 1AP*3 - APP sensor terminal B — PCM terminal 1AL*1, 1AW*2, 1AL*3 - APP sensor terminal A — PCM terminal 1AS*1, 1AA*2, 1AV*3 - APP sensor terminal C — Ignition switch terminal A - APP sensor terminal F — APP sensor terminal D - GND
10	Connect the M-MDS to the DLC-2. Access the TP PID. Crank the engine with accelerator pedal released. Are the TP PID indicates the closed throttle position?	Yes	Go to the next step.
		No	Inspect for the following: • TP sensor • Wiring harnesses and connectors for following: — PCM terminal 2AO*1, 2K*2, 2AO*3 - TP sensor terminal B — PCM terminal 2AK*1, 2M*2, 2AK*3 - TP sensor terminal A — PCM terminal 2AL*1, 2I*2, 2AL*3 - TP sensor terminal C — PCM terminal 2AP*1, 2O*2, 2AP*3 - TP sensor terminal D

STEP	INSPECTION	RESULTS	ACTION
11	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].) **Communication error message is displayed:** Inspect for the following: • Open circuit in wiring harness between main relay and PCM terminal 1BE or 1A (ATX) • Open main relay GND circuit • Main relay is stuck open. • Open or short circuit in wiring harness between DLC and PCM terminals 1AM or 1AI • Open or poor GND circuit (PCM terminal 1AZ, 1BB, 1BC*2, 1BD, 1BG, 1BH, 2BB*1 or 2BC*1) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Go to the next step.
12	Attempt to start engine at part throttle. Does engine run smoothly at part throttle?	Yes	Inspect electronic throttle control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
		No	Go to the next step.
13	Connect the M-MDS to the DLC-2. Access RPM PID. Is RPM PID indicating engine speed during engine cranking?	Yes	Go to the next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit in wiring harness between CKP sensor terminal C and PCM terminal 2AQ*1, 2T*2, 2AQ*3 • Open or short circuit in wiring harness between CKP sensor terminal B and PCM terminal 2W*1, 2U*2, 2W*3 • Open or short circuit in CKP sensor wiring harnesses If CKP sensor and wiring harness are normal, go to the next step.
14	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
15	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
16	Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Go to the next step. If symptoms occurs with the A/C on, go to Step 23.
		No	Repair or replace the malfunctioning part according to spark test result.
17	Inspect the spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install spark plugs on original cylinders. Go to the next step.
18	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
19	visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
20	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position. Is fuel line pressure correct with ignition switch ON? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
21	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Is fuel line pressure held after ignition switch is turned off? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Inspect the fuel injector. If the fuel injector is normal, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
22	**Note** • The following test is for stall concerns with the A/C on. If other symptoms exist, go to the next step. Connect pressure gauges to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See 07-10-6 REFRIGERANT PRESSURE CHECK.)	Yes	Go to the next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". (See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].) For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
23	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid side. Plug opening end of vacuum hose. Start the engine. Is the engine stall now eliminated?	Yes	Inspect if purge solenoid valve is stuck open. Inspect evaporative emission control system.
		No	Go to the next step.
24	Is air leakage felt or heard at intake-air system components while racing the engine to higher speed?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
25	Inspect the engine condition while tapping EGR valve housing. Does the engine condition improve?	Yes	Replace the EGR valve.
		No	Go to the next step.
26	Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does variable valve timing control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts according to variable valve timing control system operation inspection results.
27	Is the engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for cause.
28	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.6 CRANKS NORMALLY BUT WILL NOT START[LF, L3]

id0103a6801200

6	CRANKS NORMALLY BUT WILL NOT START
DESCRIPTION	• The starter cranks engine at normal speed but the engine will not run. • Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after engine stall. • Fuel is in tank. • Battery is in normal condition.
POSSIBLE CAUSE	• No battery power supply to PCM • Air leakage from intake-air system • Open PCM GND or vehicle body GND • Improper operation of electronic throttle control system • EGR valve malfunction • No signal from CKP sensor due to sensor, related wire or incorrect installation • No signal from CMP sensor due to sensor, related wire or incorrect installation • Low engine compression • Engine overheating • Vacuum leakage • Erratic signal to ignition coil • Improper air/fuel mixture ratio control • Poor fuel quality • PCV valve malfunction • Restriction in intake-air system • Restriction in exhaust system • Disconnected electrical connector • Open or short circuit in fuel pump body and related wiring harness • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel leakage from injector • Fuel injector is clogged. • Purge solenoid valve malfunction • Spark plug malfunction • Ignition coil malfunction • Improper variable valve timing control system operation • Improper valve timing • Immobilizer system and/or circuit malfunction (if equipped) • Immobilizer system operating properly. (Ignition key is not registered.) (if equipped) • Pressure regulator malfunction (built-in fuel pump unit) **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	**Note** • The following test should be perform for vehicles with immobilizer system. Go to Step 8 for vehicles without immobilizer system. Connect the M-MDS to the DLC-2. Do any of the following conditions appear? • Engine does not completely start. • DTC P1260 is displayed.	Yes	**Both conditions appear:** Go to Step 3.
		No	**Either or other condition appears:** Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
2	Does engine stall after **approx. 2 s** from when it is started?	Yes	Go to the next step.
		No	Immobilizer system is normal. Go to Step 8.
3	Is the coil connector securely connected to the coil?	Yes	Go to the next step.
		No	Connect the coil connector securely. Return to Step 2.
4	Turn the ignition switch to the ON position. Does the security light flush?	Yes	Go to the next step.
		No	Inspect the instrument cluster and wiring harness.
5	Connect the M-MDS equivalent to the DLC-2 and retrieve the DTC. Are any of the following DTCs displayed? **DTC** **B1213, B1600, B1601, B1602, B1681, B2103, B2139, B2141, B2431, U2510**	Yes	Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
6	Inspect the following wiring harnesses and connectors: • Between coil terminal A and instrument cluster terminal 2Q • Between coil terminal B and instrument cluster terminal 2S Is there any malfunction?	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
7	Inspect the following wiring harnesses and connectors: • Between PCM terminal 1AI and instrument cluster terminal 1I • Between PCM terminal 1AM and instrument cluster terminal 1K Is there any malfunction?	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
8	Verify the following: • Vacuum connection • External fuel shut off or accessory (such as kill switch, alarm) • Fuel quality: proper octane, contamination, winter/summer blend • No air leakage from intake-air system • Intake-air system restriction (such as air cleaner element, fresh air duct) • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 8.
9	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].) **Communication error message is displayed:** Inspect for the following: • Open circuit in wiring harness between main relay and PCM terminal 1BE or 1A(ATX) • Open main relay GND circuit • Open or short circuit in wiring harness between DLC and PCM terminal 1AM or 1AI • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 1AZ, 1BB, 1BC*2, 1BD, 1BG, 1BH, 2BB*1 or 2BC*1) • Poor connection of vehicle body GND
		No	**No DTC is displayed:** Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
10	Connect the M-MDS to the DLC-2. Access the APP1 and APP2 PIDs. Crank the engine with accelerator pedal released. Are the APP1 and APP2 PIDs indicating that the accelerator pedal is in the released position?	Yes	Go to the next step.
		No	Inspect for the following: • APP sensor • Wiring harnesses and connectors for following: — PCM terminal 1AC*1, 1AL*2, 1AO*3, - APP sensor terminal E — PCM terminal 1AP*1, 1Y*2, 1AP*3 - APP sensor terminal B — PCM terminal 1AL*1, 1AW*2, 1AL*3 - APP sensor terminal A — PCM terminal 1AS*1, 1AA*2, 1AV*3 - APP sensor terminal C — Ignition switch terminal A - APP sensor terminal F — APP sensor terminal D - GND
11	Connect the M-MDS to the DLC-2. Access the TP PID. Crank the engine with accelerator pedal released. Are the TP PID indicates the closed throttle position?	Yes	Go to the next step.
		No	Inspect for the following: • TP sensor • Wiring harnesses and connectors for following: — PCM terminal 2AO*1, 2K*2, 2AO*3 - TP sensor terminal B — PCM terminal 2AK*1, 2M*2, 2AK*3 - TP sensor terminal A — PCM terminal 2AL*1, 2I*2, 2AL*3 - TP sensor terminal C — PCM terminal 2AP*1, 2O*2, 2AP*3 - TP sensor terminal D
12	Does the engine start with the throttle valve closed?	Yes	Go to Step 29.
		No	Go to the next step.
13	Will the engine start and run smoothly at part throttle?	Yes	Inspect the electronic throttle control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
		No	Go to the next step.
14	Connect the M-MDS to the DLC-2. Access RPM PID. Is RPM PID indicating the engine speed when cranking the engine?	Yes	Go to the next step.
		No	Inspect for the following: • Open or short circuit in CKP sensor • Open or short circuit in wiring harness between CKP sensor terminal C and PCM terminal 2AQ*1, 2T*2, 2AQ*3 • Open or short circuit in wiring harness between CKP sensor terminal B and PCM terminal 2W*1, 2U*2, 2W*3 • Open or short circuit in CKP sensor wiring harnesses If CKP sensor and wiring harness are normal, go to the next step.
15	Visually inspect the CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
16	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
17	Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.

STEP	INSPECTION	RESULTS	ACTION
18	Inspect the spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders. Go to the next step.
19	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
20	visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
21	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position. Is fuel line pressure correct when ignition switch is turned on/off **five times**? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
22	Visually inspect the fuel injector O-ring and fuel line for fuel leakage. Service if necessary. Is the fuel line pressure held after the ignition switch is turned off? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Inspect the fuel injector. If the fuel injector is normal, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
23	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Start the engine. Is starting condition improved?	Yes	Inspect if the purge solenoid valve is stuck open mechanically. Inspect the evaporative emission control system.
		No	Go to the next step.
24	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
25	Inspect the engine condition while tapping EGR valve housing. Is engine condition improved?	Yes	Replace the EGR valve.
		No	Go to the next step.
26	Inspect the variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does variable valve timing control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
27	Is the engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for causes.
28	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.7 SLOW RETURN TO IDLE[LF, L3]

id0103a6801300

7	SLOW RETURN TO IDLE
DESCRIPTION	Engine takes more time than normal to return to idle speed.
POSSIBLE CAUSE	• ECT sensor malfunction • Thermostat is stuck open. • Throttle body malfunction • Air leakage from intake-air system

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
2	Remove thermostat and inspect operation. (See 01-12A-8 THERMOSTAT REMOVAL/ INSTALLATION[LF, L3].) (See 01-12A-8 THERMOSTAT INSPECTION[LF, L3].) Is thermostat normal?	Yes	ECT and thermostat are normal. Go to the next step.
		No	Access ECT PID on the M-MDS. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
3	Is throttle body free of contamination?	Yes	Inspect for air leakage from the intake-air system components while racing the engine to higher speed.
		No	Clean or replace throttle body.
4	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.8 ENGINE RUNS ROUGH/ROLLING IDLE[LF, L3]

id0103a6801400

8	ENGINE RUNS ROUGH/ROLLING IDLE
DESCRIPTION	• Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively. • Idle speed is too slow and engine shakes excessively.
POSSIBLE CAUSE	• Air leakage from intake-air system parts • A/C system operation is improper • Erratic signal to ignition coil • Spark plug malfunction • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • Idle learning of electronic throttle control system is not completed • EGR valve malfunction • Erratic or no signal from CMP sensor • Low engine compression • Improper valve timing • Improper variable valve timing control system operation. • Erratic signal from CKP sensor • Improper air / fuel mixture ratio control operation (abnormal signal form MAF sensor or HO2S) • Open or short circuit in PCM GND circuit • Poor fuel quality • PCV valve malfunction • Air cleaner restriction • Restriction in exhaust system • Disconnected electrical connectors • Inadequate fuel pressure • Fuel pump body mechanical malfunction • Improper load signal input • Fuel line restriction or clogging • Improper fuel injection control operation • Fuel leakage from fuel injector • Fuel injector clogging • Engine overheating • Vacuum leakage • Pressure regulator malfunction (built-in fuel pump unit) **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Warm up the engine. Idle the engine for **5 min.** Is the symptom disappeared?	Yes	Troubleshooting completed. (Cause of this symptom is that the idle learning of electronic throttle control system is not completed.)
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
2	Verify the following: • External fuel shut off or accessory (such as kill switch, alarm) • Fuel quality (such as proper octane, contamination, winter/summer blend) • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve • PCM GND circuit (2BH, 1BH, 1BD, AZ, 1BB)*1 (1BH, 1AZ, 1BD, 1BB)*2 Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.
3	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
4	Is the engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to the next step.
5	Connect the M-MDS to the DLC-2. Access MAF PID. Drive vehicle with monitoring PID. Is MAF PID within specification?	Yes	Go to the next step.
		No	Inspect for open or short circuit of MAF sensor and related wiring harness.
6	**Note** • The following test is for engine running at rough idle with A/C on. If other symptoms exist, go to the next step. Connect pressure gauge to A/C low and high pressure side lines. Start engine and idle it. Turn the A/C switch on. Measure low side and high side pressures. Are pressures within specifications? (See 07-10-6 REFRIGERANT PRESSURE CHECK.)	Yes	Go to the next step.
		No	If the A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
7	**Note** • The following test is for engine running rough with P/S on. If other symptoms exist, go to the next step. Connect the M-MDS to the DLC-2. Start the engine and idle it. Retrieve any DTCs for EHPAS Is there any EHPAS DTC displayed?	Yes	Go to appropriate the DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
8	Visually inspect the CKP sensor and teeth of crankshaft pulley. Are the CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
9	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
10	Inspect the spark plug condition. Is the spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from injector. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders. Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
11	Perform the electronic throttle control system operation inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.
12	Install fuel pressure gauge between fuel pipe and fuel distributor. Start the engine and run it at idle. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Low:** Inspect the fuel line for clogging. If there is no malfunction, replace fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
13	Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line. Service if necessary. Does fuel line pressure hold after ignition switch is turned off? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3])	Yes	Go to the next step.
		No	Inspect fuel injector. If fuel injector is normal, replace fuel pump unit.
14	Connect the M-MDS to the DLC-2. Start the engine and idle it. Access LONG FT1 PID. Measure LONG FT1 PID at idle. Is PID value between **–14% and +14%**?	Yes	Go to the next step.
		No	LONG FT1 PID is out of specification. Less than specification (too rich): • Inspect EVAP control system. — If system is normal, go to Step 14. Greater than specification (too lean): • Inspect for air leakage at intake-air system components. — If system is normal, go to the next step.
15	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Start the engine. Does the engine condition improve?	Yes	Check if purge solenoid valve is stuck open mechanically. Inspect EVAP control system.
		No	Go to the next step.
16	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
17	Visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
18	Visually inspect the CMP sensor and teeth of camshaft. Are the CMP sensor and teeth of camshaft normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
19	Inspect the engine condition while tapping EGR valve housing. Does the engine condition improve?	Yes	Replace the EGR valve.
		No	Go to the next step.
20	Inspect variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does variable valve timing control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
21	Is engine compression correct?	Yes	Inspect the valve timing. (See 01-10A-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3].)
		No	Inspect for causes.

STEP	INSPECTION	RESULTS	ACTION
22	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.9 FAST IDLE/RUNS ON[LF, L3]

id0103a6801500

9	FAST IDLE/RUNS ON
DESCRIPTION	• The engine speed continues at fast idle after warm-up. • The engine runs after the ignition switch is turned off.
POSSIBLE CAUSE	• ECT sensor malfunction • Air leakage from intake-air system • Throttle body malfunction • Accelerator pedal position sensor misadjustment • Cruise control system operation improperly • Improper load signal input • Improper operation of electronic throttle control system

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Access ECT PID. Start and warm up engine to normal operating temperature. Is ECT PID between **82—112°C {180—234°F}**?	Yes	Go to the next step.
		No	**ECT PID is higher than 112°C {234°F}:** Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating". **ECT PID is less than 82°C {180°F}:** Go to symptom troubleshooting "No.18 Cooling system concerns - Runs cold".
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Measure voltages at PCM terminal 1AP, 1R, 1O (MTX) and 1S. (See 01-40A-13 PCM INSPECTION[LF, L3].) Are voltage normal?	Yes	Go to the next step.
		No	**If PCM terminal 1AU*1, 1AP*2, 1AU*3 voltage is not specified:** Inspect A/C switch, refrigerant pressure switch and fan switch. **If PCM terminal 1J*1, 1R*2, 1J*3 voltage is not specified:** Inspect refrigerant pressure switch (middle pressure). **If PCM terminal 1D voltage is not specified:** Inspect clutch pedal position (CPP) switch. (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].) **If PCM terminal 1X voltage is not specified:** Inspect neutral switch (MTX), transaxle range (TR) switch (ATX). (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].) (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].) (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)
4	Connect the M-MDS to the DLC-2. Start the engine and idle it. Retrieve any DTCs for EHPAS. Is there any EHPAS DTC displayed?	Yes	**DTC is displayed:** Go to appropriate DTC inspection.
		No	**No DTC is displayed:** Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
5	Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts if necessary.
		No	Inspect the following: • Electronic throttle control system operation • Accelerator pedal position sensor
6	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3]

id0103a6801600

10	LOW IDLE/STALLS DURING DECELERATION
DESCRIPTION	• Engine stops unexpectedly at the beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	• Vacuum leakage • Improper operation of electronic throttle control system • Air leakage from intake-air system • Improper air/fuel mixture ratio control • Evaporative emission control system malfunction • Accelerator pedal position sensor or related circuit malfunction • Accelerator pedal position sensor misadjustment • TP sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Brake switch or related circuit malfunction • Neutral/clutch pedal position switch or related circuit malfunction (MTX) • TR switch or related circuit malfunction (ATX) • Improper A/C magnetic clutch operation

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does the engine idle roughly?	Yes	Go to symptom troubleshooting "No.8 Engine runs rough/rolling idle". (See 01-03A-32 NO.8 ENGINE RUNS ROUGH/ ROLLING IDLE[LF, L3].)
		No	Go to the next step.
2	Turn off the A/C switch and fan switch. Does the A/C magnetic clutch engage?	Yes	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously." (See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].)
		No	Go to the next step.
3	Verify the following: • Proper routing of and no damage to vacuum lines • No air leakage from intake-air system Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 3.
4	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
5	Perform the electronic throttle control system operation inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.

STEP	INSPECTION	RESULTS	ACTION
6	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive the vehicle. Does the engine condition improve?	Yes	Inspect the evaporative emission control system.
		No	Go to the next step.
7	Connect the M-MDS to the DLC-2. Access APP1, APP2, TP, MAF and VSS PIDs. Monitor each PID while driving vehicle. (See 01-40A-13 PCM INSPECTION[LF, L3].) Are PIDs normal?	Yes	Go to the next step.
		No	**APP1, APP2 PIDs:** Inspect the accelerator pedal position sensor. **TP PID:** Inspect TP sensor. **MAF PID:** Inspect MAF sensor. **VSS PID:** Inspect VSS.
8	Measure voltage at PCM terminal 1AU, 1O (MTX), and 1S. (See 01-40A-13 PCM INSPECTION[LF, L3].) Are voltages normal?	Yes	Intermittent concern exists. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	**If PCM terminal 1AB*1, 1AU*2, 1AB*3 voltage is not as specified:** Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.) **If PCM terminal 1D voltage is not as specified:** Inspect the clutch pedal position switch. (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].) **If PCM terminal voltage 1X is not as specified:** Inspect the neutral switch (MTX). (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].) Inspect the TR switch (ATX). (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].) (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)
9	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM INSPECTION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES[LF, L3]

id0103a6801700

11	**ENGINE STALLS/QUITS — ACCELERATION/CRUISE** **ENGINE RUNS ROUGH — ACCELERATION/CRUISE** **MISSES — ACCELERATION/CRUISE** **BUCK/JERK — ACCELERATION/CRUISE/DECELERATION** **HESITATION/STUMBLE — ACCELERATION** **SURGES — ACCELERATION/CRUISE**
DESCRIPTION	• Engine stops unexpectedly at the beginning of acceleration or during acceleration. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, cruising, or deceleration. • Momentary pause at beginning of acceleration or during acceleration • Momentary minor irregularity in engine output

11	**ENGINE STALLS/QUITS — ACCELERATION/CRUISE** **ENGINE RUNS ROUGH — ACCELERATION/CRUISE** **MISSES — ACCELERATION/CRUISE** **BUCK/JERK — ACCELERATION/CRUISE/DECELERATION** **HESITATION/STUMBLE — ACCELERATION** **SURGES — ACCELERATION/CRUISE**
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Main relay intermittent malfunction • Throttle body malfunction • Engine overheating • Spark plug malfunction • Improper air/fuel mixture ratio control operation • Improper variable tumble control operation • Erratic signal to ignition coil • Air cleaner restriction • PCV valve malfunction • Fuel flow into evaporative purge hose • Improper valve timing due to jumping out timing chain • Restriction in exhaust system • Intermittent open or short circuit in fuel body pump circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Check valve (two-way) malfunction integrated with fuel tank • Fuel leakage from fuel injector • Fuel injector clogging • Fuel line restriction or clogging • Pressure regulator malfunction (built-in fuel pump unit) • Erratic signal form Accelerator pedal position sensor • Erratic signal form TP sensor • Intermittent open or short circuit of MAF sensor, TP sensor, Accelerator pedal position sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) • Improper variable intake-air control operation • Loose attaching bolts or worn engine mounts **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: such as EGR valve • Ignition wiring • Fuel quality (such as proper octane, contamination, winter/summer blend) • Electrical connections • Smooth operation of throttle valve Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to the next step.
4	Connect the M-MDS to the DLC-2. Access APP1, APP2, RPM, VPWR, MAF, TP and VSS PIDs. Drive the vehicle with monitoring PIDs. Are PIDs within specifications? (See 01-40A-13 PCM INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**APP1, APP2 PIDs:** Inspect if output signal from accelerator pedal position sensor changes smoothly. **RPM PID:** Inspect the CKP sensor and related wiring harness for vibration or intermittent open/short circuit. **VPWR PID:** Inspect for open circuit intermittently. **MAF PID:** Inspect for open circuit of the MAF sensor and related wiring harness intermittently. **TP PID:** Inspect if output signal from TP sensor changes smoothly. **VSS PID:** Inspect for open circuit of VSS and related wiring harness intermittently.
5	Visually inspect the CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
6	Inspect the spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect for fuel leakage from fuel injector. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders. Go to the next step.
7	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
8	Perform the electronic throttle control system operation inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle system operation inspection results.
9	Visually inspect deformed exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
10	Install fuel pressure gauge between the fuel pipe and fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position. Is fuel line pressure correct with ignition switch to ON position? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
11	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Is fuel line pressure held after ignition switch is turned off? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Inspect the fuel injector. If the fuel injector is normal, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
12	**Note** • The following test is for engine stall with the A/C on. If other symptom exists, go to the next step. Connect a pressure gauge to A/C low and high pressure side lines. Turn the A/C on and measure low side and high side pressure. Are pressures within specifications? (See 07-10-6 REFRIGERANT PRESSURE CHECK.)	Yes	Go to the next step.
		No	If the A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". (See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].) For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
13	**Note** • The following test should be performed for symptom with cruise control ON. If other symptoms exist, go to the next step. Inspect cruise control system. Is cruise control system normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
14	Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) Is the front HO2S normal?	Yes	Go to the next step.
		No	Replace the front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
15	Inspect the evaporative purge hose between the fuel tank and the purge valve. Does fuel flow into evaporative purge hose?	Yes	Inspect the check valve (two-way). (See 01-14A-12 FUEL TANK INSPECTION[LF, L3].)
		No	Go to the next step.
16	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from the purge solenoid valve side. Plug opening end of vacuum hose. Drive the vehicle. Does the engine condition improve?	Yes	Go to the next step. Inspect if the purge solenoid valve is stuck open mechanically. Inspect the evaporative emission control system.
		No	Go to the next step.
17	Visually inspect the CMP sensor and projections of camshaft pulley. Are CMP sensor and projections of camshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
18	Inspect the variable tumble control operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is the variable tumble control normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
19	Inspect the EGR system. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is the EGR system normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.

STEP	INSPECTION	RESULTS	ACTION
20	Is the engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle part (ATX) • Clutch (MTX) • EGR valve (mechanical stuck) • Engine mounts • Check valve (two-way)
		No	Inspect for cause.
21	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE[LF, L3]

id0103a6804800

12	LACK/LOSS OF POWER — ACCELERATION/CRUISE
DESCRIPTION	Performance is poor under load (such as power down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Restriction in intake-air system • Intake air temperature too hot • Improper variable intake-air control operation • Improper variable tumble control operation • Improper operation of electronic throttle control system • Purge control solenoid malfunction • Improper EGR valve operation • Brake dragging • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Erratic signal to ignition coil • Engine overheating • Throttle body malfunction • Spark plug malfunction • PCV valve malfunction • Improper valve timing due to jumping out of timing chain • Improper variable valve timing control operation • Restriction in exhaust system • Intermittent open or short in fuel pump related circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Fuel leakage from fuel injector • Fuel injector clogging • Erratic signal from accelerator pedal position sensor • Erratic signal from TP sensor • Intermittent open or short circuit in MAF sensor, Accelerator pedal position sensor, TP sensor, IAT sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • Vacuum connection • Restriction in intake-air system (such as air cleaner element, fresh air duct) • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve • Fuel quality (such as proper octane, contamination, winter/summer blend) Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Is the engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to the next step.
4	Connect the M-MDS to the DLC-2. Access APP1, APP2, RPM, MAF, TP, IAT and VSS PIDs. Drive vehicle while monitoring PIDs. Are PIDs within specifications? (See 01-40A-13 PCM INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**APP1, APP2 PIDs:** Inspect if output signal accelerator pedal position sensor changes smoothly. **RPM PID:** Inspect CKP sensor and related wiring harness for vibration or intermittent open/short circuit or both. **MAF PID:** Inspect for intermittent open circuit of MAF sensor and related wiring harness. **TP PID:** Inspect if output signal TP sensor changes smoothly. **IAT PID:** Inspect for air suction in intake-air system. If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses. **VSS PID:** Inspect for intermittent open circuit of VSS and related wiring harness.
5	Visually inspect the CKP sensor and teeth of crankshaft pulley. Are the CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
6	Inspect the spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	**Spark plug is wet or covered with carbon:** Inspect the fuel injector for fuel leakage. **Spark plug is grayish white:** Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders. Go to the next step.
7	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace PCV valve.
8	Perform electronic throttle control system operation inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.
9	visually inspect deformed exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
10	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position. Is fuel line pressure correct with ignition switch to ON position? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
11	Inspect variable tumble control operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does variable tumble control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
12	Inspect variable intake-air control operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does VIS function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
13	**Note** • The following test is for engine stalling with the A/C on concern. If other symptoms exist, go to the next step. Connect pressure gauge to the A/C low and high side pressure lines. Turn the A/C on and measure low side and high side pressures. Are pressures within specifications? (See 07-10-6 REFRIGERANT PRESSURE CHECK.)	Yes	Go to the next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". (See 01-03A-59 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3].) For other symptoms, inspect the following: • Refrigerant charging amount • Condenser fan operation
14	Inspect for A/C cut-off operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the A/C cut-off function properly?	Yes	Go to the next step.
		No	Inspect A/C cut-off system components.
15	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive the vehicle. Does the engine condition improve?	Yes	Inspect if purge solenoid valve is stuck open mechanically. Inspect the evaporative emission control system. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
		No	Go to the next step.
16	Visually inspect the CMP sensor and projections of camshaft pulley. Are the CMP sensor and projections of camshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
17	Inspect EGR system. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is EGR system normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part according to EGR control system operation inspection results.
18	Inspect the variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the variable valve timing control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to variable valve timing control system inspection results.
19	Is the engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle components (ATX) • Clutch (MTX) • Brake system for dragging
		No	Inspect for cause.

STEP	INSPECTION	RESULTS	ACTION
20	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.13 KNOCKING/PINGING/DETONATION-ACCELERATION/CRUISE[LF, L3]

id0103a6803800

13	KNOCKING/PINGING - ACCELERATION/CRUISE
DESCRIPTION	Sound is heard when air/fuel mixture is ignited by something other than spark plug (such as hot spot in combustion chamber).
POSSIBLE CAUSE	• Engine overheating due to cooling system malfunction • ECT sensor malfunction • IAT sensor malfunction • MAF sensor malfunction • Knock sensor malfunction • Erratic signal from CMP sensor • Inadequate engine compression • Inadequate fuel pressure **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Access ECT PID. Verify ECT PID is **less than 116°C {241°F}** during driving. Is ECT PID less than specification?	Yes	Go to the next step.
		No	Inspect the cooling system for cause of overheating.
2	Connect the M-MDS to the DLC-2. Access IAT and MAF PIDs. Monitor each PID. (See 01-40A-13 PCM INSPECTION[LF, L3].) Are PIDs normal?	Yes	Go to the next step.
		No	**IAT PID**: Inspect IAT sensor **MAF PID**: Inspect MAF sensor
3	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (engine off). Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
4	Is engine compression correct?	Yes	Go to the next step.
		No	Inspect for cause.

STEP	INSPECTION	RESULTS	ACTION
5	Install fuel pressure gauge between fuel pipe and fuel distributor. Start the engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Inspect the ignition timing.
		No	**Low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
6	Inspect the knock sensor. Is the knock sensor normal?	Yes	Inspect ignition timing.
		No	Replace the knock sensor.
7	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.14 POOR FUEL ECONOMY[LF, L3]

id0103a6802000

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	• Contaminated air cleaner element • Variable intake-air control malfunction • Engine cooling system malfunction • Improper ATF level (ATX) • Weak spark • Poor fuel quality • Erratic or no signal from CMP sensor • Clutch slippage (MTX) • Variable tumble control malfunction • Improper variable valve timing control system operation • Improper coolant level • Inadequate fuel pressure • Spark plug malfunction • PCV valve malfunction • Brake dragging • Improper valve timing due to jumping out of timing chain • Contaminated MAF sensor • Improper engine compression • Exhaust system clogging **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Air cleaner element for contamination • ATF level (ATX) • Fuel quality • Coolant level • Brake dragging • Clutch slippage (MTX) Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Access ECT PID. Drive vehicle while monitoring PID. (See 01-40A-13 PCM INSPECTION[LF, L3].) Is PID within specification?	Yes	Go to the next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operations or thermostat operation.
4	Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.
5	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Start the engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
6	Inspect for the variable tumble control operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the variable tumble control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
7	Inspect for variable valve timing control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the variable valve timing control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
8	Inspect for the variable intake-air control operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does variable intake-air control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
9	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
10	visually inspect the exhaust system part. Is there any deformed exhaust system?	Yes	Replace the suspected part.
		No	Go to the next step.
11	Inspect for contaminated MAF sensor. Is there any contamination?	Yes	Go to the next step.
		No	Inspect for cause.
12	Inspect the MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to the next step.
13	Is engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for cause.

STEP	INSPECTION	RESULTS	ACTION
14	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.15 EMISSION COMPLIANCE[LF, L3]

id0103a6802100

15	EMISSION COMPLIANCE
DESCRIPTION	Fails emissions test.
POSSIBLE CAUSE	• Vacuum lines leakage or blockage • Cooling system malfunction • Spark plug malfunction • Leakage from intake manifold • Erratic or no signal from CMP sensor • Inadequate fuel pressure • PCV valve malfunction or incorrect valve installation • EGR valve malfunction • Exhaust system clogging • Fuel tank ventilation system malfunction • Fuel-filler cap malfunction • Charcoal canister damage • Air cleaner element clogging or restriction • Throttle body malfunction • Erratic signal to ignition coil • Improper air/fuel mixture ratio control operation • Bend or open circuit HO2S wiring harness • Catalyst converter malfunction • Engine internal parts malfunction • Excessive carbon is built up in combustion chamber • Improper engine compression • Improper valve timing **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Vacuum lines for leakage or blockage • Electrical connections • Proper maintenance schedule followed • Intake-air system and air cleaner element concerns: obstructions, leakage or dirtiness Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
3	Is any other driveability concern present?	Yes	Go to appropriate symptom troubleshooting.
		No	Go to the next step.
4	Connect the M-MDS to the DLC-2. Access ECT PID. Warm up the engine and idle it. Verify ECT PID is correct. (See 01-40A-13 PCM INSPECTION[LF, L3].) Is ECT PID correct?	Yes	Go to the next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operation or thermostat operation.
5	Inspect fuel-filler cap. (See 01-16A-5 FUEL-FILLER CAP INSPECTION[LF, L3].) Is there any leakage at fuel-filler cap?	Yes	Replace the fuel-filler cap.
		No	Go to the next step.
6	Inspect the front HO2S. (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].) Is front HO2S normal?	Yes	Go to the next step.
		No	Replace the front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
7	Perform spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.
8	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Start the engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Low:** Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
9	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
10	Inspect for fuel saturation inside charcoal canister. Is excess amount of liquid fuel present in canister?	Yes	Replace the charcoal canister.
		No	Inspect the fuel tank vent system. Then, go to the next step. (See 01-14A-12 FUEL TANK INSPECTION[LF, L3].)
11	visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the part.
		No	Go to the next step.
12	Inspect the three-way catalytic converter. (See 01-15A-1 EXHAUST SYSTEM INSPECTION[LF, L3].) Is the three-way catalytic converter normal?	Yes	Inspect the EGR system. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
		No	Replace the three-way catalytic converter.
13	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.16 HIGH OIL CONSUMPTION/LEAKAGE[LF, L3]

id0103a6802200

16	HIGH OIL CONSUMPTION/LEAKAGE
DESCRIPTION	Oil consumption is excessive.
POSSIBLE CAUSE	• PCV valve malfunction • Improper dipstick • Improper engine oil viscosity • Engine internal parts malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
2	Inspect for the following: • External leakage • Proper dipstick • Proper engine oil viscosity Are all items normal?	Yes	Inspect the internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
		No	Service if necessary. Repeat Step 2.
3	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[LF, L3]

id0103a6802300

17	COOLING SYSTEM CONCERNS -OVERHEATING
DESCRIPTION	Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • A/C system operation is improper • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Improper or damaged radiator cap • Cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive chain • Drive belt damage

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following: • Engine coolant level • Coolant leakage • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Overflow system • Fan rotational direction • Fuses Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
3	Start the engine and idle it. *Turn the A/C switch on and set blower fan to any* speed. Does the A/C compressor engage?	Yes	Go to Step 5.
		No	Inspect for the following and repair or replace if necessary: • Refrigerant charging amount • Open circuit in wiring harness between A/C relay and PCM terminal 1I*1, 1AN*2, 1I*3 • Seized A/C magnetic clutch • A/C magnetic clutch malfunction If all items are normal, go to the next step.
4	Start the engine and idle it. Turn the A/C switch on and set blower fan any speed. Measure voltage at PCM terminal 1AP. (See 01-40A-13 PCM INSPECTION[LF, L3].) Is voltage normal?	Yes	Go to the next step.
		No	Inspect the following: • Refrigerant pressure switch operation • The A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 1AU*1, 1AP*2, 1AU*3 • Open circuit of blower motor fan switch and resistor (if blower motor does not operate) • The evaporator temperature sensor and A/C amplifier
5	Inspect cooling fan control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the cooling fan control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
6	Is the drive belt normal?	Yes	Go to the next step.
		No	Replace the drive belt.
7	Is there leakage around the heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to the next step.
8	Is there leakage at the coolant hoses and/or radiator?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
9	Cool down the engine. Remove thermostat and inspect operation. (See 01-12A-8 THERMOSTAT REMOVAL/ INSTALLATION[LF, L3].) (See 01-12A-8 THERMOSTAT INSPECTION[LF, L3].) Is thermostat normal?	Yes	The engine coolant temperature and thermostat are normal, inspect engine block for leakage or blockage.
		No	Access ECT PID. Inspect for both ECT PID and temperature gauge readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
10	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.18 COOLING SYSTEM CONCERNS-RUNS COLD[LF, L3]

id0103a6802400

18	COOLING SYSTEM CONCERNS-RUNS COLD
DESCRIPTION	Engine takes excessive time to reach normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to the next step.
2	Does the engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on". (See 01-03A-35 NO.9 FAST IDLE/RUNS ON[LF, L3].)
		No	Go to the next step.
3	Remove the thermostat and inspect operation. (See 01-12A-8 THERMOSTAT REMOVAL/ INSTALLATION[LF, L3].) (See 01-12A-8 THERMOSTAT INSPECTION[LF, L3].) Is thermostat normal?	Yes	Go to the next step.
		No	Replace the thermostat.
4	Inspect cooling fan control system operation. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Does the cooling fan control system function properly?	Yes	Access ECT PID. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If the temperature gauge on the instrument cluster indicates normal range but ECT PID is not the same as temperature gauge reading, inspect the ECT sensor. If the temperature gauge on the instrument cluster indicates cold range but ECT PID is normal, inspect the temperature gauge and heat gauge unit.
		No	Repair or replace the malfunctioning part.
5	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.19 EXHAUST SMOKE[LF, L3]

id0103a6803900

19	EXHAUST SMOKE
DESCRIPTION	Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	**Blue smoke (Burning oil):** • PCV valve malfunction • Engine internal oil leakage **White smoke (Water in combustion):** • Cooling system malfunction (coolant loss) • Engine internal coolant leakage **Black smoke (Rich fuel mixture):** • Air cleaner restriction • Intake-air system is collapsed or restricted. • Fuel return line is restricted. • Excessive fuel pressure • Improper engine compression • Injector fuel leakage • Ignition system malfunction **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from the exhaust system?	Blue	Burning oil is indicated. Go to the next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Inspect for the following: • Damaged valve guide, stems or valve seals • Blocked oil drain passage in cylinder head • Piston ring is not seated, seized or worn. • Damaged cylinder bore If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace the PCV valve.
3	Does the cooling system hold pressure?	Yes	Inspect for the following: • Cylinder head gasket leakage • Intake manifold gasket leakage • Cracked or porous engine block If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Inspect for cause.
4	Inspect for the following: • Air cleaner restriction • Collapsed or restricted intake-air system • Restricted fuel return line Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 4.

STEP	INSPECTION	RESULTS	ACTION
5	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
6	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Start the engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Low:** • Inspect the fuel line for clogging. • If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** • Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
7	Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Inspect the CMP sensor. (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].)
		No	Repair or replace the malfunctioning part according to spark test result.
8	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.20 FUEL ODOR (IN ENGINE COMPARTMENT)[LF, L3]

id0103a6802600

20	FUEL ODOR (IN ENGINE COMPARTMENT)
DESCRIPTION	Gasoline fuel smell or visible leakage
POSSIBLE CAUSE	• Excessive fuel pressure • Purge solenoid valve malfunction • Fuel tank vent system blockage • Charcoal canister malfunction • Fuel leakage from fuel system **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service if necessary. Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Start engine and idle it. Measure fuel line pressure during idle. Is fuel line pressure correct during idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
2	Inspect for blockage/restriction or open circuit in wiring harness between the engine vacuum port and the charcoal canister. Inspect for blockage in fuel tank vent system. Is malfunction indicated?	Yes	Replace vacuum hose.
		No	Go to the next step.
3	Inspect the purge solenoid valve. (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].) Is the solenoid operating properly?	Yes	Go to the next step.
		No	Replace the purge solenoid valve. (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3].)
4	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Inspect charcoal canister for fuel saturation. If excess amount of liquid fuel is present, replace the charcoal canister.
5	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.21 ENGINE NOISE[LF, L3]

id0103a6802700

21	ENGINE NOISE
DESCRIPTION	Engine noise from under hood
POSSIBLE CAUSE	**Squeal, click or chirp noise:** • Improper engine oil level • Improper drive belt tension • Generator installation (alignment) • Splash shield or under cover looseness (splashed water to drive belts) **Rattle sound noise:** • Loose parts **Hiss sound noise:** • Vacuum leakage • Loose spark plug • Air leakage from intake-air system **Rumble or grind noise:** • Improper drive belt tension • Improper P/S fluid level **Rap or roar noise:** • Dynamic dumper looseness • Exhaust system looseness • Intake-air system looseness **Other noise:** • Camshaft friction gear noise or MLA noise • Timing chain noise

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is a squealing, click or chirping sound present?	Yes	Inspect for the followings: • Engine oil level • Drive belt tension • Splash shield or under cover looseness • Generator installation (alignment)
		No	Go to the next step.
2	Is a rumbling or grinding noise present?	Yes	Inspect for the followings: • Drive belt tension • P/S fluid level
		No	Go to the next step.
3	Is a rattling noise present?	Yes	Inspect rattling location for loose parts.
		No	Go to the next step.
4	Is a hissing noise present?	Yes	Inspect for the following: • Vacuum leakage • Spark plug looseness • Intake-air system leakage
		No	Go to the next step.
5	Is a rapping or roar noise present?	Yes	Inspect looseness for followings: • Dynamic dumper • Intake-air system • Exhaust system
		No	Go to the next step.
6	Is a knocking noise present?	Yes	Go to symptom troubleshooting "No.11 Knocking/ pinging". (See 01-03A-45 NO.13 KNOCKING/PINGING/ DETONATION-ACCELERATION/CRUISE[LF, L3].)
		No	If the noise comes from the engine internal, inspect for friction gear, timing chain or MLA noise.
7	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.22 VIBRATION CONCERNS (ENGINE)[LF, L3]

id0103a6802800

22	VIBRATION CONCERNS (ENGINE)
DESCRIPTION	• Vibration from under hood or driveline
POSSIBLE CAUSE	• Loose attaching bolts or worn parts • Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following components for loose attaching bolts or worn parts: • Cooling fan • Drive belt and pulleys • Generator • Engine mounts • Exhaust system mounts All items normal?	Yes	Inspect the following systems: • Wheels • ATX • Driveline • Suspension
		No	Readjust or retighten engine mount installation position. Service if necessary for other parts.
2	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.23 A/C DOES NOT WORK SUFFICIENTLY[LF, L3]

id0103a6802900

23	A/C DOES NOT WORK SUFFICIENTLY.
DESCRIPTION	A/C compressor magnetic clutch does not engage when the A/C switch is turned on.
POSSIBLE CAUSE	• Improper refrigerant charging amount • Open the A/C magnetic clutch • Open circuit in wiring harness between A/C relay and A/C magnetic clutch • Poor GND of A/C magnetic clutch • Refrigerant pressure switch is stuck open. • A/C relay is stuck open. • Seized A/C compressor • Open circuit in wiring harness between A/C switch and PCM through both refrigerant pressure switch and A/C amplifier

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
2	Disconnect A/C compressor connector. Start engine and turn A/C switch on. Is there correct voltage at A/C compressor magnetic clutch terminal? **Specification** **10.5 V or more**	Yes	Inspect for GND condition of magnetic clutch on A/C compressor. If GND condition is normal, inspect for open circuit magnetic clutch coil.
		No	Go to the next step.
3	Disconnect refrigerant pressure switch connector. Connect jumper wiring between A/C high pressure switch terminal. Connect jumper wiring between refrigerant pressure switch terminal. Turn the ignition switch to the ON position. Turn A/C switch on and set blower fan to any speed. Does A/C work?	Yes	Inspect refrigerant pressure switch operation. If switch is normal, go to the next step.
		No	Inspect for the following: • A/C switch is stuck open. • Open circuit in wiring harness between refrigerant pressure switch and PCM terminal 1AU*1, 1AP*2, 1AU*3 • Open circuit in wiring harness between blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier
4	Remove jumper wiring from the switch connector. Reconnect connector to refrigerant pressure switch. Start the engine and turn the A/C switch on. Does the fan operate?	Yes	Inspect whether A/C relay is stuck open. Replace if necessary.
		No	Inspect the following and repair or replace if necessary: • Refrigerant charging amount • A/C compressor for seizure
5	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[LF, L3]

id0103a6803000

24	A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
DESCRIPTION	A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	• A/C compressor magnetic clutch engagement is stuck. • A/C relay is stuck closed. • Short to GND in wiring harness between A/C switch and PCM • Short to GND in wiring harness between A/C relay and PCM • Short circuit to battery power in A/C relay to magnetic clutch

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
2	Start the engine and idle it. Turn the A/C switch on. Remove the A/C relay. Does the A/C magnetic clutch disengage?	Yes	Inspect for the following: • A/C relay is stuck closed. • Short to GND in wiring harness between A/C relay and PCM terminal 1AN. If both items normal, go to the next step.
		No	Inspect if circuit between the A/C relay and magnetic clutch shorts to battery power circuit. If the circuit is normal, inspect the magnetic clutch for stuck engagement or clearance.
3	Disconnect refrigerant pressure switch connector. Start the engine and turn A/C switch on. **Note** • A/C should not work when disconnecting connector. If A/C remains working, short to GND circuit may be present. Does the A/C remain working?	Yes	Inspect for short to GND in wiring harness between refrigerant pressure switch and PCM terminal 1AU*1, 1AP*2, 1AU*3.
		No	Go to the next step.
4	Reconnect refrigerant pressure switch connector. Turn off A/C switch. **Note** • A/C should not work when turning A/C switch off. If A/C remains working, short to GND circuit may be present. Does A/C remain working?	Yes	Inspect following: • Short to GND in wiring harness between A/C switch and A/C amplifier • Short to GND circuit between A/C amplifier and refrigerant pressure switch
		No	Inspect whether A/C switch is stuck closed.
5	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS[LF, L3]

id0103a6803100

25	A/C IS NOT CUT off UNDER WOT CONDITIONS.
DESCRIPTION	A/C compressor magnetic clutch does not disengage under WOT.
POSSIBLE CAUSE	• Accelerator pedal position sensor malfunction • Accelerator pedal position sensor misadjustment • Loosely installed accelerator pedal position sensor

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does A/C compressor disengage when the A/C switch is turned off?	Yes	Go to the next step.
		No	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Inspect accelerator pedal position sensor.
3	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.26 EXHAUST SULPHUR SMELL[LF, L3]

id0103a6803200

26	EXHAUST SULPHUR SMELL
DESCRIPTION	Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	• Electrical connectors are disconnected or connected poorly • Charcoal canister malfunction • Vacuum lines are disconnected or connected improperly. • Improper fuel pressure • Poor fuel quality **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** **• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** **• Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any drivability or exhaust smoke concerns present?	Yes	Go to the appropriate flow chart.
		No	Go to the next step.
2	Inspect the following: • Electrical connections • Vacuum lines • Fuel quality Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.
3	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
4	Install the fuel pressure gauge between the fuel pipe and the fuel distributor. Start engine and idle it. Is fuel line pressure correct at idle? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Low:** Inspect fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
5	Inspect the charcoal canister for fuel saturation. Is excess amount of liquid fuel present in canister?	Yes	Replace the charcoal canister.
		No	Inspect the fuel tank vent system. If the fuel tank vent system is normal, suggest trying a different brand since sulfur content can vary in different fuels. If the fuel tank vent system is not normal, repair or replace the malfunctioning part.
6	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.27 FUEL REFILL CONCERNS[LF, L3]

id0103a6803300

27	FUEL REFILL CONCERNS
DESCRIPTION	• Fuel tank is not filled smoothly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Improper use of fuel nozzle • Inadequate fuel filling speed **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** — **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** — **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
2	Remove the fuel-filler pipe. Make sure the nonreturn valve is installed properly. Inspect nonreturn valve operation. Is the nonreturn valve normal?	Yes	Inspect for the following: • Improper use of fuel nozzle • Inadequate fuel filling speed
		No	**Nonreturn valve is installed improperly:** • Reinstall nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace nonreturn valve.
3	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.28 FUEL FILLING SHUT OFF CONCERNS[LF, L3]

id0103a6912000

28	FUEL FILLING SHUT OFF CONCERNS
DESCRIPTION	• Fuel does not shut off properly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Fuel shut-off valve malfunction • Fuel nozzle malfunction • Fuel nozzle is not inserted correctly. **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	**No DTC is displayed:** Go to the next step.
2	Remove the fuel-filler pipe. Make sure the nonreturn valve is installed properly. Inspect nonreturn valve operation. Is the nonreturn valve normal?	Yes	Inspect for the following: • Improper use of fuel nozzle • Fuel is not inserted correctly. • Inspect fuel shut-off valve.
		No	**Nonreturn valve is installed improperly:** • Reinstall the nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace the nonreturn valve.
3	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.29 SPARK PLUG CONDITION[LF, L3]

id0103a6803600

29	SPARK PLUG CONDITION
DESCRIPTION	Incorrect spark plug condition
POSSIBLE CAUSE	**Note** • Inspecting spark plugs condition can determine whether problem is related to a specific cylinder or possibly all cylinders. **Wet/carbon stuck on specific plug:** • Spark—Weak, not visible • Air/fuel mixture—Excessive fuel injection volume • Compression—No compression, low compression • Malfunction spark plug **Grayish white with specific plug:** • Air/fuel mixture—Insufficient fuel injection volume • Malfunction spark plug **Wet/carbon is stuck on all plugs:** • Spark—Spark weak • Air/fuel mixture—Too rich • Compression—Low compression • Clogging in intake/exhaust system **Grayish white with all plugs:** • Air/fuel mixture—Too lean **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.** **(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)** **(See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)** **Caution** • **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove all the spark plugs. Inspect spark plug condition. Is spark plug condition normal?	Yes	Troubleshooting completed.
		No	**Specific plug is wet or covered with carbon:** Go to the next step. **Specific plug looks grayish white:** Go to Step 7. **All plugs are wet or covered with carbon:** Go to Step 9. **All plugs look grayish white:** Go to Step 15.
2	Are the spark plug wet/covered with carbon by the engine oil?	Yes	Inspect all areas related to oil, working up and down.
		No	Go to the next step.
3	Inspect the spark plug for the following: • Cracked insulator • Heat range • Air gap • Worn electrode Is the spark plug normal?	Yes	Go to the next step.
		No	Replace the spark plug. (See 01-18A-3 SPARK PLUG REMOVAL/ INSTALLATION[LF, L3].)
4	Inspect compression pressure at suspected malfunctioning cylinder. Is compression pressure correct? (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.

STEP	INSPECTION	RESULTS	ACTION
5	Install all spark plugs. Perform the spark test at suspected malfunctioning cylinder. Is strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
6	Install the fuel pressure gauge between fuel filter and fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position (Engine off). Is the fuel line pressure correct with the ignition switch at ON? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Inspect fuel injector for the following: • Open or short circuit in injector • Leakage • Injection volume
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
7	Inspect the spark plug for the following. • Heat range • Air gap Is the spark plug normal?	Yes	Go to the next step.
		No	Replace the spark plug. (See 01-18A-3 SPARK PLUG REMOVAL/ INSTALLATION[LF, L3].)
8	Remove the suspected fuel injector. Inspect the following: • Resistance (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) • Fuel injection volume (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].) Are all above items normal?	Yes	Inspect for open circuit in wiring harness between fuel injector connector terminal A and PCM at the following terminals: • **For No.1 cylinder: 2AW*1, 2BB*2, 2BA*1, 2BE*2, 2BA*3** • **For No.2 cylinder: 2AS*1, 2BC*2, 2AW*1, 2BF*2, 2AW*3** • **For No.3 cylinder: 2AX*1, 2BD*2, 2AX*1, 2BG*2, 2AX*3** • **For No.4 cylinder: 2AT*1, 2AZ*2, 2AT*1, 2BH*2, 2AT*3**
		No	Replace the fuel injector.
9	Is the air cleaner element free of clogging?	Yes	Go to the next step.
		No	Replace the air cleaner element.
10	Perform the spark test. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
11	Install the fuel pressure gauge between the fuel filter and fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position (Engine off). Is the fuel line pressure correct with ignition switch at ON? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Go to the next step.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
12	Inspect the following PIDs: • ECT • O2S11 (When engine can be started.) • O2S12 (When engine can be started.) • O2S13*1 (When engine can be started.) • MAF (See 01-40A-13 PCM INSPECTION[LF, L3].) Are PIDs normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.

STEP	INSPECTION	RESULTS	ACTION
13	Perform the purge control inspection. (When engine can be started.) (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].) Is the purge control correct?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
14	Perform compression inspection. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) Is compression correct?	Yes	Visually inspect for deformed exhaust system part.
		No	Repair or replace the malfunctioning part.
15	When the engine cannot be started, inspect the intake-air system for air leakage. When the engine can be started, perform intake manifold vacuum inspection. Is air sucked in from intake-air system?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
16	Install the fuel pressure gauge between the fuel filter and the fuel distributor. Short check connector terminal F/P to body GND using a jumper wiring. Turn the ignition switch to the ON position (Engine off). Is fuel line pressure correct with the ignition switch at ON? (See 01-14A-6 FUEL LINE PRESSURE INSPECTION[LF, L3].)	Yes	Inspect the following PIDs: • ECT • O2S11 • O2S12 • O2S13*1 • MAF (See 01-40A-13 PCM INSPECTION[LF, L3].) Inspect PCM GND condition.
		No	**Zero or low:** Inspect the fuel pump relay and fuel pump circuit. Inspect the fuel line for clogging. If there is no malfunction, replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].) **High:** Replace the fuel pump unit. (See 01-14A-14 FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3].)
17	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3]

id0103a6800400

Vibration Method

- If malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

Note

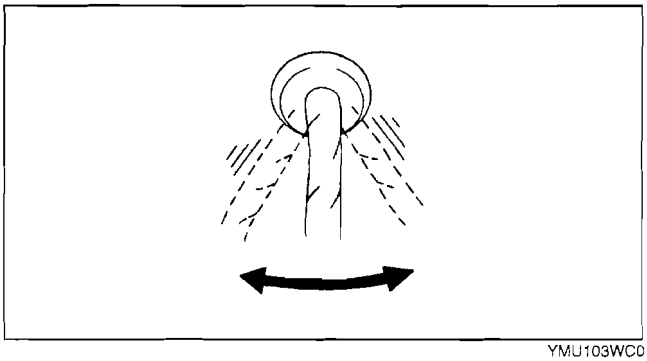
- There are several reasons vehicle or engine vibration could cause an electrical malfunction. Inspect the following:
  - — Connectors not fully seated
  - — Wiring harnesses not having full play
  - — Wiring harnesses laying across brackets or moving parts
  - — Wiring harnesses routed too close to hot parts
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harnesses pass such as through the firewall and body panels are the major areas to be checked.

Inspection Method for Switch Connectors or Wiring Harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Turn the switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If PID value is unstable, inspect for poor connection.



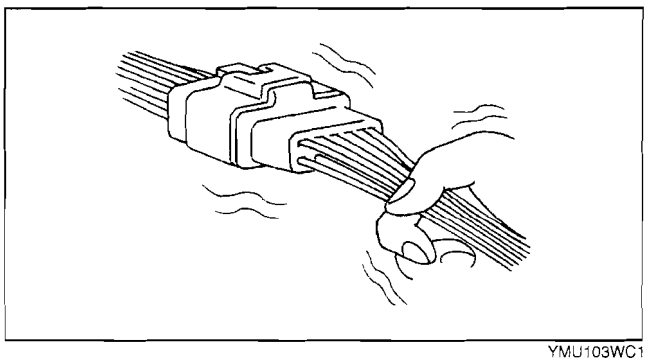
YMU103WC0

Inspection Method for Sensor Connectors or Wiring Harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If PID value is unstable, inspect for poor connection.



YMU103WC1

Inspection Method for Sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps during idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If PID value is unstable or malfunction occurs, check for poor connection or poorly mounted sensor or both.

Inspection Method for Actuators or Relays

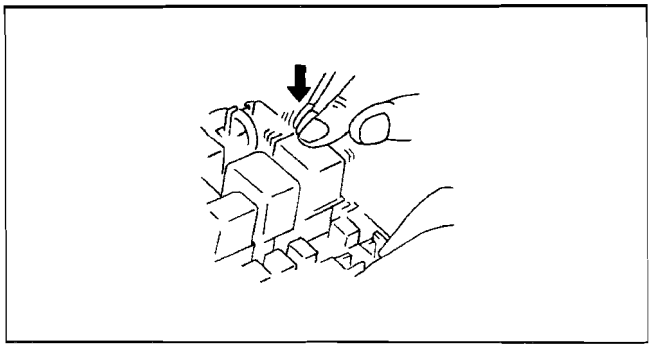
1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps during idle.

3. Prepare the output state control function for actuators or relays that you are inspecting.

4. Vibrate the actuator or relay with your finger for **3 s** after output state control function is activated.
   - If variable click sound is heard, check for poor connection or poorly mounted actuator or both, or the relay.

Note
- Vibrating relays too strongly may result in open relays.



YMU103WC2

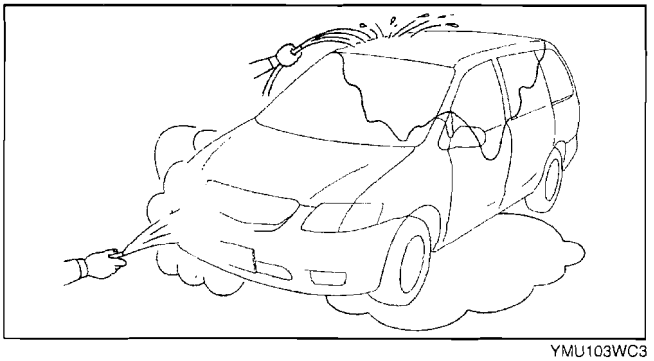
Water Sprinkling Method
If malfunction occurs only under high humidity or rainy/snowy weather, perform the following steps:

Caution
- **Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**
- **If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.**

1. Connect the M-MDS to the DLC-2 if you are inspecting sensors or switches.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for sensor or switch if you are inspecting sensors or switches.
4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
   - If PID value is unstable or malfunction occurs, repair or replace part if necessary.



YMU103WC3

ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3]

id0103a6803700

Input Signal System Inspection Procedure
1. Find an irregular signal. (See 01-03A-68 Finding irregular signals.)
2. Locate source. (See 01-03A-69 Locating the source of unusual signals.)
3. Repair or replace the malfunctioning part.
4. Confirm that the irregular signal is no longer detected.

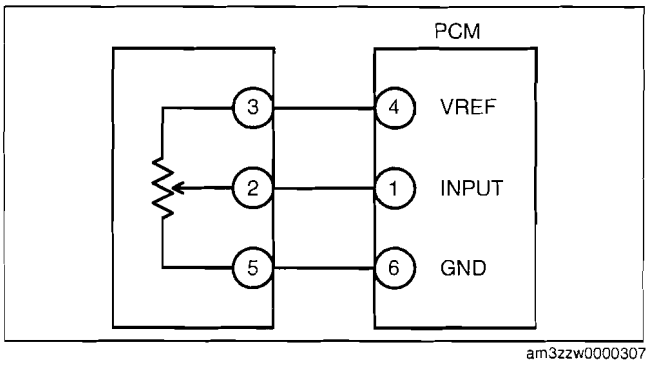
Finding irregular signals
While referring to 01-02A-14 ON-BOARD DIAGNOSTIC TEST[LF, L3], use the PID/DATA monitor and record function to inspect the input signal system relating to the problem.
1. Start the engine and idle the vehicle. You can assume that any signals that are out of specification by a wide margin are irregular.
2. When recreating the problem, any sudden change in monitor input signals that is not intentionally created by the driver can be determined as irregular.

Locating the source of unusual signals

Caution

- **Compare the M-MDS monitor voltage with the measurement voltage using the digital measurement system function. If you use another tester, misreading may occur.**
- **When measuring voltage, attach the tester GND to the GND of the PCM that is being tested, or to the engine itself. If this is not performed, the measured voltage and actual voltage may differ.**
- **After connecting the pin to a waterproof coupler, confirming continuity and measuring the voltage, inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the wiring harness or terminal from water damage, leading to problems with the vehicle.**

Variable resistance type 1 (TP sensor and EGR boost sensor)



am3zzw0000307

Input signal system inspection for variable resistance type 1

1. When an irregular signal is detected, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and the M-MDS voltages are the same, inspect for the following points concerning the sensor connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
   - If there are no problems, proceed to next investigation below.

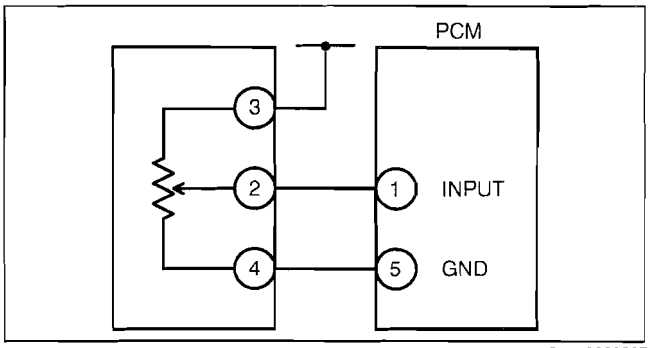
Standard power supply system inspection for variable resistance type 1

- Confirm that the #3 terminal is at **5 V**.
  — If the measured voltage on the #3 terminal is **5 V**, inspect the following points on the sensor connector.
  — If there is no problem, inspect for the following:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  — If the #3 terminal measures other than **5 V**, inspect for the following:
    - Open or short circuit in wiring harness
    - Harness/pin crimp is loose or disconnected.

GND system inspection for variable resistance type 1

- Confirm that terminal sensor #5 is at **0 V**.
  — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  — If not, inspect for the following:
    - Open or short circuit in wiring harness
    - Female terminal opening is loose causing an open or short circuit in wiring harness
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

Variable resistance type 2 (mass air flow (MAF) sensor and VSS)



am3zzw0000307

GND system inspection for variable resistance type 2

- Confirm that terminal sensor #4 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not at **0 V**, inspect for the following:
    - Open circuit in wiring harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

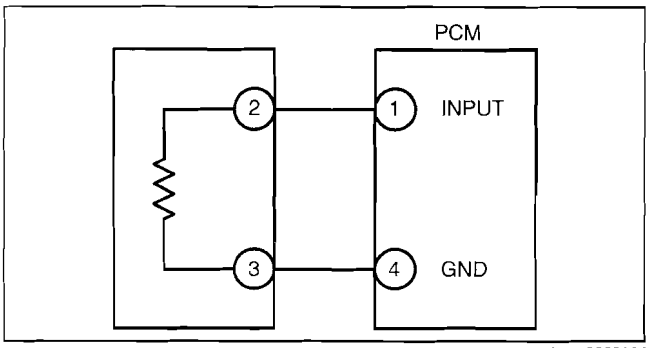
Input signal system inspection for variable resistance type 2

1. When an irregular signal is detected, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and the M-MDS voltages are the same, inspect the following points concerning the sensor connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Electrical supply system inspection for variable resistance type 2

- Confirm that the sensor #3 terminal is **B+**.
  - — If the measured voltage on the #3 terminal is **B+**, inspect the following points on the sensor connector.
  - — If there is no problem, inspect for the following:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  - — If the #3 terminal measures other than **B+**, inspect the following:
    - Open or short circuit in wiring harness
    - Harness/pin crimp is loose or disconnected.

Thermistor type (IAT sensor and ECT sensor)



am3zzw0000307

Input signal system inspection for thermistor type

1. When an irregular signal is detected, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect the following points concerning the PCM connector:
     — Female terminal opening loose
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and the M-MDS voltages are the same, inspect the following points concerning the sensor connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

GND system inspection for thermistor type

- Confirm that terminal sensor #3 is at **0 V**.
  — If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
  — If not, inspect for the following:
    - Open circuit in wiring harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

Main Relay Operation Inspection

1. Verify that the main relay clicks when the ignition switch is turned to ON position and off.
   - If there is no operation sound, inspect the following:
     — Main relay (See 09-21-3 RELAY INSPECTION.)
     — Harness and connector between ignition switch and main relay terminal A.
     — Harness and connector between PCM terminal 1AT and main relay terminal B.

Intake Manifold Vacuum Inspection

1. Verify air intake hoses are installed properly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum hose between the intake manifold and purge solenoid valve from the intake manifold side.

4. Connect a vacuum gauge to the intake manifold and measure the intake manifold vacuum.
   - If not as specified, inspect the following:

Specification (LF)
ATX: More than 55 kPa {413 mmHg, 16 inHg}
MTX: More than 57 kPa {428 mmHg, 17 inHg}

Specification (L3)
ATX: More than 57 kPa {428 mmHg, 17 inHg}
MTX: More than 60 kPa {451 mmHg, 18 inHg}

Note
- Air suction can be located by engine speed change when lubricant is sprayed on the area where suction is occurring.
  — Air suction at throttle body, intake manifold and PCV valve installation points
  — EGR valve (stuck open)
  — Fuel injector insulator
  — Engine compression
  (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)

Electronic Throttle Control System Inspection
Engine coolant temperature compensation inspection
1. Connect the M-MDS to the DLC-2.
2. Access the following PIDs:
   - ECT
   - IAT
   - RPM
3. Verify that the engine is cold, then start the engine.
4. Verify that the engine speed decreases as the engine warms up.
   - If the engine speed does not decrease or decreases slowly, inspect the following:
     — ECT sensor and related wiring harness
     (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].)
     — Electronic throttle body and related wiring harness
     (See 01-13A-7 THROTTLE BODY INSPECTION[LF, L3].)

Load compensation inspection
1. Start the engine and idle it.
2. Connect the M-MDS to the DLC-2.
3. Verify that P0506, P0507, or P0511 is not displayed.
   - If P0506, P0507 or P0511 are displayed, perform DTC inspection.
   (See 01-02A-22 DTC TABLE[LF, L3].)
4. Access the RPM PID.

Note
- Excludes temporary idle speed drop just after the loads are turned on.

5. Verify that the engine speed is within the specification under each load condition.
   - If load condition is not as specified, inspect the following:
     — A/C switch and related wiring harness
     (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER], 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].)
     — Fan switch and related wiring harness
     (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER], 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].)

Engine speed

Load condition		Engine speed (rpm)*1	
		MTX	ATX
No load		600—700	650—750
E/L operating*2	38—48 A	650—750	
	more than 48 A	700—800	
A/C operating*3	Refrigerant pressure low*4	700—800	650—750
	Refrigerant pressure high*5	700—800	670—770

*1 : Neutral or P position
*2 : Generator generating current value
*3 : A/C switch and fan switch are on.
*4 : Refrigerant pressure switch (middle pressure) is off.
*5 : Refrigerant pressure switch (middle pressure) is on.

Throttle position (TP) sweep inspection

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Verify that none of the following DTC are displayed:
   - P0122, P0123, P0222, P0223, P0638, P2100*2, P2101, P2102*2, P2103*2, P2106*1, P2107, P2108, P2109*1, P2112*1, P2119, P2122, P2123, P2127, P2128, P2135, P2138

     *1: California emission regulation applicable model

     *2: Except for California emission applicable model
   - — If any one DTC is displayed, perform DTC inspection.
4. Access TP_REL PID.
5. Verify that the PID reading is within the CTP value. (See 01-40A-13 PCM INSPECTION[LF, L3].)
   - If the PID reading is out of range, perform the following:
     - — Remove the air duct from the throttle valve body.
     - — Verify that the throttle valve opens when the accelerator pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and related wiring harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and related wiring harness.
6. Gradually depress the throttle pedal and verify that the PID reading increases accordingly.
   - If the PID reading drops momentarily, inspect the following:
     - — Throttle position sensor
7. Fully depress the throttle pedal and verify that the PID reading is within WOT value. (See 01-40A-13 PCM INSPECTION[LF, L3].)
   - If the PID reading is out of range, perform the followings:
     - — Remove the air duct from throttle valve body.
     - — Verify that the throttle valve opens when throttle pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and related wiring harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and related wiring harness.

Variable Intake-air Control Operation Inspection

1. Start the engine.
2. Inspect the rod operation under the following condition:

Rod operation (LF)

Engine speed	4,750 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

Rod operation (L3)

Engine speed	4,600 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not as specified, inspect as follows:

(1) Stop the engine.
(2) Connect the M-MDS to the DLC-2.

(3) Verify that DTC P0661 or P0662 is not displayed.
- If DTC P0661 or P0662 is shown, perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)

(4) Inspect the variable intake-air solenoid valve. (See 01-13A-8 VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION[LF, L3].)
- If the variable intake-air solenoid valve is not normal, replace the variable intake-air solenoid valve. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
- If the variable intake-air solenoid valve is normal, inspect the following:
  — Vacuum hose and vacuum chamber for looseness or damage
  — Shutter valve actuator (See 01-13A-10 VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].)
  — Shutter valve stuck open or closed

Variable Tumble Control Operation Inspection

1. Connect the M-MDS to the DLC-2.
2. Access ECT PID.
3. Verify that ECT PID is **below 61.9 °C {143.4 °F} (LF), below 63 °C {145 °F} (L3).**
4. Start the engine.
5. Inspect rod operation under the following conditions:

Rod operation

Engine speed	3,750 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not specified, inspect as follows:

(1) Verify that DTC No. P2004, P2006, P2009 or P2010 is not displayed.
- If DTC No. P2004, P2006, P2009 or P2010 are shown, perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)

(2) Inspect the variable tumble solenoid valve. (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].)
- If the variable tumble solenoid valve is not normal, replace the variable tumble solenoid valve. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
- If the variable tumble solenoid valve is normal, inspect the following:
  — Vacuum hose and vacuum chamber for looseness or damage
  — Shutter valve actuator (See 01-13A-10 VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].)
  — Shutter valve stuck open or closed

Fuel Injector Operation Inspection

STEP	INSPECTION	RESULTS	ACTION
1	While cranking the engine, inspect for fuel injector operation sound at each cylinder using a soundscope. Is operation sound heard?	Yes	Fuel injector operation is normal.
		No	**All cylinders not heard:** Go to the next step. **Some cylinders not heard:** Go to Step 3.
2	Perform main relay operation inspection. Is main relay operation normal?	Yes	Inspect the following: • Fuel injector power system related wiring harness and connectors • PCM connectors • Fuel injector GND and related wiring harness and connectors
		No	Repair or replace malfunctioning parts.
3	Switch fuel injector connector of not operating fuel injector with operating fuel injector. Is operation sound heard?	Yes	Go to the next step.
		No	Replace the fuel injector.
4	Are wiring harness and connectors of not operation fuel injector normal? (Open or short)	Yes	Inspect PCM terminal voltage of fuel injector signal.
		No	Repair or replace malfunctioning parts.

Fuel Cut Control System Inspection

1. Warm up engine and idle it.
2. Turn off the electrical loads and A/C switch.
3. Connect the M-MDS to the DLC-2.
4. Access RPM PID.
5. Listen for the fuel injector operation sound at all cylinders using the soundscope and monitor both PIDs while performing the following steps:
   (1) Depress the accelerator pedal and increase the engine speed to **4,000 rpm**.
   (2) Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the fuel injector operation sound stops, and starts again when the engine speed drops below **2,200 rpm**.
   - If not as specified, inspect the following:
     — ECT sensor and related wiring harness
     (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].)
     — Neutral/clutch pedal position switch and related wiring harness (MTX)
     (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].)
     — TR switch and related wiring harness (ATX)
     (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL], 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)

Fuel Pump Operation Inspection

1. Remove the fuel-filler cap.
2. Turn the ignition switch to the ON position.
3. Turn the fuel pump relay from off to on using the FP PID and inspect if the operation sound is heard.
   - If no operation sounds is heard, proceed to next step.
4. Measure voltage at wiring harness side fuel pump connector terminal C (California emission regulation applicable model), A (except for California emission regulation applicable model).

Specification
B+ (Ignition switch at on)

- If the voltage is as specified, inspect the following:
  — Fuel pump continuity
  — Fuel pump GND
  — Wiring harness between fuel pump relay and PCM terminal 1AR (with immobilizer system), 1AQ (without immobilizer system)
- If not as specified, inspect the following:
  — Fuel pump relay
  — Wiring harness connector (Main relay – fuel pump relay – fuel pump.)

Fuel Pump Control System Inspection

1. Crank the engine and verify that fuel pump relay operation sound is heard.
2. If operation sound is not heard, inspect the following:
   - Fuel pump relay
   (See 09-21-3 RELAY INSPECTION.)
   - Wiring harness and connectors (Main relay – fuel pump relay – PCM terminal 1AR (with immobilizer system), 1AQ (without immobilizer system)

Spark Test

1. Disconnect the fuel pump relay.
2. Verify that each ignition coil and connector is connected properly.
3. Inspect the ignition system in the following procedure.

Warning

- **High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.**

STEP	INSPECTION		ACTION
1	• Disconnect the ignition coil from the spark plugs. • Remove the spark plugs. • Verify that the spark plugs do not have carbon deposits. • Are the spark plugs normal?	Yes	Go to the next step.
		No	Perform no-load racing at 4,000 rpm for 2 min, 2 times to burn off the carbon deposits. Repeat Step 1.

STEP	INSPECTION		ACTION
2	• Inspect the spark plugs for damage, wear, and proper plug gap. • Are the spark plugs normal?	Yes	Go to the next step.
		No	Replace spark plugs, then go to the next step.
3	• Reconnect the spark plugs to the ignition coil. • Ground the spark plugs to the engine. • Is a strong blue spark visible at each cylinder while cranking the engine?	Yes	Ignition system is normal.
		No	**Some cylinders do not spark:** • Go to the next step. **All cylinders do not spark:** • Go to Step 5.
4	• Inspect the following wiring harnesses for open or short: — Ignition coil No.1 terminal B—PCM terminal 2BE — Ignition coil No.2 terminal B—PCM terminal 2BF — Ignition coil No.3 terminal B—PCM terminal 2BG — Ignition coil No.4 terminal B—PCM terminal 2BH • Are the wiring harnesses normal?	Yes	Inspect and replace the ignition coil. (See 01-18A-2 IGNITION COIL INSPECTION[LF, L3].)
		No	Repair or replace the malfunctioning part, then go to Step.1.
5	• Measure the voltage at terminal A in each ignition coils. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect power supply circuit of ignition coils.
6	• Does the PCM connector or ignition coil connectors have poor connection?	Yes	Repair or replace the connector, then go to Step.1.
		No	Go to the next step.
7	• Are the following parts normal? — CKP sensor and crankshaft pulley	Yes	Inspect for open or short circuit in wiring harness and connector of CKP sensor.
		No	Repair or replace the malfunctioning part, then go to Step.1.

EGR Control System Inspection

1. Crank the engine and verify that EGR valve operation (initial operation) sound is heard.
   - If the operation sound is not heard, connect the M-MDS to the DLC-2 and verify that the DTC P0403 is shown. Perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
2. Start the engine and idle it.
3. Warm up the engine to normal operating temperature.
4. Access the following PIDs:
   - ECT, RPM, SEGRP_DSD, APP1, APP2, VSS
5. Idle the vehicle and verify that the SEGRP value is 0.
6. Put the vehicle in drive.
7. Depress the accelerator pedal and verify that the SEGRP_DSD value is increased.
   - If the EGR valve increases, inspect the following:
     — EGR valve (stuck open or close)
     — Wiring harness and connectors (Main relay – EGR valve – PCM)
   - If the SEGRP_DSD value does not increase, inspect the VSS, APP1, APP2, TP and ECT PIDs. (See 01-40A-13 PCM INSPECTION[LF, L3].)
8. Stop the vehicle and verify that the SEGRP value returns to 0.

Purge Control System Inspection

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
   - If there is a vacuum, inspect the following:
     — Wiring harness and connectors (Purge solenoid valve—PCM terminal 2AN)
     — Purge solenoid valve
4. Warm up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect the M-MDS to the DLC-2 and verify that the DTC P0443 is shown. Perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
7. Turn the ignition switch to the ON position.
8. Access ECT PID.
9. Verify that the engine coolant temperature is **more than 78 °C {173 °F}**.
   - If the M-MDS indicates **less than 78 °C {173 °F}**, perform the ECT sensor inspection.

10. Set the vehicle on the dynamometer or chassis roller.

Warning

- **When the dynamometer or chassis roller is operating, there is a possibility that the operator may come into contact with or be caught up in the rotating parts, leading to serious injuries or death. When performing work while the dynamometer or chassis roller is operating, be careful not to come into contact with or be caught up in any of the rotating parts.**

11. Drive vehicle at engine speed **approx. 2000 rpm** for **30 s or more.**
12. Put a finger to the purge solenoid valve and verify that there is no vacuum applied while step 2.
    - If there is no vacuum, inspect the following:
      — Wiring harness and connector (Main relay – purge solenoid valve – PCM terminal 2AN)
      — Purge solenoid valve
      — MAF, APP1, APP2, TP and LOAD PIDs
    - If there is vacuum, inspect the following:
      — Vacuum hose (Purge solenoid valve – charcoal canister)

A/C Cut-off Control System Inspection

1. Start the engine.
2. Turn the A/C switch and the fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
    - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 s**.
    - If it actuates, inspect as follows:
      — A/C relay
      — Open or short to GND circuit in wiring harness and connectors (Ignition switch—A/C relay—PCM terminal 1AN)
      — A/C related parts
      — APP1, APP2 PIDs

Cooling Fan Control System Inspection

1. Verify that the battery voltage is **more than 12.4 V.**
    - If the battery voltage is **less than 12.4 V**, charge the battery or connect the external power supply.
2. Connect the M-MDS and access ECT PID.
3. Turn A/C switch to off.
4. Verify ECT PID is **less than 98 °C {209 °F}**.
    - If ECT PID **more than 98 °C {209 °F}**, inspect ECT sensor and related wiring harnesses.
5. Verify that the cooling fan does not operate with ECT PID is **less than 98 °C {209 °F}** while the ignition switch is ON.
    - If the cooling fan operates, inspect for following parts and related wiring harnesses:
      — ECT sensor
      — A/C switch
      — A/C refrigerant pressure switch (High/low pressure)
      — A/C refrigerant pressure switch (Medium pressure)
      — VSS
      — A/C magnetic clutch
      — Fan control signal circuit (between fan control module terminal B and PCM terminal 1W)
        - If the all items are normal, replace fan control module.
6. Verify the cooling fan operates while the A/C switch to ON with the ignition switch at ON position.
    - If the cooling fan does not operate, inspect for following:
      — A/C switch
      — A/C refrigerant pressure switch (High/low pressure)
      — Fan control module power supply circuit
      — Fan control module GND circuit
      — Fan control signal circuit (between fan control module terminal B and PCM terminal 1W)
        - If the all items are normal, replace fan control module.

7. Verify that the cooling fan operates with following table.

	PCM terminal 1R voltage	
	B+ (off)*	0V (ON)*
Cooling fan speed	Middle speed	High speed

* : A/C refrigerant pressure switch (Medium pressure) condition

- If the cooling fan operation is not specified, inspect for following:
  - — A/C refrigerant pressure switch (Medium pressure)
    - If the A/C refrigerant pressure switch (Medium pressure) is normal, replace fan control module.

8. Turn A/C switch to off.
9. Start the engine and idle it.
10. Verify that the cooling fan operating speed increases relative to ECT PID increases.
    - If the cooling fan speed does not increase inspect following:
      - — ECT sensor (characteristic)
        (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].)
      - — Fan control signal circuit (between fan control module terminal B and PCM terminal 1W)
        - If the all items are normal, replace fan control module.

Variable Valve Timing Control System Operation Inspection
When idling cannot be continued

1. Remove the oil control valve (OCV) and verify that the spool valve is at maximum retard position.
2. Connect the oil control valve (OCV).
3. Turn the ignition switch to the ON position.
4. Verify that the spool valve is at maximum retard position.
   - If the spool valve is stuck in the advance direction, inspect for the following:
     - — Short circuit in wiring harnesses or connectors between the oil control valve (OCV) and the PCM.
5. Inspect the variable valve timing actuator. (See 01-10A-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3].)

When idling can be continued

1. Disconnect oil control valve (OCV) connector.
2. Warm up the engine and idle it.
3. Apply battery voltage to the oil control valve (OCV) and verify that the engine idles roughly or stalls.
   - If the engine idles roughly or stalls, inspect the timing chain component (valve timing deviation).
   - If the engine does not idle roughly or stalls, go to the next step.
4. Remove the oil control valve (OCV) and perform spool valve operation inspection.
   (See 01-10A-35 OIL CONTROL VALVE (OCV) INSPECTION[LF, L3].)
   - If not as specified, inspect the following:
     - — Oil control valve (OCV)
     - — Harnesses and connectors between oil control valve (OCV) and PCM open or short.
   - If as specified, inspect the following hydraulic passages for clogging or leakage or both:
     - — Oil pressure switch – oil control valve (OCV)
     - — Oil control valve (OCV) – camshaft
     - — Camshaft internal passage
5. If they are normal, replace the camshaft pulley (with built-in variable valve timing actuator).

Evaporative Emission (EVAP) System Leak Inspection

- To verify that the problem has been fixed properly after repairs, the run drive cycle or EVAP system leak inspection must be performed.

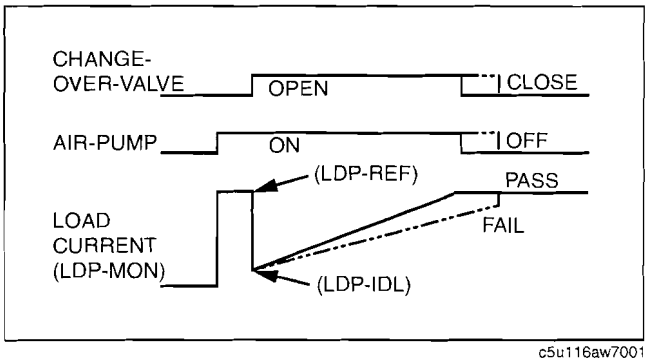
EVAP system leak inspection using M-MDS

Note
EVAP system test outline

- The EVAP system test, which can substituted for the run drive cycle as an EVAP control system repair confirmation method, can be done while operating the M-MDS in the KOEO (Key On Engine Off) condition instead of actually driving the vehicle.

EVAP system test description

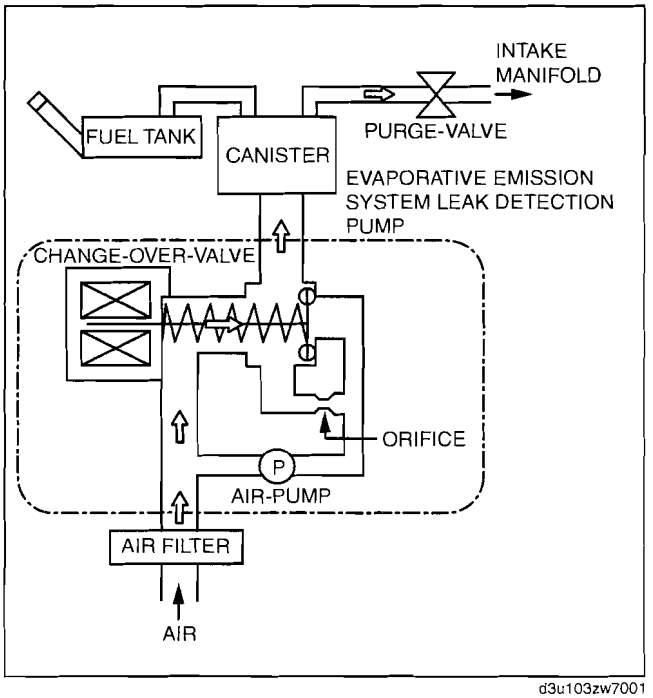
- The EVAP system test finds gas leaks in the system using the PCM to monitor changes in the air pump load current of the EVAP system leak detection pump. This test starts after sending an on-demand test signal from the M-MDS to the PCM. The PCM controls the air pump and change-over-valve operation and also stores the load current of the air pump as follows:
  i. The PCM commands turn the air pump on and retrieve the air pump load current value (LDP_MON PID) as a reference current (LDP_REF PID).
  ii. After retrieving a reference current value, the PCM commands the change-over-valve to open, then captures the air pump load current value (LDP_MON PID) as idle current (LDP_IDL PID). The EVAP system will be pressurized from this phase.
  iii. The PCM continues to monitor the air pump load current value (LDP_MON PID) until the end of the test.
- You can confirm whether any evaporative gas leak occurred or not by reading the test results.



c5u116aw7001

EVAP system malfunction judgment

- The PCM calculates the stored air pump load current value and send the results to the M-MDS as DTCs:



d3u103zw7001

DTC No.	Condition
P0442	Evaporative emission control system leak detected (small leak)
P0446	Change over valve (COV) (EVP system leak detection pump) stuck close
P0455	Evaporative emission control system leak detected (gross leak)
P0456	Evaporative emission system leak detected (very small leak)
P2401	EVAP system leak detection pump motor circuit low
P2402	EVAP system leak detection pump motor circuit high
P2404	EVAP system leak detection pump sense circuit problem
P2405	EVAP system leak detection pump sense circuit low input
P2407	EVAP system leak detection pump sense circuit intermittent

Evaporative system test procedure

1. Select the EVAP system test from the Toolbox on the M-MDS display and follow the instructions.
2. Verify that all of the following PIDs are within the specifications at the pre-test confirmation screen.

Note

- To successfully perform this procedure, all PIDs must be within the following specifications before proceeding to the next step.
- The PCM will cancel the EVAP system test if the VPWR PID value falls lower than **11.0 V** during the test.

Specification

PID	PID Range
BARO	72.2 kPa {543 mmHg, 21.3 inHg} or more
FLI	15—85%
IAT	5—45 °C {41—113 °F}
VPWR	11.0 V or more

3. Start the engine.
4. Drive the vehicle or let the engine idle more than **20 min**.
5. Turn ignition switch off, then turn it to the ON position again (Key On Engine Off).
6. Press the tick icon to start the test.
7. Verify that no DTCs present after the completion of the test.

- If any test result is indicated with red, diagnose the problem using the following DTC troubleshooting procedure or component inspection procedure.
- If any DTCs are detected, diagnose the problem using the appropriate DTC troubleshooting procedure.

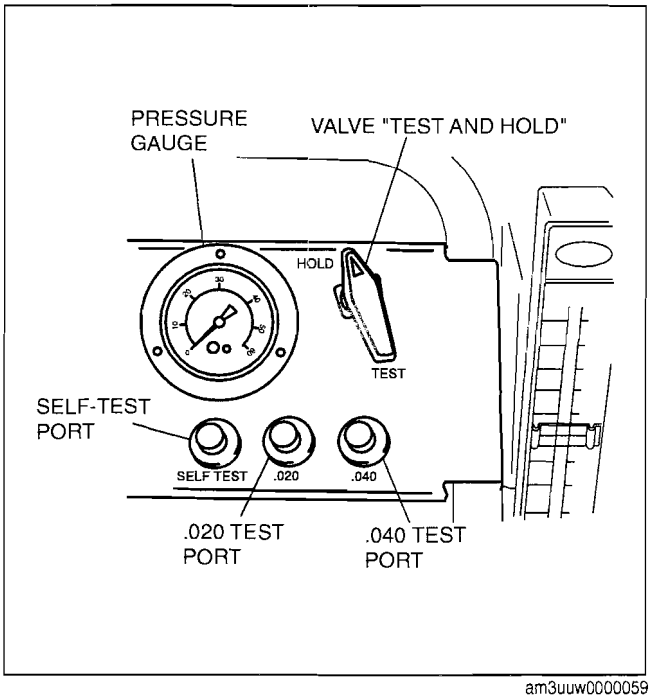
EVAP system leak inspection using leak tester

1. Perform the following **SST** (EVAP System Tester 134-01049) self-test:

Note

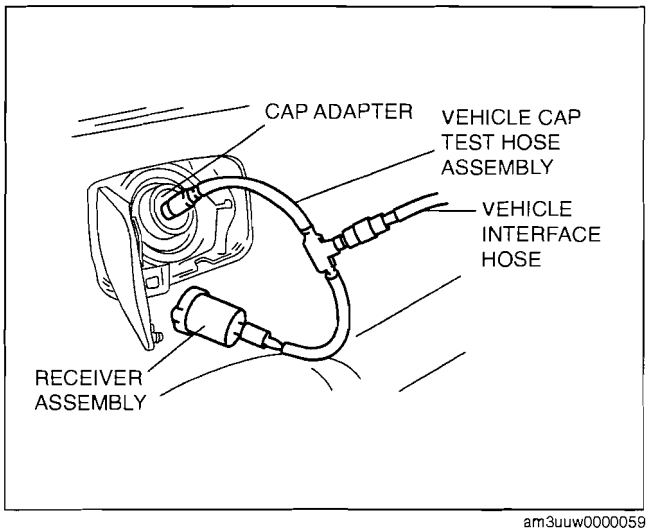
- If the tester does not work correctly during the self-test, refer to the tester operators manual for a more detailed self-test procedure.

(1) Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.
(2) Connect the vehicle interface hose (part of the **SST**) to the SELF-TEST port located on the control panel. Hand tighten the fitting. (Do not overtighten.)
(3) Turn the control valve to the TEST position.
(4) The gauge should read **331—381 mm {13—15 in}** of water.
  - If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.
(5) Turn the control valve to the HOLD position.
(6) Verify that the gauge holds pressure and that the flow meter reads no flow.
  - If there is no drop in pressure and no flow, the tester passes the self-test.
  - If the gauge leaks down, refer to the tester operators manual.



am3uuw0000059

2. Connect the **SST** to the vehicle.
   (1) Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.
   (2) Remove the fuel-filler cap from the vehicle.
      • If the fuel-filler cap is not a MAZDA part or equivalent, replace it.
   (3) Connect the receiver assembly (**SST**: AKS441130) to the vehicle cap test hose assembly (part of the **SST**) and the fuel-filler cap from the vehicle.
   (4) Connect the cap adaptor (**SST**: AKS441131) to the vehicle cap test hose assembly (part of the **SST**) and to the fuel-filler neck.
   (5) Connect the vehicle interface hose (part of the **SST**) to the center fitting of the vehicle cap test hose assembly (part of the **SST**).
3. Connect the M-MDS to the DLC-2.
4. Turn the ignition switch to the ON position (Engine off).
5. Request the PCM on-board device control (Mode 08) using the M-MDS to close the change-over valve (COV) in the EVAP system leak detection pump.



am3uuw0000059

Note
- The COV is closed for **10 min** unless the following any actions are done:
  — The engine is started.
  — The ignition switch is turned off position.

6. Make sure the control valve on the 134-01049 is in the HOLD position and that the valve on the cylinder of nitrogen gas is open.
7. Turn the control valve to the open position and let the system fill. You should note a drop in the gauge pressure along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.
8. If the gauge and the flow meter do not settle to a measurable level after **2—3 min**, then refer to the Mazda Workshop Manual to verify that the cut or vent valve is properly closed.
9. Verify the pressure gauge and flow meter reading to determine if there is an evaporative emissions leak:
   NO EVAPORATIVE LEAK:
   - The flow meter registers "zero flow" and the pressure gauge returns to the pre-set pressure of **356 mm {14 in}** of water (H2O).

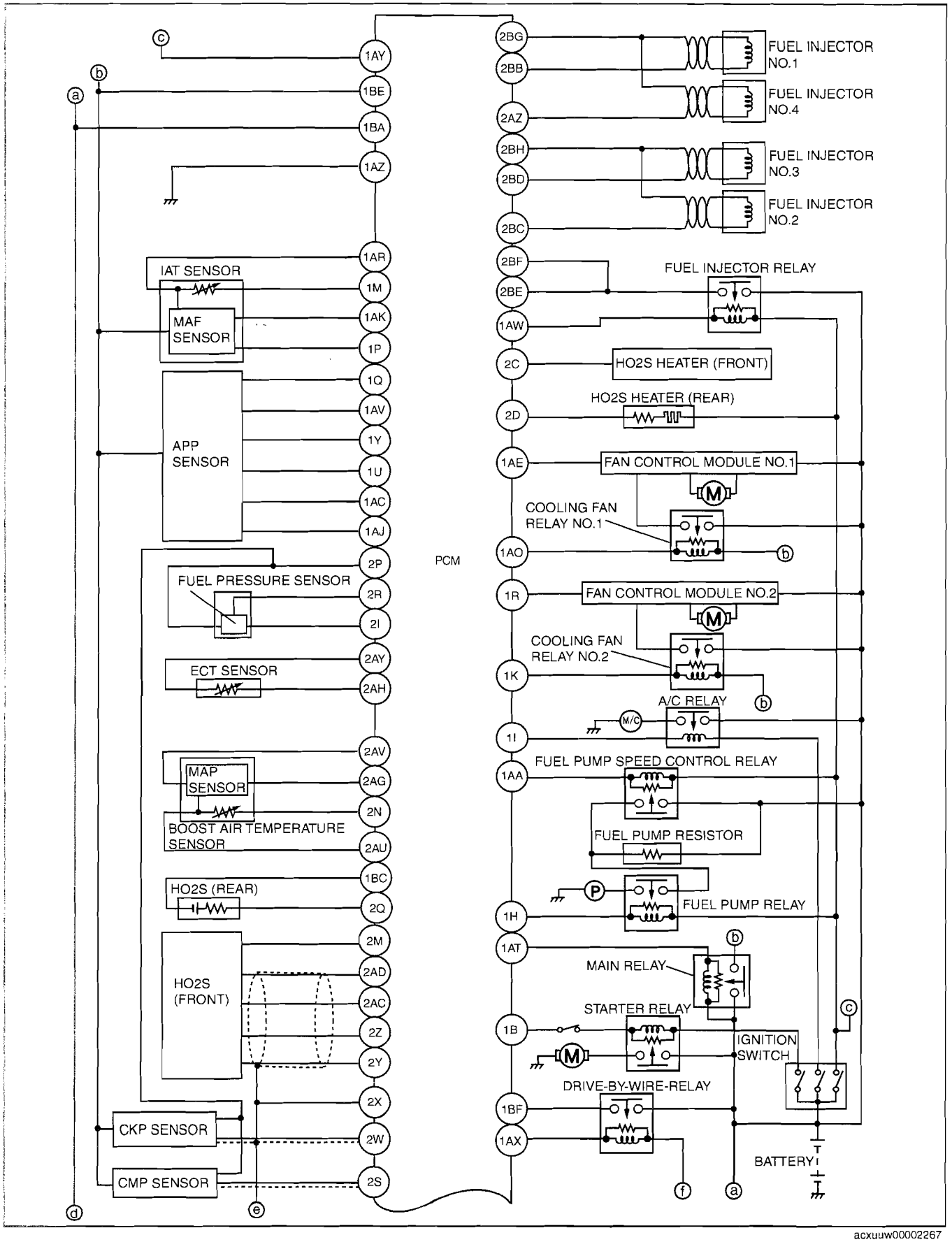
   EVAPORATIVE LEAK:
   - The pressure does not return to the preset level of **356 mm {14 in}** of water (H2O) when measuring the flow. See "SETTING LEAK STANDARD FOR TESTING" (.020 to .040 inch H2O) of the Evaporative Emissions Tester operators manual (134-01067).

Note
- Turn the control valve to the HOLD position then disconnect the **SST**.

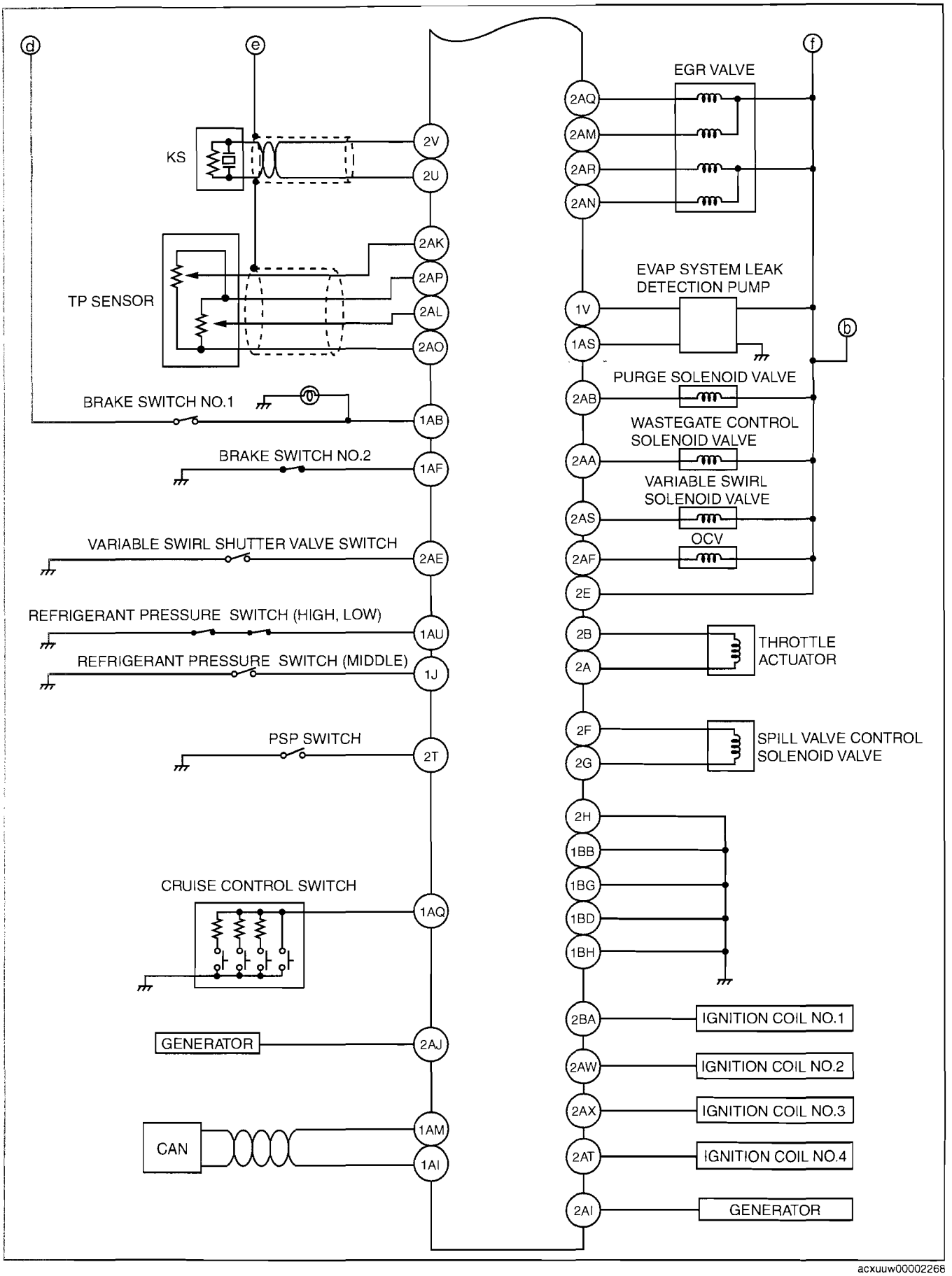
01-03B SYMPTOM TROUBLESHOOTING [L3 WITH TC]

SYMPTOM TROUBLESHOOTING WIRING DIAGRAM[L3 WITH TC]

id010339800100



acxuuw00002267

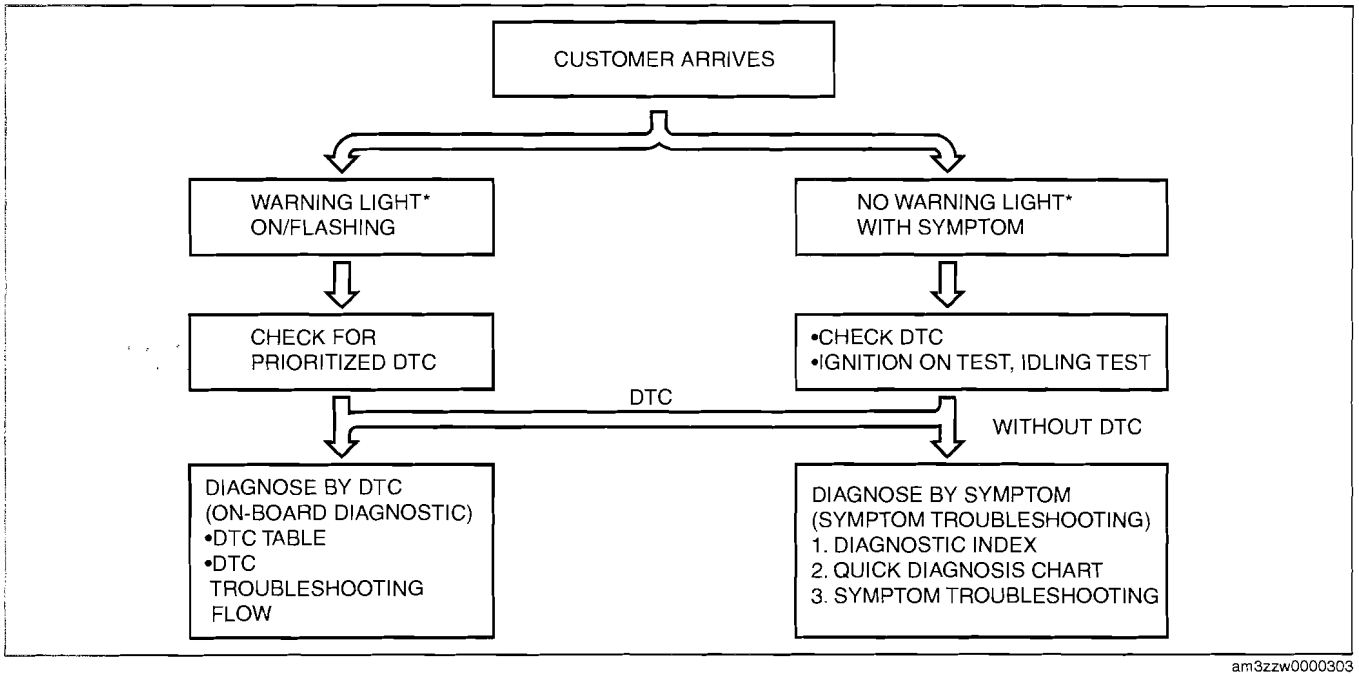


acxuuw00002268

FOREWORD[L3 WITH TC]

id010339800300

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart:
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
  - — If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See 01-03B-8 QUICK DIAGNOSTIC CHART[L3 WITH TC].)



am3zzw0000303

*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

ENGINE SYMPTOM TROUBLESHOOTING[L3 WITH TC]

id010339800500

- Verify malfunction symptoms using the following diagnostic index, then go to the appropriate troubleshooting chart.

Diagnostic Index

No.	TROUBLESHOOTING ITEM		DESCRIPTION
1	Melting of main or other fuses		—
2	MIL illuminates		MIL is illuminated.
3	Will not crank		Starter does not work.
4	Hard to start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle or after start or both.
6	Cranks normally but will not start		Starter cranks engine at normal speed but engine will not run.
7	Slow return to idle		Engine takes more time than normal to return to idle speed.
8	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned off.
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
11	Engine stalls/quits.	Acceleration/cruise	Engine stops unexpectedly at beginning of acceleration or during acceleration. Engine stops unexpectedly while cruising.
	Engine runs rough.	Acceleration/cruise	Engine speed fluctuates during acceleration or cruising.
	Misses	Acceleration/cruise	Engine misses during acceleration or cruising.
	Buck/jerk	Acceleration/cruise/ deceleration	Vehicle bucks/jerks during acceleration, cruising, or deceleration.
	Hesitation/stumble	Acceleration	Momentary pause at beginning of acceleration or during acceleration
	Surges	Acceleration/cruise	Momentary minor irregularity in engine output
12	Lack/loss of power	Acceleration/cruise	Performance is poor under load. (e.g., power down when climbing hills)
13	Knocking/pinging	Acceleration/cruise	Sound is produced when air/fuel mixture is ignited by something other than spark plug. (e.g., hot spot in combustion chamber)
14	Poor fuel economy		Fuel economy is unsatisfactory.
15	Emission compliance		Fails emissions test.
16	High oil consumption/leakage		Oil consumption is excessive.
17	Cooling system concerns	Overheating	Engine runs at higher than normal temperature/overheats.
18	Cooling system concerns	Runs cold	Engine does not reach normal operating temperature.
19	Exhaust smoke		Blue, black, or white smoke from exhaust system
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage
21	Engine noise		Engine noise from under hood
22	Vibration concerns (engine)		Vibration from under hood or driveline
23	A/C does not work sufficiently.		A/C compressor magnetic clutch does not engage when A/C is turned on.
24	A/C is always on or A/C compressor runs continuously.		A/C compressor magnetic clutch does not disengage.
25	A/C is not cut off under WOT conditions.		A/C compressor magnetic clutch does not disengage under WOT.
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust
27	Fuel refill concerns		Fuel tank does not fill smoothly.
28	Fuel filling shut off issues		Fuel does not shut off properly.
29	Spark plug condition		Incorrect spark plug condition

CONTROL SYSTEM DEVICE AND CONTROL RELATIONSHIP CHART[L3 WITH TC]

id010339800200

X: Applied

Item	ELECTRONIC THROTTLE CONTROL	IAC	VARIABLE SWIRL CONTROL	VARIABLE VALVE TIMING CONTROL	FUEL INJECTION CONTROL	FUEL PUMP CONTROL	ESA CONTROL	EGR CONTROL	EVAPORATIVE PURGE CONTROL	HO2S HEATER CONTROL	A/C CUT-OFF CONTROL	ELECTRICAL FAN CONTROL	STARTER CUT-OFF CONTROL	GENERATOR CONTROL	CRUISE CONTROL	CAN	HIGH PRESSURE FUEL PUMP CONTROL	WASTEGATE CONTROL	FUEL PUMP SPEED CONTROL
Input device																			
IAT sensor	X	X			X		X		X					X			X	X	X
MAF sensor	X	X	X	X	X		X	X	X	X		X					X	X	X
TP sensor No.1, No.2	X	X			X		X	X			X							X	X
APP sensor No.1, No.2	X	X	X	X	X		X	X	X		X	X							
MAP sensor	X	X			X				X		X								
ECT sensor	X	X	X	X	X		X	X	X	X	X	X		X					X
CMP sensor		X		X	X		X										X		
CKP sensor	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X	X
KS							X												
HO2S (front, rear)					X				X										X
BARO sensor	X	X			X				X			X						X	X
Neutral switch	X	X			X		X	X	X		X				X			X	
CPP switch	X	X			X		X	X	X		X				X			X	
Brake switch		X			X		X								X				
Instrument cluster (A/C on request signal)		X									X	X							
Refrigerant pressure switch (low pressure switch, high pressure switch)		X									X	X							
Refrigerant pressure switch (medium pressure switch)		X										X							
Battery	X			X		X	X	X	X	X				X			X	X	X
Generator (Terminal P: starter coil)		X												X					
Vehicle speed signal	X	X			X		X	X				X		X	X	X			
Cruise control switch															X				
Instrument cluster (CAN signal)	X	X			X		X			X			X			X			
Ignition switch				X	X	X	X	X		X		X							
Fuel pressure sensor	X				X	X											X		
Boost air temperature sensor		X			X		X	X									X		
Output device																			

Item	ELECTRONIC THROTTLE CONTROL	IAC	VARIABLE SWIRL CONTROL	VARIABLE VALVE TIMING CONTROL	FUEL INJECTION CONTROL	FUEL PUMP CONTROL	ESA CONTROL	EGR CONTROL	EVAPORATIVE PURGE CONTROL	HO2S HEATER CONTROL	A/C CUT-OFF CONTROL	ELECTRICAL FAN CONTROL	STARTER CUT-OFF CONTROL	GENERATOR CONTROL	CRUISE CONTROL	CAN	HIGH PRESSURE FUEL PUMP CONTROL	WASTEGATE CONTROL	FUEL PUMP SPEED CONTROL
Throttle actuator	X	X													X				
Drive-by-wire-relay	X																		
Variable swirl shutter valve actuator			X																
OCV (L3)				X															
Injector driver module					X														
Fuel pump relay						X													
Ignition coil							X												
EGR valve								X											
Purge solenoid valve									X										
HO2S heater (front, rear)										X									
A/C relay											X								
Fan control module												X							
Starter relay													X	X					
Generator (Terminal D: field coil)														X					
ABS HU/CM (With ABS) (CAN signal)																X			
Instrument cluster (CAN signal)																X			
Spill valve control solenoid valve																	X		
Wastegate control solenoid valve																		X	
Fuel pump speed control relay																			X

QUICK DIAGNOSTIC CHART[L3 WITH TC]

id010339800600

X: Applied

Troubleshooting item			Possible factor: Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open	Starter interlock switch malfunction	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper dipstick	Base engine malfunction	Flywheel is seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper	Cooling system malfunction (Radiator, hoses,overflow system, thermostat, etc.)	Cooling fan system malfunction
1	Melting of main or other fuses																
2	MIL illuminates																
3	Will not crank		X	X	X		X	X			X	X					
4	Hard start/long crank/erratic start/erratic crank		X						X		X						
5	Engine stalls	After start/at idle							X								
6	Cranks normally but will not start								X								
7	Slow return to idle															X	X
8	Engine runs rough/rolling idle								X								
9	Fast/idle runs on																
10	Low idle/stalls during deceleration								X								
11	Engine stalls/quits	Acceleration/cruise							X								
	Engine runs rough	Acceleration/cruise							X								
	Misses	Acceleration/cruise							X								
	Buck/jerk	Acceleration/cruise/ deceleration							X								
	Hesitation/stumble	Acceleration/cruise							X								
	Surges	Acceleration/cruise							X								
12	Lack/loss of power	Acceleration/cruise							X								
13	Knocking/pinging	Acceleration/cruise							X								X
14	Poor fuel economy								X					X		X	X
15	Emission compliance								X		X					X	
16	High oil consumption/leakage									X	X						
17	Cooling system concerns	Overheating											X	X	X	X	X
18	Cooling system concerns	Runs cold														X	X
19	Exhaust smoke								X		X					X	
20	Fuel odor (in engine compartment)																
21	Engine noise												X				
22	Vibration concerns (engine)																
23	A/C does not work sufficiency																
24	A/C always on or A/C compressor runs continuously.																
25	A/C does not cut off under wide open throttle																
26	Exhaust sulphur smell																
27	Fuel refill concerns																
28	Fuel filling shut off issues																
29	Spark plug condition								X								

am3zzw0000307

X: Applied

	Possible factor / Troubleshooting item		Engine or transaxle mounts are improperly installed.	Cooling fan or condenser fan seats are improper.	Fuel quality	Improper engine oil viscosity	Improper valve timing	Oil leakage (internal, turbocharger, external)	Improper oil or fluid level	Coolant leakage (internal, turbocharger, external)	Variable valve timing system malfunction	Variable tumble control system malfunction	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (loose tubes, cracks, gaskets blockage)	Air suction in intake-air system	Intake-air system restriction
1	Melting of main or other fuses																
2	MIL illuminates										X	X					
3	Will not crank																
4	Hard start/long crank/erratic start/erratic crank				X		X							X	X		X
5	Engine stalls	After start/at idle			X						X		X		X		X
6	Cranks normally but will not start				X		X						X	X	X		X
7	Slow return to idle															X	
8	Engine runs rough/rolling idle				X		X						X		X		X
9	Fast/idle runs on										X				X		
10	Low idle/stalls during deceleration						X								X		X
11	Engine stalls/quits	Acceleration/cruise			X		X					X	X	X			X
	Engine runs rough	Acceleration/cruise			X		X					X	X	X			X
	Misses	Acceleration/cruise			X		X					X	X	X			X
	Buck/jerk	Acceleration/cruise/ deceleration			X		X					X	X	X			X
	Hesitation/stumble	Acceleration/cruise			X		X					X	X	X			X
	Surges	Acceleration/cruise			X		X					X	X	X			X
12	Lack/loss of power	Acceleration/cruise			X		X				X	X	X	X	X		X
13	Knocking/pinging	Acceleration/cruise			X								X		X		
14	Poor fuel economy				X		X							X			
15	Emission compliance				X		X						X	X	X		
16	High oil consumption/leakage					X		X									
17	Cooling system concerns	Overheating								X							
18	Cooling system concerns	Runs cold															
19	Exhaust smoke							X		X				X	X		
20	Fuel odor (in engine compartment)																
21	Engine noise								X								
22	Vibration concerns (engine)		X	X													
23	A/C does not work sufficiency																
24	A/C always on or A/C compressor runs continuously.																
25	A/C does not cut off under wide open throttle																
26	Exhaust sulphur smell				X												
27	Fuel refill concerns																
28	Fuel filling shut off issues																
29	Spark plug condition													X			

am3zzw0000307

X: Applied

Troubleshooting item			Possible factor: Electronic throttle control improper operation	Throttle body malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Turbocharger malfunction	Improper operation of wastegate system	Charge air cooler malfunction	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP and pulse wheel misadjustment)	Spark plug malfunction	Fuel pump (low-pressure side) malfunction (Mechanically or electrically)	Pressure regulator (built-in fuel pump unit at fuel tank)	Inadequate fuel pressure (High-pressure side)	Inadequate fuel pressure (Low-pressure side)	Fuel line restriction or clogging
1	Melting of main or other fuses															
2	MIL illuminates		X													
3	Will not crank															
4	Hard start/long crank/erratic start/erratic crank		X		X				X	X	X	X		X	X	X
5	Engine stalls	After start/at idle	X		X				X			X		X	X	X
6	Cranks normally but will not start		X		X				X		X	X		X	X	X
7	Slow return to idle													X	X	
8	Engine runs rough/rolling idle		X		X				X		X	X		X	X	
9	Fast/idle runs on		X	X												
10	Low idle/stalls during deceleration		X		X									X	X	X
11	Engine stalls/quits	Acceleration/cruise	X	X	X	X	X				X	X		X	X	X
	Engine runs rough	Acceleration/cruise	X	X	X	X	X				X	X		X	X	X
	Misses	Acceleration/cruise	X	X	X	X	X				X	X		X	X	X
	Buck/jerk	Acceleration/cruise/ deceleration	X	X	X	X	X				X	X		X	X	X
	Hesitation/stumble	Acceleration/cruise	X	X	X	X	X				X	X		X	X	X
	Surges	Acceleration/cruise	X	X	X	X	X				X	X		X	X	X
12	Lack/loss of power	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X	X	X
13	Knocking/pinging	Acceleration/cruise	X				X	X	X					X	X	
14	Poor fuel economy				X	X		X	X		X			X	X	X
15	Emission compliance		X	X	X	X	X	X			X			X	X	
16	High oil consumption/leakage					X										
17	Cooling system concerns	Overheating														
18	Cooling system concerns	Runs cold														
19	Exhaust smoke						X		X		X			X	X	
20	Fuel odor (in engine compartment)													X	X	
21	Engine noise				X	X										
22	Vibration concerns (engine)															
23	A/C does not work sufficiency															
24	A/C always on or A/C compressor runs continuously.															
25	A/C does not cut off under wide open throttle															
26	Exhaust sulphur smell				X									X	X	
27	Fuel refill concerns															
28	Fuel filling shut off issues															
29	Spark plug condition										X	X	X	X	X	X

am3zzw0000307

X: Applied

Troubleshooting item			Possible factor: Fuel injector malfunction (inoperative)	Fuel filters restriction or clogging	Fuel pressure limiter malfunction (built-in common rail)	Spill valve control solenoid valve malfunction (built-in high pressure fuel pump)	Fuel leakage at fuel line	High pressure fuel pump malfunction	Incorrect fuel injection timing or amount	Improper air/fuel ratio mixture control	Fuel pump resister or related circuit malfunction	Exhaust system or catalytic converter restriction	Exhaust gas leakage	Catalytic converter malfunction	EGR system malfunction	EVAP control system malfunction	PCV valve malfunction
1	Melting of main or other fuses																
2	MIL illuminates		X							X				X	X	X	
3	Will not crank																
4	Hard start/long crank/erratic start/erratic crank		X	X	X	X	X	X	X	X		X			X	X	X
5	Engine stalls	After start/at idle	X		X	X	X	X	X	X	X	X			X	X	X
6	Cranks normally but will not start		X		X	X	X	X	X	X	X	X			X	X	X
7	Slow return to idle		X		X				X								
8	Engine runs rough/rolling idle		X	X	X	X	X	X				X			X	X	X
9	Fast/idle runs on		X			X											
10	Low idle/stalls during deceleration		X		X	X	X	X	X						X	X	
11	Engine stalls/quits	Acceleration/cruise	X		X	X		X	X	X	X	X			X	X	X
	Engine runs rough	Acceleration/cruise	X		X	X		X	X	X	X	X			X	X	X
	Misses	Acceleration/cruise	X		X	X		X	X	X	X	X			X	X	X
	Buck/jerk	Acceleration/cruise/ deceleration	X		X	X		X	X	X	X	X			X	X	X
	Hesitation/stumble	Acceleration/cruise	X		X	X		X	X	X	X	X			X	X	X
	Surges	Acceleration/cruise	X		X	X		X	X	X	X	X			X	X	X
12	Lack/loss of power	Acceleration/cruise			X	X		X	X		X	X	X		X	X	X
13	Knocking/pinging	Acceleration/cruise	X			X			X			X			X		
14	Poor fuel economy		X	X			X	X	X			X			X		X
15	Emission compliance		X		X	X		X	X	X		X		X	X	X	X
16	High oil consumption/leakage																X
17	Cooling system concerns	Overheating															
18	Cooling system concerns	Runs cold															
19	Exhaust smoke		X						X				X				X
20	Fuel odor (in engine compartment)		X				X									X	
21	Engine noise																
22	Vibration concerns (engine)																
23	A/C does not work sufficiency																
24	A/C always on or A/C compressor runs continuously.																
25	A/C does not cut off under wide open throttle																
26	Exhaust sulphur smell															X	
27	Fuel refill concerns															X	
28	Fuel filling shut off issues															X	
29	Spark plug condition		X				X			X		X					

am3zzw0000303

X: Applied

Troubleshooting item	Possible factor		Nonreturn valve malfunction	Fuel shut off valve malfunction	Main relay malfunction (mechanically or electrically)	No battery power supply to PCM	Poor PCM ground or vehicle ground (open)	Electrical connector disconnection	ECT sensor or related circuit malfunction	Brake switch or related circuit malfunction	Front or rear HO2S sensor or related circuit malfunction	IAT sensor 1 (integrated in MAF sensor) or related circuit malfunction	Boost air temperature sensor (integrated in MAP sensor) or related circuit malfunction	Fuel pressure sensor or related circuit malfunction	MAP sensor or related circuit malfunction
1	Melting of main or other fuses														
2	M[illegible] illuminates							X	X	X	X	X	X	X	X
3	W[illegible] not crank				X										
4	Hard start/long crank/erratic start/erratic crank								X		X			X	
5	Engine stalls	After start/at idle				X	X		X		X			X	
6	Cranks normally but will not start							X	X		X			X	
7	Slow return to idle								X					X	
8	Engine runs rough/rolling idle							X	X					X	X
9	Fast/idle runs on								X						
10	Low idle/stalls during deceleration								X	X	X			X	
11	Engine stalls/quits	Acceleration/cruise			X				X			X	X	X	X
	Engine runs rough	Acceleration/cruise			X				X			X	X	X	X
	Misses	Acceleration/cruise			X				X			X	X	X	X
	Buck/jerk	Acceleration/cruise/ deceleration			X				X			X	X	X	X
	Hesitation/stumble	Acceleration/cruise			X				X			X	X	X	X
	Surges	Acceleration/cruise			X				X			X	X	X	X
12	Lack/loss of power	Acceleration/cruise							X			X	X	X	X
13	Knocking/pinging	Acceleration/cruise										X	X	X	X
14	Poor fuel economy								X			X	X	X	X
15	Emission compliance								X		X	X	X	X	X
16	High oil consumption/leakage														
17	Cooling system concerns	Overheating													
18	Cooling system concerns	Runs cold													
19	Exhaust smoke								X		X	X	X		X
20	Fuel odor (in engine compartment)														
21	Engine noise														
22	Vibration concerns (engine)														
23	A/C does not work sufficiency														
24	A/C always on or A/C compressor runs continuously.														
25	A/C does not cut off under wide open throttle														
26	Exhaust sulphur smell							X							
27	Fuel refill concerns		X	X											
28	Fuel filling shut off issues		X	X											
29	Spark plug condition														

am3zzw0000303

X: Applied

	Troubleshooting item / Possible factor		CMP sensor damaged (e.g.open or short circuit)	CMP sensor pulse wheel (camshaft) is damaged	Improper gap between CKP sensor and pulse wheel	CKP sensor damaged (e.g.open or short circuit)	CKP sensor pulse wheel damaged	Neutral or clutch switch and related circuit malfunction	MAF sensor or related circuit malfunction	Knock sensor or related circuit malfunction	TP sensor or related circuit malfunction	Accelerator position sensor or related circuit malfunction	P/S pressure switch or related circuit malfunction	Improper vehicle speed signal	Cruise control system operation improperly	A/C system improper operation	Improper refrigerant charging amount	A/C relay (A/C control signal circuit) malfunction
1	Melting of main or other fuses																	
2	MIL illuminates		X		X			X	X	X	X	X	X	X				
3	Will not crank																	
4	Hard start/long crank/erratic start/erratic crank		X	X	X	X	X		X									
5	Engine stalls	After start/at idle	X	X	X	X	X		X			X				X	X	X
6	Cranks normally but will not start		X	X	X	X	X		X			X						
7	Slow return to idle		X	X	X	X	X	X	X			X	X					X
8	Engine runs rough/rolling idle		X	X	X	X	X	X	X			X	X			X	X	X
9	Fast/idle runs on							X				X	X		X			X
10	Low idle/stalls during deceleration		X	X	X	X	X	X	X		X	X				X		
11	Engine stalls/quits	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X		X		
	Engine runs rough	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X		X		
	Misses	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X		X		
	Buck/jerk	Acceleration/cruise/ deceleration	X	X	X	X	X	X	X		X	X		X		X		
	Hesitation/stumble	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X		X		
	Surges	Acceleration/cruise	X	X	X	X	X	X	X		X	X		X		X		
12	Lack/loss of power	Acceleration/cruise	X	X	X	X	X		X			X		X		X		X
13	Knocking/pinging	Acceleration/cruise	X	X					X	X		X						
14	Poor fuel economy		X	X	X	X	X		X			X		X		X		
15	Emission compliance		X	X	X	X	X	X	X		X	X		X				
16	High oil consumption/leakage																	
17	Cooling system concerns	Overheating														X	X	
18	Cooling system concerns	Runs cold																
19	Exhaust smoke				X			X	X		X	X		X				
20	Fuel odor (in engine compartment)																	
21	Engine noise																	
22	Vibration concerns (engine)																	
23	A/C does not work sufficiency															X	X	X
24	A/C always on or A/C compressor runs continuously.															X		X
25	A/C does not cut off under wide open throttle											X						
26	Exhaust sulphur smell																	
27	Fuel refill concerns																	
28	Fuel filling shut off issues																	
29	Spark plug condition								X									

am3zzw0000303

X: Applied

Troubleshooting item			Possible factor: A/C compressor magnetic clutch malfunction	Clutch slippage	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	Immobilizer system operating properly	Immobilizer system or related circuit malfunction	Advanced keyless entry system malfunction
1	Melting of main or other fuses											
2	MIL illuminates											
3	Will not crank									X	X	X
4	Hard start/long crank/erratic start/erratic crank											
5	Engine stalls	After start/at idle									X	
6	Cranks normally but will not start										X	
7	Slow return to idle											
8	Engine runs rough/rolling idle											
9	Fast/idle runs on											
10	Low idle/stalls during deceleration		X									
11	Engine stalls/quits	Acceleration/cruise		X								
	Engine runs rough	Acceleration/cruise		X								
	Misses	Acceleration/cruise		X								
	Buck/jerk	Acceleration/cruise/ deceleration		X								
	Hesitation/stumble	Acceleration/cruise		X								
	Surges	Acceleration/cruise		X								
12	Lack/loss of power	Acceleration/cruise		X	X							
13	Knocking/pinging	Acceleration/cruise										
14	Poor fuel economy			X	X							
15	Emission compliance											
16	High oil consumption/leakage											
17	Cooling system concerns	Overheating										
18	Cooling system concerns	Runs cold										
19	Exhaust smoke											
20	Fuel odor (in engine compartment)											
21	Engine noise					X						
22	Vibration concerns (engine)					X	X	X	X			
23	A/C does not work sufficiency		X									
24	A/C always on or A/C compressor runs continuously.		X									
25	A/C does not cut off under wide open throttle											
26	Exhaust sulphur smell											
27	Fuel refill concerns											
28	Fuel filling shut off issues											
29	Spark plug condition											

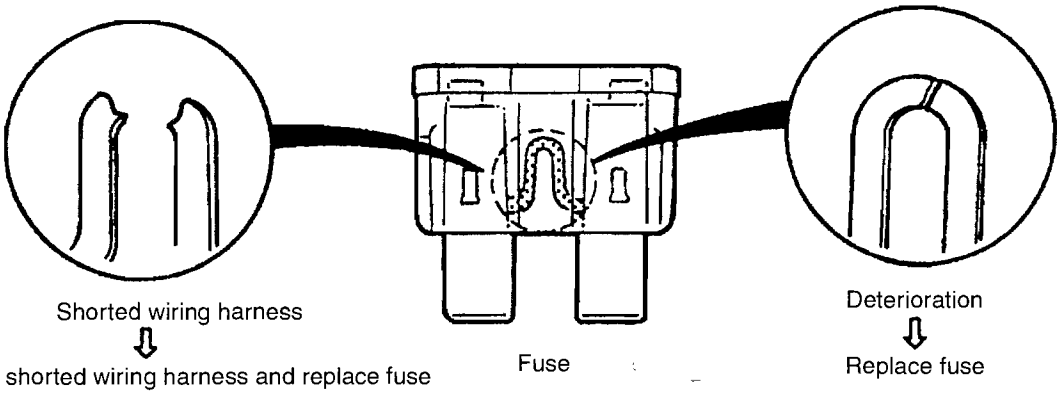
am3zzw0000304

NO.1 MELTING OF MAIN OR OTHER FUSES[L3 WITH TC]

id010339800700

1	MELTING OF MAIN OR OTHER FUSES

[TROUBLESHOOTING HINTS]
Inspect condition of fuse.



Damaged fuse	Related wiring harness
BTN	**BTN fuse** • OBD fuse (PJB) • DLC-2
IG KEY1	**IG KEY1 fuse** • Ignition switch • ENGINE fuse (PJB)
IG KEY2	**IG KEY 2 fuse** • Ignition switch • Starter relay • starter interlock switch
ENG +B	**ENG +B fuse** • PCM
ENGINE	**ENGINE fuse** • Main relay • ENG BAR 1 fuse • ENG BAR 2 fuse • ENG BAR 3 fuse • PCM
FUEL PUMP	**FUEL PUMP fuse** • Fuel pump resistor • Fuel pump speed control relay • Fuel pump relay • Fuel pump unit
INJECTOR	**INJ fuse** • Injector relay • PCM
ETC	**ETC fuse** • Drive-by-wire relay • PCM
ENG BAR 1	**ENG BAR 1 fuse** • APP sensor • PCM • Drive-by-wire relay • Oil control valve • CKP sensor • EGR valve • Wastegate control solenoid valve • Purge solenoid valve • Variable swirl solenoid valve • CMP sensor • MAF/IAT sensor • EVAP system leak detection pump
ENG BAR 2	**ENG BAR fuse** • PCM

Damaged fuse	Related wiring harness
ENG BAR 3	**ENG BAR fuse** • Front HO2S
FAN	**FAN fuse** • Fan control module
MAIN	**MAIN fuse** • Generator • Starter
STARTER	**STARTER fuse** • Starter relay • Starter
ENGINE (PJB)	**ENGINE fuse (PJB)** • Fuel pump speed control relay • Fuel pump relay • PCM • Injector relay • Ignition coil (No.1, No.2, No.3, No.4) • Condenser • Rear HO2S

NO.2 MIL ILLUMINATES[L3 WITH TC]

id010339800800

2	MIL ILLUMINATES
DESCRIPTION	MIL illuminates incorrectly.
POSSIBLE CAUSE	• PCM illuminates for emission-related concern (DTC is stored in PCM) • Instrument cluster malfunction **Note** • If the MIL blinks at a steady rate, a misfire condition could possibly exist.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** • Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** • Inspect for an open or short to circuit between instrument cluster terminal 1I and PCM terminal 1AM. • Inspect for an open or short to circuit between instrument cluster terminal 1K and PCM terminal 1AI. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
2	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

STEP	INSPECTION	RESULTS	ACTION
10	Inspect the following wiring harness and connectors. • Between coil terminal A and keyless CM terminal 3V • Between coil terminal B and keyless CM terminal 3U Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunctioning part.
		No	Go to the next step.
11	Is there continuity between the keyless CM harness-side connector terminal 2B and body ground?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
12	Turn the ignition switch to the ON position. Measure the voltage between keyless CM harness-side connector terminal 3C and body ground. Is the voltage **below 1.0V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
13	Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between keyless CM harness-side connector terminal 2A, 2C, 2E and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
14	Turn the ignition switch off. Disconnect the coil connector. Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between coil harness-side connector terminal D and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
15	Inspect the following wiring harnesses and connectors. • Between keyless CM terminal 3V and coil A • Between keyless CM terminal 3U and coil B • Between keyless CM terminal 3X and PCM 1AM • Between keyless CM terminal 3W and PCM 1AI Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunctioning part.
		No	Go to the next step.
16	Is there continuity between PCM terminal 1B and the starter relay with the clutch pedal depressed?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
17	Inspect the following: • Battery connection • Battery condition • Fuses Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
18	Is a clicking sound heard from the starter when the ignition switch is turned to the START position?	Yes	Go to the next step.
		No	Go to Step 24.
19	Inspect the starting system. (See 01-19B-3 STARTER INSPECTION[L3 WITH TC].) Is the starting system normal?	Yes	Inspect for a seized/hydro-locked engine, flywheel. (See 05-10-16 DUAL-MASS FLYWHEEL INSPECTION[L3 WITH TC].)
		No	Repair or replace components if necessary required.
20	Do any other electrical accessories work?	Yes	Go to the next step.
		No	Inspect the charging system. (See 01-17B-4 BATTERY INSPECTION[L3 WITH TC].) (See 01-17B-7 GENERATOR INSPECTION[L3 WITH TC].)

STEP	INSPECTION	RESULTS	ACTION
21	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Inspect the following: • START circuit in the ignition switch • Open circuit between ignition switch and starter • Starter interlock switch
22	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK[L3 WITH TC]

id010339801000

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
DESCRIPTION	• Starter cranks the engine at normal speed but the engine requires excessive cranking time before starting. • Battery is operating normally
POSSIBLE CAUSE	• Vacuum leakage • Poor fuel quality • Starting system malfunction • Erratic signal to ignition coils • Spark plug malfunction • Air leakage from intake-air system • Improper air/fuel mixture ratio control • Incorrect fuel injection timing • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Front and/rear HO2S sensor or related circuit malfunction • ECT sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Intake-air system restriction • Improper operation of electronic throttle control system • PCV valve malfunction • Inadequate fuel pressure (high or low pressure side) • Relief valve malfunction (built-in delivery pipe) • Spill valve control solenoid valve malfunction (built-in high pressure fuel pump) • Fuel filter clogging • Fuel line restriction • Fuel leakage • Fuel pump (low-side) resister or related circuit malfunction • Fuel injector malfunction • Fuel pressure sensor malfunction • High pressure fuel pump malfunction • Exhaust system or three-way catalytic converter restriction • EGR valve malfunction • Purge solenoid valve malfunction • Low engine compression • Improper valve timing **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Fuel leakage • Intake-air system leakage or restriction • Vacuum leakage Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
3	Access the ECT PID using the M-MDS. Verify that the ECT PID is **less than 116°C {241°F}** during driving. Is the ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could be from the cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
4	Will the engine run smoothly at part throttle?	Yes	Go to the next step.
		No	Go to Step 6.
5	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damage/scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
6	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the Purge Control System Operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Inspect the CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses. Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
9	Access and monitor following the PIDs using the data monitor function. • ECT • MAF • O2S11 • O2S12 • LONGFT1 • SHTFT1 Do the PIDs indicate the correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
10	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
11	Inspect for restriction in the exhaust system and the three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace the malfunctioning part.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
12	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
13	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 38.
		No	Go to the next step.
14	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 16.
15	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 17.
		No	Replace the delivery pipe.
16	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 21.
		No	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)
17	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.
18	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are the fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
19	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Does the starting system work properly?	Yes	Go to the next step.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
20	Inspect the starting system. (See 01-19B-3 STARTER INSPECTION[L3 WITH TC].) Does the starting system work properly?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Repair or replace the malfunctioning part.
21	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.5 ENGINE STALLS-AFTER START/AT IDLE[L3 WITH TC]

id010339801100

5	ENGINE STALLS-AFTER START/AT IDLE
DESCRIPTION	• Engine stops unexpectedly.
POSSIBLE CAUSE	• A/C system improper operation • Air leakage from intake-air system • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Vacuum leakage • Engine overheating • Low engine compression • Ignition system malfunction • Poor fuel quality • PCV valve malfunction • Intake-air system restriction • Exhaust system and/or three-way catalytic converter (TWC) restriction or clogging • Electrical connector disconnection • Open or short circuit in the fuel pump (low-side) body or related wiring harness • Fuel pump resister or related circuit malfunction • No battery power supply to PCM or poor ground • Inadequate fuel pressure (high or low pressure side) • Fuel pressure sensor or related circuit malfunction • Spill valve control solenoid valve malfunction (built-in high pressure fuel pump) • Relief valve malfunction (built-in delivery pipe) • Fuel pump (low-side) body mechanical malfunction • Fuel leakage • Fuel line restriction • Fuel filter clogging • Incorrect fuel injection timing • High pressure fuel pump malfunction • Fuel injector malfunction • Ignition coil malfunction • Improper air/fuel mixture ratio control • No signal from CKP sensor due to sensor, related wiring harness or wrong installation • Erratic signal from CMP sensor • Front and/or rear HO2S sensor or related circuit malfunction • ECT sensor or related circuit malfunction • Accelerator positions sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Improper valve timing • Improper operation variable valve timing control system • Immobilizer system and/or circuit malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Do any of the following conditions appear? • Engine does not start completely. • DTC B1681 is displayed.	Yes	**Both conditions are appear:** Go to Step 5.
		No	**Either or other condition appears:** Go to the next step.
2	Does the engine stall after **approx. 2s** from when it is started?	Yes	Go to the next step.
		No	Is the immobilizer system is normal? Go to Step 16.
3	Is the coil connector securely connected to coil?	Yes	Go to the next step.
		No	Connect the connector securely, retest from Step 2.
4	Does the security light illuminate?	Yes	Go to the next step.
		No	Inspect and repair or replace the following: • Wiring harnesses and connectors from PCM terminal 1Al and instrument cluster terminal 1K • Wiring harnesses and connectors from PCM terminal 1AM and instrument cluster terminal 1I (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
5	Retrieve the DTC using the M-MDS. Are any of the following DTCs present? **DTC B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test. (See 09-02A-4 DTC TABLE[IMMOBILIZER SYSTEM])
		No	Advanced keyless entry system is not equipped: Go to the next step. Advanced keyless entry system is equipped: Go to Step 11.
6	Is there continuity between PCM terminal 1BB, 1BH, 1BD, 1BG, 1AZ and ground?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
7	Turn the ignition switch to the ON position (Engine off.) Measure the voltage between PCM terminal1BB, 1BH, 1BD, 1BG, 1AZ and ground. Is the voltage **below 1.0V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
8	Turn the ignition switch to the ON position. (Engine off) Access the VPWR PID. Is the VPWR PID normal? **VPWR PID** **Battery voltage**	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
9	Disconnect the coil connector. Turn the ignition switch to the ON position. (Engine off) Is there battery voltage at coil connector terminal D?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between coil connector terminal D and the fuse panel.
10	Inspect the following wiring harness and connectors. • Between coil terminal A and keyless CM terminal 3V • Between coil terminal B and keyless CM terminal 3U Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunction part.
		No	Go to the next step.
11	Is there continuity between the keyless CM harness-side connector terminal 2B and body ground?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
12	Turn the ignition switch to the ON position. Measure the voltage between keyless CM harness-side connector terminal 2B and body ground. Is the voltage **below 1.0V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
13	Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between keyless CM harness-side connector terminal 2A, 2C, 2E and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.

STEP	INSPECTION	RESULTS	ACTION
14	Turn the ignition switch off. Disconnect the coil connector. Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between coil harness-side connector terminal D and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
15	Inspect the following wiring harnesses and connectors. • Between keyless CM terminal 3V and coil A • Between keyless CM terminal 3U and coil B • Between keyless CM terminal 3X and PCM 1AM • Between keyless CM terminal 3W and PCM 1AI Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunctioning part.
		No	Go to the next step.
16	Inspect for the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Intake-air system leakage and restriction • Electrical connectors • Poor connection for PCM ground and body ground • Fuel leakage • Vacuum leakage Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 16.
17	Perform the self-test function using M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is the DTC displayed?	Yes	DTC is displayed: Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	No DTC is displayed: Go to the next step.
18	Access the ECT PID using the M-MDS. Verify that the ECT PID is **less than 116 °C {241 °F}** during driving. Is the ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could from be cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
19	Access the VPWR PID. Turn the ignition switch to the ON position. (Engine off) Does the VPWR PID indicate **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between main relay terminal C and PCM terminal 2Y and 1D.
20	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning parts according to the inspection results.
21	Will the engine run smoothly at part throttle?	Yes	Go to the next step.
		No	Go to Step 23.
22	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
23	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
24	Perform the Purge Control System Operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.

STEP	INSPECTION	RESULTS	ACTION
25	Perform the Variable Valve Timing Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable valve timing control system work properly?	Yes	Inspect the valve timing.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
26	Inspect the CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according inspection results.
		No	Go to the next step.
27	Access and monitor the following PIDs using the data monitor function. • ECT • APP • MAF • O2S11 • O2S12 • LONGFT1 • SHTFT1 Do the PIDs indicate the correct values under the malfunction condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
28	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
29	Inspect for restriction in the exhaust system and Three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace malfunctioning part.
		No	Go to the next step.
30	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
31	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 35.
		No	Go to the next step.
32	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 34.
33	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 35.
		No	Replace the delivery pipe.
34	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 38.
		No	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)
35	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal, replace the fuel pump.

STEP	INSPECTION	RESULTS	ACTION
36	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are the fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
37	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are the compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
38	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.6 CRANKS NORMALLY BUT WILL NOT START[L3 WITH TC]

id010339801200

6	CRANKS NORMALLY BUT NOT START
DESCRIPTION	• Starter cranks engine at normal speed but engine will not run. • Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after the engine stalls. • Fuel is in tank. • Battery is in normal condition.
POSSIBLE CAUSE	• Air leakage from intake-air system • Open PCM ground or vehicle body ground • Improper operation of electronic throttle control system • EGR valve malfunction • Low engine compression • Engine overheating • Vacuum leakage • Ignition system malfunction • Poor fuel quality • PCV valve malfunction • Intake-air system restriction • Improper air/fuel mixture ratio control • No signal from CKP sensor due to sensor, related wire or incorrect installation • No signal from CMP sensor due to sensor, related wire or incorrect installation • Front and/or rear HO2S sensor or related circuit malfunction • ECT sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • MAF sensor or related circuit malfunction • High pressure fuel pump malfunction • Exhaust system or three-way catalytic converter (TWC) malfunction • Disconnected electrical connector • Open or short in fuel pump (low-side) body and related harness • Inadequate fuel pressure (high or low pressure side) • Fuel pressure sensor or related circuit malfunction • Relief valve malfunction (built-in high pressure fuel pump) • Fuel line clogging or restriction • Incorrect fuel injection timing • Fuel pump resistor or control relay malfunction • Fuel pump (low-side) mechanical malfunction • Fuel leakage • Fuel injector malfunction • Purge solenoid valve malfunction • Spark plug malfunction • Ignition coil malfunction • Improper valve timing • Improper variable valve timing control system operation • Immobilizer system or related circuit malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Do any of the following conditions appear? • Engine does not completely start. • DTC B1681 is displayed.	Yes	**Both conditions are appear:** Go to Step 5.
		No	**Either or other condition appears:** Go to the next step.
2	Does the engine stall after **approx. 2s** from when it is started?	Yes	Go to the next step.
		No	Is the Is the immobilizer system is normal. Go to Step 20.
3	Is the coil connector securely connected to coil?	Yes	Go to the next step.
		No	Connect the connector securely, retest from Step 1.
4	Does the security light illuminate?	Yes	Go to the next step.
		No	Inspect and repair or replace the following: • Wiring harnesses and connectors from PCM terminal 1AI and instrument cluster terminal 1K • Wiring harnesses and connectors from PCM terminal 1AM and instrument cluster terminal 1I (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
5	Retrieve the DTC using the M-MDS. Are any of the following DTCs present? **DTC** **B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431**	Yes	Go to appropriate DTC test. (See 09-02A-4 DTC TABLE[IMMOBILIZER SYSTEM].)
		No	Advanced keyless entry system is not equipped: Go to the next step. Advanced keyless entry system is equipped: Go to Step 11.
6	Is there continuity between PCM terminal 1BB, 1BH, 1BD, 1BG, 1AZ and ground?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
7	Turn the ignition switch to the ON position (Engine off.) Measure the voltage between PCM terminal 1BB, 1BH, 1BD, 1BG, 1AZ and ground. Is the voltage **below 1.0V?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
8	Turn the ignition switch to the ON position. (Engine off) Access the VPWR PID. Is the VPWR PID normal? **VPWR PID** **Battery voltage**	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
9	Disconnect the coil connector. Turn the ignition switch to the ON position. (Engine off) Is there battery voltage at coil connector terminal D?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between coil connector terminal D and the fuse panel.
10	Inspect the following wiring harness and connectors. • Between coil terminal A and keyless CM terminal 3V • Between coil terminal B and keyless CM terminal 3U Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunctioning part.
		No	Go to the next step.
11	Is there continuity between the keyless CM harness-side connector terminal 3C and body ground?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
12	Turn the ignition switch to the ON position. Measure the voltage between keyless CM harness-side connector terminal 2B and body ground. Is the voltage **below 1.0V?**	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
13	Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between keyless CM harness-side connector terminal 2A, 2C, 2E and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.

STEP	INSPECTION	RESULTS	ACTION
14	Turn the ignition switch off. Disconnect the coil connector. Turn the ignition switch to the ON position. (Engine off.) Measure the voltage between coil harness-side connector terminal D and body ground. Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
15	Inspect the following wiring harnesses and connectors. • Between keyless CM terminal 3V and coil A • Between keyless CM terminal 3U and coil B • Between keyless CM terminal 3X and PCM 1AM • Between keyless CM terminal 3W and PCM 1AI Is there any malfunction (open or short circuit, terminal corrosion, etc.)?	Yes	Repair or replace malfunctioning part.
		No	Go to the next step.
16	Inspect for the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Intake-air system leakage and restriction • Electrical connectors • Fuses • Fuel leakage • Vacuum leakage • Poor connection for PCM ground and body ground Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 16.
17	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	DTC is displayed: Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	No DTC is displayed: Go to the next step.
18	Access the ECT PID using the M-MDS. Verify that the ECT PID is **less than 116°C {241°F}** during driving. Is the ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could be from the cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
19	Does the engine start with throttle close?	Yes	Go to the next step.
		No	Go to Step 25.
20	Perform the Variable Valve Timing Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable valve timing control system work properly?	Yes	Inspect the valve timing.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
21	Will the engine start and run smoothly at part throttle?	Yes	Go to the next step.
		No	Go to Step 23.
22	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according the to inspection results.
23	Access the RPM PID using the M-MDS. Is the RPM PID indicating engine speed when the cranking engine.	Yes	Go to the next step.
		No	Inspect the CKP sensor for following; • Installation condition (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in wiring harnesses Is there any malfunction detected?

STEP	INSPECTION	RESULTS	ACTION
24	Inspect CMP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according inspection results.
		No	Go to the next step.
25	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
26	Perform the Purge Control System Operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
27	Access and monitor the following PIDs using the data monitor function. • ECT • APP • MAF • O2S11 • O2S12 • LONGFT1 • SHTFT1 Do the PIDs indicate the correct values under the malfunction condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
28	Inspect for restriction in the exhaust system and three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace malfunctioning part.
		No	Go to the next step.
29	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
30	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
31	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 38.
		No	Go to the next step.
32	Replace the high pressure fuel pump. MOnitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 37.
		No	Go to the next step.
33	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the delivery pipe.
34	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal, replace the fuel pump.
35	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are the fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)

STEP	INSPECTION	RESULTS	ACTION
36	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are the compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
37	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.7 SLOW RETURN TO IDLE[L3 WITH TC]

id010339801300

7	SLOW RETURN TO IDLE
DESCRIPTION	• Engine takes more time than normal to return to idle speed. • Engine speed continues at fast idle after warm-up
POSSIBLE CAUSE	• ECT sensor or related circuit malfunction • Thermostat is stuck open • Fuel injection timing is incorrect • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Accelerator position sensor or related circuit malfunction • Air suction in intake-air system • MAF sensor or related circuit malfunction • Fuel pressure sensor or related circuit malfunction • Excessive fuel pressure • Relief valve malfunction (built-in delivery pipe) • Fuel injector malfunction • Cooling fan control system malfunction • Improper load signal input **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect air suction in intake-air system components while racing engine to higher speed. Is any air suction?	Yes	Repair or replace as necessary.
		No	Go to the next step.
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
3	Access the ECT PID. Start and warm-up engine to normal operating temperature. Is the ECT PID reading **below 82°C {180°F}?**	Yes	Go to the next step.
		No	Go to symptom troubleshooting "NO.18 COOLING SYSTEM CONCERNS, RUNS COLD". (See 01-03B-62 NO.18 COOLING SYSTEM CONCERNS-RUNS COLD[L3 WITH TC].)
4	Verify the cooling fan operation. Does the cooling fan operate properly according ECT PID value?	Yes	Go to the next step.
		No	Perform the Cooling Fan Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].)
5	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses. Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according inspection results.
		No	Go to the next step.
6	Access and monitor following the PIDs using the data monitor function. • ECT • APP • MAF • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) • PSP (PCM terminal 2T) Do the PIDs indicate the correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
7	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 11.
		No	Go to the next step.
8	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 10.
9	Inspect the fuel pressure sensor. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 11.
		No	Replace the delivery pipe.
10	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 13.
		No	Go to the next step.
11	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)

STEP	INSPECTION	RESULTS	ACTION
12	Remove the thermostat and inspection operation. (See 01-12B-10 THERMOSTAT REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-12B-11 THERMOSTAT INSPECTION[L3 WITH TC].) Is the thermostat normal?	Yes	Inspect and repair or replace the throttle body. If throttle body is normal or the problem remains, replace the injector driver module.
		No	Replace thermostat.
13	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.8 ENGINE RUNS ROUGH/ROLLING IDLE[L3 WITH TC]

id010339801400

8	ENGINE RUNS ROUGH/ROLLING IDLE
DESCRIPTION	• Engine speed fluctuates between the specified idle speed and lower speed and, engine shakes excessively. • Idle speed is too slow and the engine shakes excessively.

8	ENGINE RUNS ROUGH/ROLLING IDLE
POSSIBLE CAUSE	• Air leakage from intake-air system • A/C system improper operation • Erratic signal to ignition coil • Spark plug malfunction • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR valve malfunction • Low engine compression or excessive unbalance for each cylinder • Improper valve timing • Improper variable valve timing control system • Poor fuel quality • PCV valve malfunction • Intake-air system restriction • Exhaust system or three-way catalytic converter (TWC) restriction or clogging • Disconnected electrical connectors • Inadequate fuel pressure (high or low pressure side) • Fuel pressure sensor or related circuit malfunction • Spill valve control solenoid valve malfunction (built-in high pressure fuel pump) • Relief valve malfunction (built-in delivery pipe) • Fuel pump (low-side) body mechanical malfunction • Fuel filter restriction or clogging • Fuel leakage • Incorrect fuel injection timing • Unbalanced fuel injection amount for each cylinder • High pressure fuel pump malfunction • Fuel injector malfunction • Erratic signal from CKP sensor • Erratic or no signal from CMP sensor • ECT sensor or related circuit malfunction • Manifold absolute pressure (MAP) sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • MAF sensor malfunction • Incorrect or no load signal input • Engine overheating • Vacuum leakage **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Intake-air system restriction or leakage • Electrical connectors connection • Fuel leakage in fuel system • Vacuum leakage Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.

STEP	INSPECTION	RESULTS	ACTION
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
3	Access the ECT PID. Verify that the ECT PID is **less than 116°C {241°F}** during driving. Is the ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could be from the cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
4	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts according to inspection results.
5	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
6	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according the to inspection results.
7	Perform the Purge Control System Operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Perform the Variable Valve Timing Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
9	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses. Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
10	Connect the M-MDS to the DLC-2. Access and monitor following PIDs using the data monitor function. • ACSW • APP • ECT • MAF • MAP • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) • PSP (PCM terminal 2T) Do the PIDs indicate the correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
11	Inspect for restriction in the exhaust system and three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace the malfunctioning part.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
12	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
13	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
14	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 18.
		No	Go to the next step.
15	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 17.
16	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 18.
		No	Replace the delivery pipe.
17	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 21.
		No	Go to the next step.
18	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-40B-7 PCM INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.
19	Inspect fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are the fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
20	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
21	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.9 FAST IDLE/RUNS ON[L3 WITH TC]

id010339801500

9	FAST IDLE/RUNS ON
DESCRIPTION	• Engine speed continues at fast idle after warm-up. • Engine runs after the ignition switch is turned off.
POSSIBLE CAUSE	• ECT sensor or related circuit malfunction • Suction control valve (built-in high pressure fuel pump) • Fuel injector malfunction • Air leakage from intake-air system • Throttle body malfunction • Accelerator pedal position sensor or related circuit malfunction • Cruise control system operation improperly • Improper load signal input • Improper operation of electric throttle control system **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC. Access the ECT PID. Start and warm-up engine to normal operating temperature. Is ECT PID reading between **82—112 °C {180—234 °F}?**	Yes	Go to the next step.
		No	**ECT PID is higher than 112 °C {234 °F}:** Go to symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING". **ECT PID is less than 82 °C {180 °F}** Go to symptom troubleshooting "NO.18 COOLING SYSTEM CONCERNS - RUNS COLD".
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
3	Inspect for leakage in intake-air system. Is there any leakage found?	Yes	Repair or replace for leakage.
		No	Go to the next step.
4	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
5	Connect the M-MDS to the DLC-2. Access and monitor the following PIDs using the data monitor function. • ECT • APP • ACSW • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) • PSP (PCM terminal 2T) Do the PIDs indicate the correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
6	Inspect the high pressure fuel pump. (See 01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) Is the high pressure fuel pump normal?	Yes	Go to the next step.
		No	Replace the high pressure fuel pump.
7	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
8	Inspect the operation of cruise control system. Does the cruise control system work properly?	Yes	Inspect and repair or replace the injector driver module or related circuit.
		No	Repair or replace the malfunctioning part according to inspection results.
9	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.10 LOW IDLE/STALLS DURING DECELERATION[L3 WITH TC]

id010339801600

10	LOW IDLE/STALLS DURING DECELERATION
DESCRIPTION	• Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	• Poor fuel quality • Vacuum leakage • Improper operation of electronic throttle control system • Air leakage from intake-air system • Intake-air system restriction • EVAP control system malfunction • Improper air/fuel mixture ratio control • Erratic signal from CKP sensor • Erratic signal from CMP sensor • Accelerator position sensor or related circuit malfunction • TP sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Front and/or rear HO2S sensor or related circuit malfunction • Brake switch or related circuit malfunction • Neutral or clutch switch malfunction or related circuit malfunction • Improper A/C magnetic clutch operation • Inadequate fuel pressure (high or low pressure side) • Suction control valve malfunction (built-in high pressure fuel pump) • Relief valve malfunction (built-in delivery pipe) • Fuel leakage • Fuel line restriction • Fuel filter clogging • Incorrect fuel injection timing • High pressure fuel pump malfunction • Fuel injector malfunction • Low engine compression • Improper valve timing • EGR system malfunction • Vacuum leakage • ECT sensor or related circuit malfunction • Fuel pressure sensor or related circuit malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does the engine idle rough?	Yes	Go to symptom troubleshooting "NO.8 ENGINE RUNS ROUGH/ROLLING IDLE". (See 01-03B-34 NO.8 ENGINE RUNS ROUGH/ ROLLING IDLE[L3 WITH TC].)
		No	Go to the next step.
2	Verify the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Intake-air system restriction or leakage • Fuel leakage in fuel system • Vacuum leakage Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.

STEP	INSPECTION	RESULTS	ACTION
3	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according inspection results.
		No	Go to the next step.
4	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
5	Connect the M-MDS to the DLC-2. Access and monitor the following PIDs using the data monitor function. • ACSW • APP • BOO • ECT • MAF • TP • O2S11 • O2S12 • LONGFT1 • SHTFT1 • PSP (PCM terminal 1D) • CPP (PCM terminal 1S) • PNP (PCM terminal 2T) Do the PIDs indicate the correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
6	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Perform the Purge Control System Operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
9	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts according to inspection results.
10	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 14.
		No	Go to the next step.
11	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 14.
12	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 14.
		No	Replace the delivery pipe.

STEP	INSPECTION	RESULTS	ACTION
13	Replace the high pressure fuel pump Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to the Step 17.
		No	Go to the next step.
14	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.
15	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
16	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
17	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES[L3 WITH TC]

id010339801700

11	**ENGINE STALLS/QUITS-ACCELERATION/CRUISE** **ENGINE RUNS ROUGH-ACCELERATION/CRUISE** **BUCK/JERK-ACCELERATION/CRUISE/DECELERATION** **HESITATION/STUMBLE-ACCELERATION** **SURGES-ACCELERATION/CRUISE**
DESCRIPTION	• Engine stops unexpectedly at beginning of acceleration or during cruise. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, during or deceleration. • Momentary pause at beginning of acceleration or during acceleration • Momentary minor irregularity in engine output

11	ENGINE STALLS/QUITS-ACCELERATION/CRUISE ENGINE RUNS ROUGH-ACCELERATION/CRUISE BUCK/JERK-ACCELERATION/CRUISE/DECELERATION HESITATION/STUMBLE-ACCELERATION SURGES-ACCELERATION/CRUISE
POSSIBLE CAUSE	• A/C system improper operation • Air leakage from intake-air system • Intake-air system restriction • Purge solenoid valve malfunction • Improper operation of electronic throttle control system • EGR system malfunction • Low engine compression • Turbocharger malfunction • Improper operation of wastegate control system • Vacuum leakage • Poor fuel quality • Main relay intermittent malfunction • Throttle body malfunction • Engine overheating • Spark plug malfunction • Variable swirl system malfunction • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out timing chain • Exhaust system and/or three-way catalytic converter restriction • Intermittent open or short circuit in fuel pump circuit • Incorrect fuel injection timing • Inadequate fuel pressure (high or low pressure side) • Fuel pressure sensor or related circuit malfunction • Suction control valve malfunction (built-in high pressure fuel pump) • Relief valve malfunction (built-in delivery pipe) • High pressure fuel pump malfunction • Fuel injector malfunction • Improper fuel pump speed control operation • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Improper air/fuel mixture ratio control operation • Erratic or no signal from CMP sensor • Erratic signal from CKP sensor • Front and/or rear HO2S sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Neutral switch or related circuit malfunction • ECT sensor or related circuit malfunction • Manifold absolute pressure (MAP) sensor or related circuit malfunction • IAT sensor No.1 or related circuit malfunction • IAT sensor No.2 or related circuit malfunction • Intermittent open or short circuit MAF sensor, accelerator position sensor, TP sensor and VSS • Clutch slippage **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** Caution • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Air leakage from intake-air system • Intake-air system restriction • Air cleaner element • Clutch slippage • Fuel leakage from fuel line • Vacuum leakage Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
3	Access the ECT PID. Verify that the ECT PID is **less than 116°C {241°F}** during driving. Is the ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could be from the cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
4	Perform the Main Relay Operation Inspection with wiggle the related harness. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the main relay operate properly?	Yes	Go to the next step.
		No	Repair or replace for the intermittent fault.
5	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
6	Connect the M-MDS to DLC-2. Access and monitor following PIDs using the data monitor function while wiggle the harness and under trouble condition. • APP • ECT • MAF • IAT • IAT2 • MAP • FP • VSS • O2S11 • O2S12 • LONGFT1 • SHTFT1 • CPP (PCM terminal 1S) • PNP (PCM terminal 2T) Do the PIDs indicate correct values? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the Step 13.
		No	Inspect and repair or replace suspected parts and related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].) If the MAP PID remains without specified, go to the next step.
7	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.

STEP	INSPECTION	RESULTS	ACTION
8	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning parts, according to inspection results.
9	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
10	Perform the Variable Swirl Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable swirl system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
11	Perform the Purge Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
12	Perform the Fuel Pump Speed Control Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the fuel pump speed control work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
13	Perform the Wastegate Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the wastegate control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
14	Remove the parts necessary to inspect turbocharger without remove the turbocharger. Inspect if turbocharger compressor wheel is bent, damaged, or interfering with housing on vehicle. (See 01-13B-18 TURBOCHARGER INSPECTION[L3 WITH TC].) Is there any problem?	Yes	Replace the turbocharger.
		No	Go to the next step.
15	Inspect the turbocharger compressor wheel locknut is loose or has fallen down inside turbocharger. Is there any problem?	Yes	Replace the turbocharger.
		No	Go to the next step.
16	Inspect if turbocharger compressor wheel by hand. Does the wheel turn easily and smoothly?	Yes	Go to the next step.
		No	Replace the turbocharger.
17	Inspect the turbocharger turbine wheel is damaged, cracked or interfering with housing on vehicle. **Note** • Inspect all fins on each turbine wheel. Is there any problem?	Yes	Replace the turbocharger.
		No	Go to the next step.
18	Is any engine oil found inside turbocharger turbine housing?	Yes	**Excessive amount of oil is found:** Replace the turbocharger. **Small amount of oil is found:** Wipe oil out of vehicle, then go to the next step.
		No	Go to the next step.
19	Is any engine oil found inside turbocharger compressor housing?	Yes	Wipe oil out vehicle and install all removed parts in Step 14. Then, go to the next step.
		No	Turbocharger is normal. Install all parts removed in Step 14. Then, go to the next step.

STEP	INSPECTION	RESULTS	ACTION
20	Inspect for restriction in the exhaust system and three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
21	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
22	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
23	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 27.
		No	Go to the next step.
24	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step.26.
25	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the Step 27.
		No	Replace the delivery pipe.
26	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 30.
		No	Go to the next step.
27	Connect the fuel pressure gauge between the fuel pump and the high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure with in the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.
28	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
29	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
30	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.12 LACK/LOSS OF POWER (ACCELERATION/CRUISE)[L3 WITH TC]

id010339801800

12	LACK/LOSS OF POWER — ACCELERATION/CRUISE
DESCRIPTION	Performance is poor under load (e.g., powers down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Improper operation of A/C cut-off control • Air leakage or restriction from intake-air system • Loose turbocharger compressor-to-intake manifold duct connecting • Turbocharger rotating assembly binding or dragging • Wastegate valve malfunction (stuck open) • Turbocharger malfunction • Charge air cooler malfunction • Variable swirl system malfunction • Improper operation of electronic throttle control system • Purge solenoid valve malfunction • EGR system malfunction • Brake dragging • Low engine compression • Poor fuel quality • Vacuum leakage • Incorrect signal to ignition coil • Spark plug malfunction • Engine overheating • Throttle body malfunction • Air cleaner restriction or dirty • PCV valve malfunction • Improper valve timing due to jumping out of timing chain • Improper operation of variable valve timing control system • Restriction in exhaust system or three-way catalytic converter (TWC) • Leakage at exhaust manifold or turbocharger mounting flange • Intermittent open or short fuel pump related circuit • Inadequate fuel pressure (high-or low pressure side) • Fuel pressure sensor or related circuit malfunction • Suction control valve or related circuit malfunction (built-in high pressure fuel pump) • Relief valve malfunction (built-in delivery pipe) • High pressure fuel pump malfunction • Improper fuel pump speed control operation • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Fuel injector malfunction • Incorrect fuel injection timing • Erratic signal from CKP sensor • Erratic or no signal from CMP sensor • ECT sensor or related circuit malfunction • Manifold absolute pressure (MAP) sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • MAF/IAT sensor or related circuit malfunction • IAT sensor No.2 or related circuit malfunction • Intermittent open or short circuit MAF sensor, accelerator position sensor, TP sensor and VSS • Clutch slippage **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: • Fuel quality (proper octane, contamination, winter/summer blend) • Air cleaner restriction or dirty • Intake-air system restriction or leakage • Charge air cooler condition (restriction or damaged) • Turbocharger compressor-to-intake manifold duct loose connection • Leakage at exhaust manifold or turbocharger mounting flange • Vacuum leakage • Clutch slippage • Brake dragging Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
3	Is the engine overheating?	Yes	Go to symptom troubleshooting "NO.17 COOLING SYSTEM CONCERN-OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
		No	Go to the next step.
4	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
5	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning parts, according to the inspection results.
6	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable swirl system work properly?	Yes	Visually inspect throttle body (damaged/scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the Variable Swirl Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Perform the Variable Valve Timing Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable valve timing control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
9	Perform the Purge Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the purge control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
10	Perform Fuel Pump Speed Control Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the fuel pump speed control work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
11	Perform the Wastegate Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the wastegate control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.

STEP	INSPECTION	RESULTS	ACTION
12	Connect the M-MDS to DLC-2. Access and monitor following PIDs using the data monitor function. • ECT • MAF • IAT • IAT2 • APP • TP • MAP • FP (Low side pressure line) • VSS Do the PIDs indicate correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
13	Inspect CMP and CKP sensor for following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
14	Remove and shake PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
15	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Perform the Spark Test and repair or replace malfunctioning part according to inspection result. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Spark plug is grayish white: Go to Step 23.
		No	Install spark plugs on original cylinders. Go to the next step.
16	Inspect for restriction in exhaust system and three-way catalytic converter (TWC). Is there any restriction?	Yes	Replace malfunctioning part.
		No	Go to the next step.
17	Remove parts necessary to inspect turbocharger without remove the turbocharger. Inspect if turbocharger compressor wheel is bent, damaged, or interfering with housing on vehicle. (See 01-13B-18 TURBOCHARGER INSPECTION[L3 WITH TC].) Is there any problem?	Yes	Replace turbocharger.
		No	Go to the next step.
18	Inspect turbocharger compressor wheel locknut is loose or has fallen down inside turbocharger. Is there any problem?	Yes	Replace turbocharger.
		No	Go to the next step.
19	Inspect if turbocharger compressor wheel by hand. Does wheel turn easily and smoothly?	Yes	Go to the next step.
		No	Replace turbocharger.
20	Inspect turbocharger turbine wheel is damaged, cracked or interfering with housing on vehicle. **Note** • Inspect all fins on each turbine wheel. Is there any problem?	Yes	Replace turbocharger.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
21	Is any engine oil found inside turbocharger turbine housing?	Yes	Excessive amount of oil is found: Replace turbocharger. Small amount of oil is found: Wipe oil out of vehicle, then Go to the next step.
		No	Go to the next step.
22	Is any engine oil found inside turbocharger compressor housing?	Yes	Wipe oil out vehicle and install all removed parts in Step 16. Then, Go to the next step.
		No	Turbocharger is normal. Install all parts removed in Step 17. Then, Go to the next step.
23	Inspect for leakage in fuel line. Is there any fuel leakage found?	Yes	Repair or replace suspected part.
		No	Go to the next step.
24	Access and monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 27.
		No	Go to the next step.
25	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 30.
		No	Go to the next step.
26	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the delivery pipe.
27	Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. Measure the fuel pressure line of the low pressure side. (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].) Is the fuel pressure within the specification?	Yes	Go to the next step.
		No	Inspect for the following: • Fuel line restriction • Fuel filter clogging If normal replace the fuel pump.
28	Inspect fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
29	Measure compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
30	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.13 KNOCKING/PINGING[L3 WITH TC]

id010339801900

13	KNOCKING/PINGING
DESCRIPTION	Sound is produced when air/fuel mixture is ignited by something other than a spark plug (e.g., hot spot in the combustion chamber).
POSSIBLE CAUSE	• Poor fuel quality • Engine overheating due to cooling system malfunction • Variable swirl valve stuck closed • Improper operation of electronic throttle system • Air leakage or restriction from intake-air system • ECT sensor or related circuit malfunction • MAF sensor or related circuit malfunction • IAT sensor No.1 or related circuit malfunction • IAT sensor No.2 or related circuit malfunction • Incorrect fuel injection timing or amount • Fuel injector malfunction • Knock sensor or related circuit malfunction • Ignition system malfunction • Erratic signal from CMP sensor • Inadequate engine compression • Inadequate fuel pressure (high-pressure side) • Manifold absolute pressure (MAP) sensor or related malfunction • Wastegate valve malfunction (stuck closed) • Charge air cooler malfunction • Fuel pressure sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • Suction control valve malfunction (built-in high pressure fuel pump) • Exhaust system and/or three-way catalytic converter (TWC) restriction • EGR system malfunction **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Access the ECT PID. Verify that the ECT PID is less than 116°C {241°F} during driving. Is ECT PID less than specified?	Yes	Go to the next step.
		No	The cause of this concern could be from the cooling system overheating. Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING." (See 01-03B-60 NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC].)
2	Inspect for the following: • Air leakage or restriction from intake-air system • Fuel quality (proper octane, contamination, winter/summer blend) • Exhaust system and/or three-way catalytic converter (TWC) restriction • Charge air cooler condition (restriction or damaged) Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.

STEP	INSPECTION	RESULTS	ACTION
3	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	**No DTC is displayed:** Go to the next step.
4	Inspect the knock sensor. (See 01-40B-49 KNOCK SENSOR (KS) INSPECTION[L3 WITH TC].) Is the knock sensor normal?	Yes	Go to the next step.
		No	Replace the knock sensor. (See 01-40B-49 KNOCK SENSOR (KS) INSPECTION[L3 WITH TC].)
5	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
6	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the Variable Swirl Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable swirl system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Perform the Wastegate Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the wastegate control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
9	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
10	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
11	Connect the M-MDS to the DLC-2. Access and monitor the following PIDs using the data monitor function. • ECT • MAF • IAT • IAT2 • APP • TP • MAP Do the PIDs indicate correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
12	Access and monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 16.
		No	Go to the next step.
13	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to the Step 15.

STEP	INSPECTION	RESULTS	ACTION
14	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 16.
		No	Replace the delivery pipe.
15	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 17.
		No	Go to the next step.
16	Measure compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressure within the specified?	Yes	Inspect fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].)
		No	Inspect following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service as necessary.
17	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.14 POOR FUEL ECONOMY[L3 WITH TC]

id010339802000

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	• Contaminated air cleaner element • Engine cooling system malfunction • Weak spark • Spark plug malfunction • Poor fuel quality • Erratic signal from CKP sensor • Erratic or no signal from CMP sensor • Fuel pressure sensor or related circuit malfunction • ECT sensor or related circuit malfunction • Manifold absolute pressure (MAP) sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • MAF sensor or related circuit malfunction • Contaminated MAF sensor • IAT sensor No.1 or related circuit malfunction • IAT sensor No.2 or related circuit malfunction • VSS or related circuit malfunction • Variable swirl system malfunction • Improper coolant level • Inadequate fuel pressure (high-pressure side) • Injection timing is incorrect • Fuel injector or related circuit malfunction • High pressure fuel pump malfunction • Fuel leakage • Fuel line restriction • Fuel filter clogging • PCV valve malfunction • Brake dragging • Clutch slippage • A/C system improper operation • Improper valve timing due to jumping out of timing chain • Improper engine compression • Turbocharger malfunction • Charge air cooler malfunction • Exhaust system and/or three-way catalytic converter clogging • EGR system malfunction • Vacuum leakage **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Air cleaner element for contamination • Intake-air system restriction • Fuel quality (proper octane, contamination, winter/summer blend) • Coolant level • Brake dragging • Clutch slippage • Charge air cooler condition (restriction or damaged) • Vacuum leakage • Fuel leakage • MAF sensor contaminated • Exhaust system and/or three-way catalytic converter restriction Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	DTC is displayed: Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	No DTC is displayed: Go to the next step.
3	Perform the Cooling Fan Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
4	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
5	Perform the Variable Swirl Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable swirl system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
6	Perform the Wastegate Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the wastegate control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the A/C Cut-off Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the A/C Cut-off Operation work properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning parts, according to the inspection results.
8	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
9	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is the strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
10	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
11	Connect the M-MDS to the DLC-2. Access and monitor following PIDs using the data monitor function. • ECT • MAF • IAT • IAT2 • APP • TP • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) • MAP • VSS Do the PIDs indicate the correct values according to the engine operating condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
12	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 16.
		No	Go to the next step.
13	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 15.
14	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 16.
		No	Replace the delivery pipe.
15	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 19.
		No	Go to the next step.
16	Inspect the turbocharger. (See 01-13B-18 TURBOCHARGER INSPECTION[L3 WITH TC].) Is there any problem in turbocharger?	Yes	Replace the turbocharger.
		No	Go to the next step.
17	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
18	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
19	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.15 EMISSION COMPLIANCE[L3 WITH TC]

id010339802100

15	EMISSION COMPLIANCE
DESCRIPTION	Fails emissions test.
POSSIBLE CAUSE	• Poor fuel quality • Vacuum lines leakage or blockage • Cooling system malfunction • Engine overheating • Spark plug malfunction • Air leakage from intake-air system • Variable swirl system malfunction • Wastegate control system improper operation • Turbocharger malfunction • Charge air cooler malfunction • Inadequate fuel pressure (high-pressure side) • PCV valve malfunction or incorrect valve installation • EGR system malfunction • Exhaust system and/or three-way catalytic converter restriction • Fuel tank ventilation system malfunction • Charcoal canister damage • Air cleaner element clogging or restriction • Throttle body malfunction • Improper operation of electronic throttle control system • Relief valve malfunction (built-in delivery pipe) • Suction control valve malfunction (built-in high pressure fuel pump) • Improper air/fuel mixture ratio control operation • Erratic or no signal from CMP sensor • Erratic signal from CKP sensor • Front or rear HO2S or related circuit malfunction • ECT or related circuit malfunction • MAF sensor or related circuit malfunction • IAT sensor No.1 or related circuit malfunction • IAT sensor No.2 or related circuit malfunction • Fuel pressure sensor or related circuit malfunction • Accelerator position sensor or related circuit malfunction • TP sensor or related circuit malfunction • Manifold absolute pressure (MAP) sensor or related circuit malfunction • Neutral or clutch switch malfunction • VSS or related circuit malfunction • Fuel line restriction • High pressure fuel pump malfunction • Fuel injector or related circuit malfunction • Incorrect fuel injection timing • Three-way catalytic converter (TWC) malfunction • Engine internal parts malfunction • Excessive carbon is built-up in combustion chamber • Improper engine compression • Improper valve timing **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is the engine overheating?	Yes	Go to symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS - OVERHEATING."
		No	Go to the next step.
2	Is the engine runs cold?	Yes	Go to symptom troubleshooting "NO.18 COOLING SYSTEM CONCERNS - RUNS COLD."
		No	Go to the next step.
3	Connect the M-MDS to the DLC. Perform the self-test function using the M-MDS. Turn the ignition switch to the ON position. Retrieve any DTCs. Is a DTC displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to the next step.
4	Inspect for the following. • Fuel quality (proper octane, contamination, winter/summer blend) • Charge air cooler condition (restriction or damaged) • Air cleaner element (clogging or restriction) • Intake-air system leakage • PCV valve installation • Vacuum line leakage or blockage • Fuel leakage at fuel system • Charcoal canister damaged • Exhaust system and/or three-way catalytic converter restriction Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 4.
5	Perform the EGR system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the EGR system operate properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
6	Perform the TP sweep inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the electronic throttle control system work properly?	Yes	Visually inspect the throttle body (damaged/ scratching.) If normal, go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
7	Perform the Variable Swirl Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the variable swirl system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
8	Perform the Wastegate Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the wastegate control system work properly?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
9	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
10	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
11	Inspect CMP and CKP sensor for the following; • Installation condition (See 01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) • Damaged trigger wheel and camshaft • Open or short circuit in the wiring harnesses Is there any malfunction detected?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
12	Connect the M-MDS to the DLC-2. Access and monitor the following PIDs using the data monitor function. • ECT • MAF • IAT • IAT2 • APP • TP • MAP • VSS • O2S11 • O2S12 • LONGFT1 • SHTFT1 • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) Do the PIDs indicate the correct values according to the engine operating condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
13	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 18.
		No	Go to the next step.
14	Is the vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 17.
15	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 18.
		No	Replace the delivery pipe.
16	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 22.
		No	Go to the next step.
17	Inspect the turbocharger. (See 01-13B-18 TURBOCHARGER INSPECTION[L3 WITH TC].) Is there any problem in turbocharger?	Yes	Replace the turbocharger.
		No	Go to the next step.
18	Inspect the three-way catalytic converter (TWC). Is the TWC normal?	Yes	Go to the next step.
		No	Replace the TWC.
19	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].) Are fuel injectors normal?	Yes	Go to the next step.
		No	Replace the suspected fuel injector. (See 01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
20	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Replace the injector driver module. If the problem remains, overhaul the engine.
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
21	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.16 HIGH OIL CONSUMPTION/LEAKAGE[L3 WITH TC]

id010339802200

16	HIGH OIL CONSUMPTION/LEAKAGE
DESCRIPTION	Oil consumption is excessive.
POSSIBLE CAUSE	• PCV valve malfunction • Improper dipstick • Improper engine oil viscosity • Engine internal parts malfunction • Seal leakage at the compressor or turbine end of turbocharger (indicated by oil in housing on wheel) • Oil leakage

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
2	Verify the following: • Proper dipstick • Proper engine viscosity • Engine oil level Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.
3	Inspect the oil leakage from outside of the engine. Is there any oil leakage found?	Yes	Repair or replace oil leakage part.
		No	Go to the next step.
4	Remove the parts to necessary to inspect turbocharger without remove the turbocharger. Visually inspect for the oil leakage inside turbocharger compressor and turbine housing. is any engine oil found inside turbocharger compressor or turbine housing?	Yes	Excessive amount of oil is found: Replace the turbocharger. Small amount of oil is found: Wipe oil out of vehicle, then go to the next step.
		No	Go to the next step.
5	Is any engine oil found around oil pipes attached on turbocharger center housing?	Yes	If oil leaks from damaged pipe, replace oil pipe. Install the removed parts at Step 4.
		No	Inspect internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings. Then install the removed parts at Step 4.
6	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING[L3 WITH TC]

id010339802300

17	COOLING SYSTEM CONCERNS-OVERHEATING
DESCRIPTION	Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuse • Coolant leakage (engine internal, turbocharger, external) • Excessive A/C system pressure • A/C system operation is improper • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hose damage • Cooling fan inoperative • Condenser fan inoperative • Improper or damaged radiator cap • Coolant overflow system malfunction • Improper drive belt tension • Drive belt damage

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: • Engine coolant level • Coolant leakage (around heater unit in passenger compartment, coolant hoses and/or radiator.) • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Coolant overflow system • Fan rotational direction • Fan rotation direction • Fuses Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.Service if necessary.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Is there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to the next step.
3	Perform the KOEO and KOER self-test function using the M-MDS. (See 01-02B-9 KOEO/KOER SELF TEST[L3 WITH TC].) Is there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to the next step.
4	Start the engine and run it at idle speed. Turn the A/C switch off. Does the A/C compressor disengaged?	Yes	Go to the next step.
		No	Go to symptom troubleshooting "NO.24 A/C ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY." (See 01-03B-70 NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[L3 WITH TC].)
5	Perform the Cooling Fan Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the cooling fan system operate properly?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part, according to inspection results.
6	Is the drive belt normal?	Yes	Go to the next step.
		No	Replace the drive belt.
7	Is there any leakage around heater unit in passenger compartment?	Yes	Inspect and service heater unit for leakage.
		No	Go to the next step.
8	Is there any leakage at coolant hoses and/or radiator?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
9	Cool down the engine. Remove the thermostat and inspect operation. (See 01-12B-10 THERMOSTAT REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-12B-11 THERMOSTAT INSPECTION[L3 WITH TC].) Is thermostat normal?	Yes	Thermostat is normal. Inspect the cylinder block for leakage or blockage.
		No	Access the ECT PID using the M-MDS. Inspect for both ECT PID and temperature gauge readings. If the temperature gauge on instrument cluster indicates normal but ECT PID is not same as temperature gauge reading, inspect the ECT sensor. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) If the temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
10	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.18 COOLING SYSTEM CONCERNS-RUNS COLD[L3 WITH TC]

id010339802400

18	COOLING SYSTEM CONCERNS-RUNS COLD
DESCRIPTION	Engine takes excessive time to reach normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Condenser fan system malfunction • Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect the A/C heater system.
		No	Go to the next step.
2	Does the engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "NO.9 FAST IDLE/ RUNS ON." (See 01-03B-38 NO.9 FAST IDLE/RUNS ON[L3 WITH TC].)
		No	Go to the next step.
3	Cool down the engine. Remove the thermostat and inspect operation. (See 01-12B-10 THERMOSTAT REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-12B-11 THERMOSTAT INSPECTION[L3 WITH TC].) Is thermostat normal?	Yes	Go to the next step.
		No	Replace the thermostat.
4	Perform the Cooling Fan Control System Operation Inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Does the cooling fan system operate properly?	Yes	Access the ECT PID using the M-MDS. Inspect for both ECT PID and temperature gauge readings. If the temperature gauge on instrument cluster indicates normal but ECT PID is not same as temperature gauge reading, inspect the ECT sensor. (See 01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].) If the temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)
		No	Repair or replace malfunctioning part, according to inspection results.
5	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.19 EXCESSIVE BLACK SMOKE[L3 WITH TC]

id010339802500

19	EXHAUST SMOKE
DESCRIPTION	Blue, black, or smoke from the exhaust system
POSSIBLE CAUSE	**Blue smoke (Burning oil):** • PCV valve malfunction • Engine internal oil leakage • Oil leakage at the compressor or turbine end of the turbocharger **White smoke (Water in combustion):** • Cooling system malfunction (coolant loss) • Engine internal coolant leakage • Coolant leakage at the compressor or the turbine end of the turbocharger **Black smoke (Rich fuel mixture):** • Air cleaner restriction • Intake-air system is collapsed or restricted • Leakage at engine intake or exhaust manifold • Wastegate valve malfunction (stuck open) • Excessive fuel pressure • Improper engine compression • Ignition system malfunction • Improper fuel injection timing and amount **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from the exhaust system?	Blue	Burning oil is indicated. Go to the next step.
		White	Water in combustion is indicated. Go to the Step 5.
		Black	Rich fuel mixture is indicating. Go to the Step 6.
2	Remove and shake the PCV valve. Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
3	Remove the parts necessary to inspect turbocharger without remove the turbocharger. Visually inspect for the turbocharger compressor housing. Is any engine oil found inside turbocharger compressor housing?	Yes	Install all parts removed in this step. **Perform the following, according to inspection results. Excessive amount of oil is found:** Replace the turbocharger. **Small amount of oil is found:** Wipe oil out of vehicle, then Go to the next step.
		No	Turbocharger is normal. Install all parts removed in this step. Then, Go to the next step.
4	Inspect for the following engine internal parts. • Damaged valve guide, stems or valve seals • Blocked oil drain passage in cylinder head • Piston ring is not seated, seized or worn • Damage cylinder bore Are there ant problem found?	Yes	Repair or replace suspected parts, according to the inspection results.
		No	Engine internal parts are normal. If other driveability symptoms are present, return to diagnostic index to service additional symptoms.

STEP	INSPECTION	RESULTS	ACTION
5	Does cooling system hold the coolant pressure? (See 01-12B-6 COOLING SYSTEM CAP INSPECTION[L3 WITH TC].)	Yes	Inspect for the following: • Cylinder head gasket leakage • Intake manifold gasket leakage • Cracked or porous engine block If other driveability symptoms are present, return to diagnostic index to service additional symptoms.
		No	Inspect for the cause.
6	Inspect for the following for intake-air system. • Air cleaner restriction • Collapsed or restricted • Leakage Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the suspected part.
7	Connect the M-MDS to the DLC-2. Access following PIDs. • ECT • MAF • IAT • IAT2 • APP • TP • MAP • VSS • O2S11 • O2S12 • LONGFT1 • SHTFT1 • PNP (PCM terminal 1S) • CPP (PCM terminal 1D) Monitor the PIDs under the black smoke appeared engine condition. Do all PID indicate normal according to engine conditions?	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and the the related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
8	Inspect the wastegate. (See 01-13B-17 WASTEGATE ACTUATOR INSPECTION[L3 WITH TC].) Does the wastegate stuck open?	Yes	Perform the wastegate control system operation inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Repair or replace malfunctioning part according to the inspection results.
		No	Go to the next step.
9	Connect the M-MDS to DLC-2. Access and monitor following PIDs using the data monitor function. • ECT • MAF • IAT • IAT2 • APP • TP • MAP • VSS • CPP (PCM terminal 1D) • PNP (PCM terminal 1S) • O2S11 • O2S12 • LONGFT1 • SHTFT1 Do the PIDs indicate correct values under trouble condition? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Inspect and repair or replace suspected parts and related harnesses. If the malfunction remains, perform the intermittent concern troubleshooting procedure. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
10	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 14.
		No	Go to the next step.
11	Is vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 13.

STEP	INSPECTION	RESULTS	ACTION
12	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 14.
		No	Replace the delivery pipe.
13	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Retest Step 16.
		No	Go to the next step.
14	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Inspect or replace the malfunctioning parts, according to the inspection results.
15	Measure the compression pressure for each cylinder. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) Are compression pressures within the specification?	Yes	Inspect the fuel injector for each cylinder. (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].)
		No	Inspect for the following: • Damaged valve seat • Worn valve stem and valve guide • Worn or stuck piston ring • Worn piston, piston ring or cylinder • Improper valve timing Service if necessary.
16	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.20 FUEL ODOR (IN ENGINE COMPARTMENT)[L3 WITH TC]

id010339802600

20	FUEL ODOR (IN ENGINE COMPARTMENT)
DESCRIPTION	Gasoline fuel smell or visible leakage
POSSIBLE CAUSE	• Excessive fuel pressure • Purge solenoid valve malfunction • Fuel system vent system blockage • Evaporative gas leakage • Improper connection of evaporative related vacuum hoses • Charcoal canister malfunction • Fuel leakage from fuel system **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** **• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect fuel leakage at fuel line. Is there any fuel leakage?	Yes	Service if necessary.
		No	Go to the next step.
2	Inspect the vacuum hose routine. (See 01-13B-4 VACUUM HOSE ROUTING DIAGRAM[L3 WITH TC].) Are vacuum hoses routines properly?	Yes	Go to the next step.
		No	Reconnect the vacuum hose.
3	Perform the Evaporative Emission (EVAP) System Leak Inspection. Is there any problem found?	Yes	Repair or replace suspected part according to the inspection results.
		No	Go to the next step.
4	Inspect the airflow of purge solenoid valve. (See 01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC].) Is the purge solenoid airflow properly?	Yes	Go to the next step.
		No	Replace the purge solenoid valve.
5	Connect the M-MDS to the DLC-2. Access the FUEL_PRESPID. Monitor the FUEL_PRES PID while idle and race the engine. Is the FUEL_PRES PID indicate **15 MPa {153 kgf/cm^2, 2175 psi} or less**?	Yes	Inspect the charcoal canister for fuel saturation. If excess amount of liquid fuel is present, replace the charcoal canister.
		No	Inspect the fuel pressure sensor and the high pressure fuel pump. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) (See 01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].)
5	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.21 ENGINE NOISE[L3 WITH TC]

id010339802700

21	ENGINE NOISE
DESCRIPTION	Engine noise under hood
POSSIBLE CAUSE	**Squeal, click or chirp noise:** • Improper engine oil level • Loose installation of solenoid valves • Improper drive belt tension **Rumble or grinding sound noise:** • Loose parts • Fluid revel low or air in power the steering fluid • Improper drive belt tension **Hiss sound noise:** • Vacuum leakage • Loose spark plug • Air leakage from the intake-air system **Rattle noise:** • Loose parts **Rap or roar noise:** • Exhaust system looseness **Excessive noise from turbocharger** • Foreign objects or material in the compressor inlet to the intake manifold ducting or the compressor housing • Carbon built-up in the turbine housing • Turbocharger routing assembly banding or dragging • Loose intake or exhaust ducting systems **Other noise:** • Camshaft friction gear noise or MLA noise • Timing chain noise **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is the noise from the turbocharger?	Yes	Go to Step 8.
		No	Go to the next step
2	Is squeal, click or chirp sound present?	Yes	Inspect the engine oil level, solenoid valves installation or drive belt tension.
		No	Go to the next step.
3	Is rumble or grinding sound present?	Yes	Inspect and repair the following; • Drive belt tension • Loose parts in engine compartment • Power steering system fluid level If normal, perform the power steering fluid line air bleed.
		No	Go to the next step.
4	Is rattle sound present?	Yes	Inspect the location of rattle for loose parts.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
5	Is hiss sound present?	Yes	Inspect and repair the following; • Vacuum leakage • Spark plug looseness • Intake-air system leakage
		No	Go to the next step.
6	Is rap or roar sound present?	Yes	Inspect the exhaust system or loose parts.
		No	Go to the next step.
7	Is knocking noise present?	Yes	Go to symptom troubleshooting "NO.13 KNOCKING/PINGING". (See 01-03B-51 NO.13 KNOCKING/PINGING[L3 WITH TC].)
		No	If noise comes from engine internal, inspect for the friction gear, timing chain or MLA noise.
8	Inspect the intake and exhaust housing system for loose installation. Is there any problem found?	Yes	Repair installation or replace suspected part.
		No	Go to the next step.
9	Remove the parts to necessary to inspect turbocharger without remove the turbocharger. Inspect if turbocharger compressor wheel is bent, damaged, or interfering with housing on vehicle. Is there any problem?	Yes	Replace the turbocharger.
		No	Go to the next step.
10	Inspect the turbocharger compressor wheel locknut is loose or has fallen down inside turbocharger. Is there any problem?	Yes	Replace the turbocharger.
		No	Go to the next step.
11	Turn the turbocharger compressor wheel by hand. Does the wheel turn easily and smoothly?	Yes	Go to the next step.
		No	Replace the turbocharger.
12	Visually inspect the turbine housing. Is there any carbon built-up or foreign material on turbine housing?	Yes	Cle built-up carbon or remove foreign materials. If turbine housing damaged, replace the turbocharger.
		No	Install the removal parts at Step 9, and inspect all turbocharger related parts installed correctly.
13	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.22 VIBRATION CONCERNS (ENGINE)[L3 WITH TC]

id010339802800

22	VIBRATION CONCERNS (ENGINE)
DESCRIPTION	• Vibration from under the hood or driveline
POSSIBLE CAUSE	• Loose attaching bolts or worn parts • Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following components for loose attaching bolts or worn parts: • Cooling fan • Condenser fan • Drive belt and pulley • Engine mounts • Exhaust system Are all items normal?	Yes	Inspect the following systems: • Wheels • Transmission and mounts • Driveline • Suspension Service if necessary.
		No	Readjust or retighten suspect parts installation position. Service if necessary for other parts.

STEP	INSPECTION	RESULTS	ACTION
2	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.23 A/C DOES NOT WORK SUFFICIENTLY[L3 WITH TC]

id010339802900

23	A/C DOES NOT WORK SUFFICIENTLY.
DESCRIPTION	A/C compressor magnetic clutch does not engage when A/C switch is turned on.
POSSIBLE CAUSE	• Improper refrigerant charging amount • Open A/C magnetic clutch • Open circuit between the A/C relay and the A/C magnetic clutch • Poor ground of A/C magnetic clutch • Refrigerant pressure switch is stuck open. • A/C relay is stuck open. • Seized A/C compressor • Open circuit between the A/C switch and the PCM through both the refrigerant pressure switch and the A/C amplifier

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
2	Disconnect the A/C compressor connector. Start the engine and turn the A/C switch on. Is there correct voltage at terminal of A/C compressor magnetic clutch connector? **Specification** **10.5 V or more**	Yes	Inspect for the ground condition of magnetic clutch on A/C compressor. If ground condition is normal, inspect for an open circuit magnetic clutch coil.
		No	Go to the next step.
3	Disconnect the refrigerant pressure switch connector. Connect jumper wire between terminals of A/C high-pressure switch connector. Connect jumper wires between terminals of refrigerant pressure switch connector. Turn the ignition switch to the ON position. Turn A/C switch on and set blower fan to any speed. Does A/C work?	Yes	Inspect the refrigerant pressure switch operation. If switch is normal, go to the next step.
		No	Inspect for the following: • A/C switch is stuck open. • Open circuit between refrigerant pressure switch and PCM terminal 1AU • Open circuit between blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier
4	Remove jumper wire from switch connector. Reconnect connector to refrigerant pressure switch. Start engine and turn A/C switch on. Does fan operate?	Yes	Inspect the whether A/C relay is stuck open. Replace if necessary.
		No	Inspect the following and repair or replace if necessary: • Refrigerant charging amount • A/C compressor for seizure
5	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.le. Retest.		

NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY[L3 WITH TC]

id010339803000

24	A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
DESCRIPTION	A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	• A/C compressor magnetic clutch engagement is stuck. • A/C relay is stuck closed. • Short to ground between A/C switch and PCM • Short to ground circuit between A/C relay and PCM • A/C relay to magnetic clutch circuit shorted to battery power

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
2	Start the engine and idle it. Turn the A/C switch on. Remove the A/C relay. Does the A/C magnetic clutch disengage?	Yes	Inspect for the following: • A/C relay is stuck closed. • Short to ground circuit between A/C relay and PCM terminal 1l. If both items normal, go to the next step.
		No	Inspect if circuit between A/C relay and magnetic clutch shorts to battery power circuit. If circuit is normal, inspect magnetic clutch for stuck engagement or clearance.
3	Disconnect the refrigerant pressure switch connector. Start the engine and turn the A/C switch on. **Note** • A/C should not work when disconnecting connector. If A/C remains working, short to ground circuit may be present. Does A/C remain working?	Yes	Inspect for a short to ground circuit between refrigerant pressure switch and PCM terminal 1AU.
		No	Go to the next step.
4	Reconnect refrigerant pressure switch connector. Turn off A/C switch. **Note** • A/C should not work when turning A/C switch off. If A/C remains working, short to ground circuit may be present. Does A/C remain working?	Yes	Inspect for the following: • Short to ground circuit between A/C switch and A/C amplifier • Short to ground circuit between A/C amplifier and refrigerant pressure switch
		No	Inspect the whether A/C switch is stuck closed.
5	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.le. Retest.		

NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS[L3 WITH TC]

id010339803100

25	A/C IS NOT CUT OFF UNDER WOT CONDITIONS.
DESCRIPTION	A/C compressor magnetic clutch does not disengage under WOT.
POSSIBLE CAUSE	• Accelerator position sensor malfunction • Loosely installed accelerator position sensor.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does the A/C compressor disengage when A/C switch is turned off?	Yes	Go to the next step.
		No	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to appropriate DTC test.
		No	**No DTC is displayed:** Inspect the accelerator position sensor.
3	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.le. Retest.		

NO.26 EXHAUST SULPHUR SMELL[L3 WITH TC]

id010339803200

26	EXHAUST SULPHUR SMELL
DESCRIPTION	Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	• Electrical connectors are disconnected or connected poorly • Charcoal canister malfunction • Vacuum lines are disconnected or connected improperly. • Improper fuel pressure • Poor fuel quality **Warning** **The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any driveability or exhaust smoke concerns present?	Yes	Go to the appropriate flow chart.
		No	Go to the next step.
2	Inspect for the following: • Electrical connections • Vacuum lines • Fuel quality Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.

STEP	INSPECTION	RESULTS	ACTION
3	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
4	Access and monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to Step 8.
		No	Go to the next step.
5	Is vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 7.
6	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to Step 8.
		No	Go to the next step.
7	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 9.
		No	Go to the next step.
8	Inspect the charcoal canister for fuel saturation. Is excess amount of liquid fuel present in canister?	Yes	Replace the charcoal canister.
		No	Inspect the fuel tank vent system. If fuel tank vent system is normal, suggest trying a different brand since sulfur content can vary in different fuels. If fuel tank vent system is not normal, repair or replace the malfunctioning parts.
9	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.le. Retest.		

NO.27 FUEL REFILL CONCERNS[L3 WITH TC]

id010339803300

27	Fuel refill concerns
DESCRIPTION	• Fuel tank does not fill smoothly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Improper use of fuel nozzle • Inadequate fuel filling speed **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
2	Remove the fuel-filler pipe. Make sure nonreturn valve is installed properly. Inspect the nonreturn valve operation. Is nonreturn valve normal?	Yes	Inspect for the following: • Improper use of fuel nozzle • Inadequate fuel filling speed
		No	**Nonreturn valve is installed improperly:** • Reinstall the nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace the nonreturn valve.
3	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.le. Retest.		

NO.28 FUEL FILLING SHUT OFF ISSUES[L3 WITH TC]

id010339803400

28	Fuel filling shut off issues
DESCRIPTION	• Fuel does not shut off properly.
POSSIBLE CAUSE	• Clogged EVAP pipes • Nonreturn valve malfunction • Fuel shut-off valve malfunction • Fuel nozzle malfunction • Fuel nozzle is not inserted correctly. **Warning** • **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** **— Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** **— Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC test.
		No	**No DTC is displayed:** Go to the next step.
2	Remove the fuel-filler pipe. Make sure nonreturn valve is installed properly. Inspect the nonreturn valve operation. Is nonreturn valve normal?	Yes	Inspect for the following: • Improper use of fuel nozzle • Fuel is not inserted correctly. • Inspect fuel shut-off valve.
		No	**Nonreturn valve is installed improperly:** • Reinstall the nonreturn valve to proper position. **Nonreturn valve does not operate properly:** • Replace the nonreturn valve.
3	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

NO.29 SPARK PLUG CONDITION[L3 WITH TC]

id010339803600

29	SPARK PLUG CONDITION
DESCRIPTION	Incorrect spark plug condition
POSSIBLE CAUSE	**Note** • Inspecting the condition of the spark plugs can determine whether a problem is related to a specific cylinder or possibly all cylinders. **Wet/carbon stuck on specific plug:** • Spark—Weak, not visible • Air/fuel mixture—Excessive fuel injection volume • Compression—No compression, low compression • Malfunctioning spark plug **Grayish white with specific plug:** • Air/fuel mixture—Insufficient fuel injection volume • Malfunctioning spark plug **Wet/carbon is stuck on all plugs:** • Spark—Spark weak • Air/fuel mixture—Too rich • Compression—Low compression • Clogging in intake/exhaust system **Grayish white with all plugs:** • Air/fuel mixture—Too lean **Warning** **The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:** • **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.** • **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual.** **(See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)** **(See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)** **Caution** • **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove all the spark plugs. Inspect the spark plug condition. Is the spark plug condition normal?	Yes	Troubleshooting completed.
		No	**Specific plug is wet or covered with carbon:** Go to the next step. **Specific plug looks grayish white:** Go to Step 9. **All plugs are wet or covered with carbon:** Go to Step 11. **All plugs look grayish white:** Go to Step 19.
2	Is the spark plug wet/covered with carbon from engine oil?	Yes	Inspect all areas related to oil.
		No	Go to the next step.
3	Inspect the spark plugs for the following: • Cracked insulator • Heat range • Air gap • Worn electrode Is the spark plug normal?	Yes	Go to the next step.
		No	Replace the spark plug.
4	Inspect the compression pressure at the suspected malfunctioning cylinder. Is the compression pressure correct? (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].)	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.
5	Install all the spark plugs. Perform the spark test at the suspected malfunctioning cylinder. Is a strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.
6	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Inspect the suspected cylinders fuel injector for the following: • Open or short circuit in the fuel injector (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].)
		No	Go to the next step.
7	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the delivery pipe.
8	Inspect the high pressure fuel pump. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the high pressure fuel pump normal?	Yes	Replace the delivery pipe. Retest Step 6 If the FUEL_PRES PID indication is other that the specification, replace the high pressure fuel pump.
		No	Replace the high pressure fuel pump.
9	Inspect the spark plug for the following. • Heat range • Air gap Is the spark plug normal?	Yes	Go to the next step.
		No	Replace the spark plug.
10	Perform the KOER self-test function using the M-MDS. (See 01-02B-9 KOEO/KOER SELF TEST[L3 WITH TC].) Is the suspected cylinder injector circuit related DTC (P0201, P0202, P0203 or P0204) present?	Yes	Go to appropriate the DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Inspect the suspect cylinder fuel injector for the following: • Resistance (See 01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].)
11	Is the air cleaner element free of blockage?	Yes	Go to the next step.
		No	Replace the air cleaner element.
12	Perform the spark test. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is a strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.

STEP	INSPECTION	RESULTS	ACTION
13	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Go to step 16.
		No	Go to the next step.
14	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the delivery pipe.
15	Inspect the high pressure fuel pump. (See 01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].) Is the high pressure fuel pump normal?	Yes	Replace the delivery pipe. Retest Step 13. If the FUEL_PRES PID indication is other that the specification, replace the high pressure fuel pump.
		No	Replace the high pressure fuel pump.
16	Inspect the following PIDs: • ECT • O2S11 (When engine can be started) • MAF (See 01-40B-7 PCM INSPECTION[L3 WITH TC].) Are the PIDs normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.
17	Perform the purge control inspection. (When engine can be started) (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].) Is the purge control correct?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.
18	Perform the compression inspection. Is the compression correct?	Yes	Inspect for clogging in the exhaust system.
		No	Repair or replace the malfunctioning parts.
19	When the engine cannot be started, inspect the intake-air system for air leakage. When the engine can be started, perform the intake manifold vacuum inspection. Is air sucked in from the intake-air system?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
20	Access and monitor the FUEL_PRES PID. Is the FUEL_PRES PID value within the specification? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Inspect for the following PIDs: • ECT • O2S11 • O2S12 • MAF (See 01-40B-7 PCM INSPECTION[L3 WITH TC].) Inspect the PCM ground condition.
		No	Go to the next step.
21	Is vehicle accelerate performance normally?	Yes	Go to the next step.
		No	Go to Step 13.
22	Inspect the fuel pressure sensor. (See 01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].) Is the fuel pressure sensor normal?	Yes	Go to the next step.
		No	Replace the delivery pipe.
23	Replace the high pressure fuel pump. Monitor FUEL_PRES PID. Is the FUEL_PRES PID value within the specified? (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)	Yes	Troubleshooting is completed. Go to Step 16.
		No	Inspect following PIDs. • ECT • O2S11 • O2S12 • MAF (See 01-40B-7 PCM INSPECTION[L3 WITH TC].) Inspect PCM ground condition.
24	Verify test results. • If normal, return to the diagnostic index to service any additional symptoms. • If a malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC]

id010339800400

Vibration Method

- If a malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

Note

- There are several reasons why the vehicle or engine vibration could cause an electrical malfunction. Check the following:
  - — Connectors are not fully seated.
  - — Wiring harnesses do not have full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause a wiring harness to become pinched between parts.
- The connector joints, points of vibration, and places where the wiring harnesses pass through the firewall and body panels are the major areas to be checked.

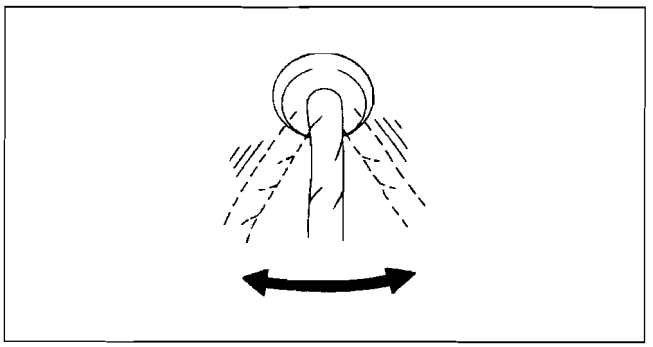
Inspection Method for Switch Connectors or Wires

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note

- If engine starts and runs, perform the following steps during idle.

3. Access the PIDs for the switch you are inspecting.
4. Turn the switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, check for a poor connection.



atraaw00003048

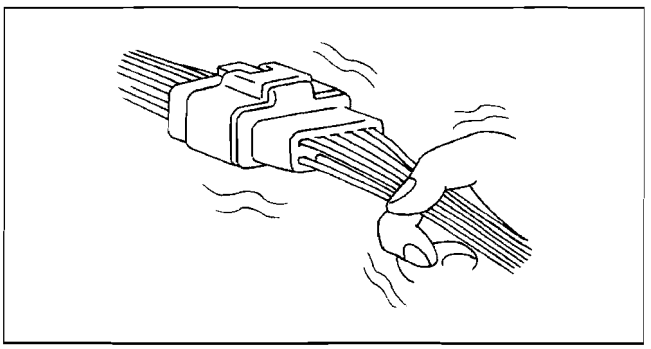
Inspection Method for Sensor Connectors or Wires

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note

- If the engine starts and runs, perform the following steps during idling.

3. Access the PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, check for poor connection.



atraaw00003049

Inspection Method for Sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps during idle.

3. Access the PIDs for the switch you are inspecting.
4. Shake the sensor slightly with your finger.
   - If the PID value is unstable or a malfunction occurs, check for a poor connection or a poorly mounted sensor or both.

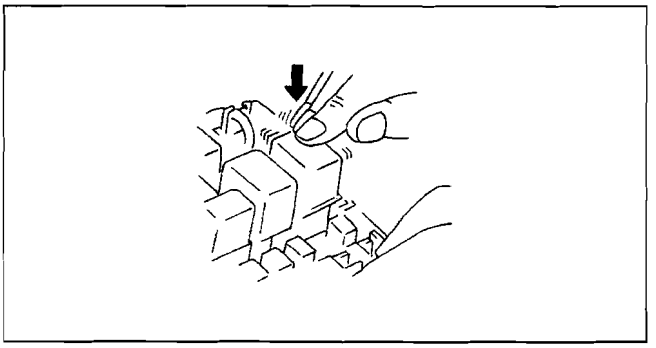
Inspection Method for Actuators or Relays

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If engine starts and runs, perform the following steps during idling.

3. Prepare the output state control function for actuators or relays that you are inspecting.
4. Shake the actuator or relay with your finger for **3 s** after the output state control function is activated.
   - If a variable click sound is heard, check for a poor connection or a poorly mounted actuator or both, or the relay.

Note
- Shake the relays too strongly may result in open circuits.



atraaw00003050

Water Sprinkling Method

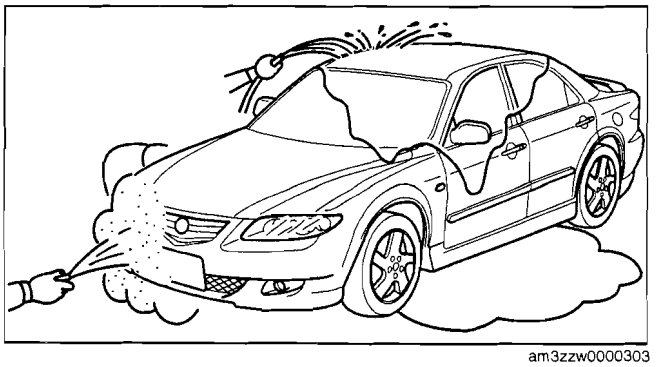
If a malfunction occurs only during high humidity or rainy/snowy weather, perform the following steps:

Caution
- **Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**
- **If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.**

1. Connect the M-MDS to the DLC-2 if you are inspecting sensors or switches.
2. Turn the ignition switch to the ON position (Engine off).

Note
- If the engine starts and runs, perform the following steps is idling.

3. Access the PIDs for the sensor or the switch if you are inspecting sensors or switches.
4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
   - If the PID value is unstable or a malfunction occurs, repair or replace parts if necessary.



am3zzw0000303

ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC]

id010339803700

Input Signal System Investigation Procedure

1. Find an unusual signal. (See 01-03B-79 Finding unusual signals.)
2. Locate the source. (See 01-03B-79 Locating the source of unusual signals.)
3. Repair or replace the defective part.
4. Confirm that the unusual signal has been erased.

Finding unusual signals

While referring to 01-02B-7 ON-BOARD DIAGNOSTIC TEST[L3 WITH TC], use the PID/DATA monitor and record function to inspect the input signal system relating to the problem.

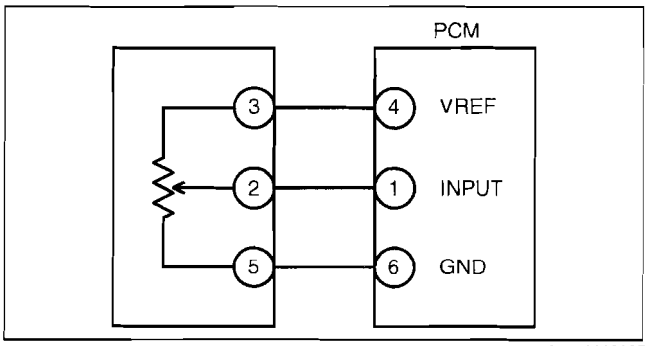
1. Start the engine and idle the vehicle. You can assume that any signals that are out of specification by a wide margin are unusual.
2. When recreating the problem, any sudden change in the monitor input signals that is not consciously created by the driver can be determined as unusual.

Locating the source of unusual signals

Caution

- **Compare the M-MDS monitor voltage with the measurement voltage using the digital measurement system function. If you use another tester, a misreading may occur.**
- **When measuring the voltage, attach the tester ground to the ground of the PCM that is being tested, or to the engine itself. If this is not done, the measured voltage and actual voltage may differ**
- **After connecting the pin to a waterproof coupler, confirm continuity and measure the voltage, and inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the wiring harness or terminal from water damage, leading to problems with the vehicle.**

Variable resistance type 1 (TP sensor and EGR boost sensor)



am3zzw0000307

Investigate the input signal system for variable resistance type 1

1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
     — Wiring harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and M-MDS voltages are the same, inspect for the following points concerning the sensor connector:
     — Female terminal opening is loose.
     — Coupler (pin holder) damage
     — Pin discoloration (blackness)
   - If there are no problems, proceed to next investigation below.

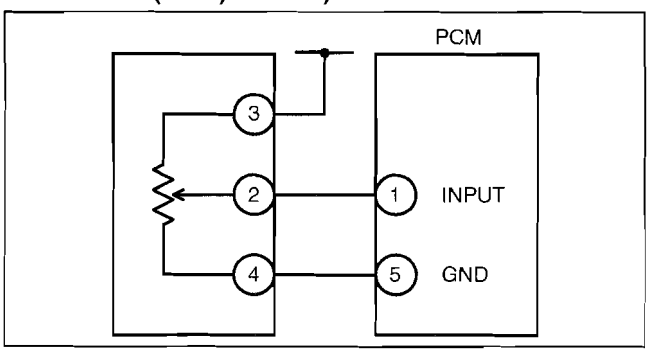
Investigate the standard power supply system for variable resistance type 1

- Confirm that the #3 terminal is at **5 V**.
  - — If the measured voltage on the #3 terminal is **5 V**, inspect the following points on the sensor connector.
  - — If there is no problem, inspect for the following:
    - Female terminal opening loose
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  - — If the #3 terminal measures other than **5 V**, inspect for the following:
    - Open or short circuit in wiring harness
    - Wiring harness/pin crimp is loose or disconnected.

Investigate the ground system for variable resistance type 1

- Confirm that terminal sensor #5 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not, inspect for the following:
    - Open or short circuit in wiring harness
    - Female terminal opening is loose causing an open or short circuit in wiring harness
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Wiring harness/pin crimp is loose or disconnected.

Variable resistance type 2 (fuel tank level sensor and mass air flow (MAF) sensor)



am3zzw0000307

Investigate the ground system for variable resistance type 2

- Confirm that terminal sensor #4 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - — If not at **0 V**, inspect for the following:
    - Open circuit in wiring harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Wiring harness/pin crimp is loose or disconnected.

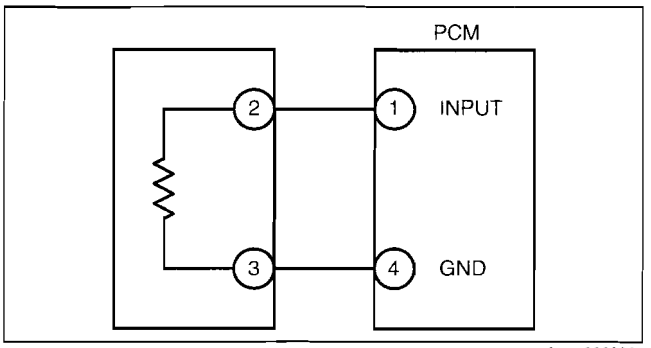
Investigate the input signal system for variable resistance type 2

1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and M-MDS voltages are the same, inspect the following points concerning the sensor connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the electrical supply system for variable resistance type 2

- Confirm that the sensor #3 terminal is **B+**.
  - — If the measured voltage on the #3 terminal is **B+**, inspect the following points on the sensor connector.
  - — If there is no problem, inspect for the following:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
  - — If the #3 terminal measures other than **B+**, inspect the following:
    - Open or short circuit in wiring harness
    - Wiring harness/pin crimp is loose or disconnected.

Thermistor type (IAT sensor and ECT sensor)



am3zzw0000307

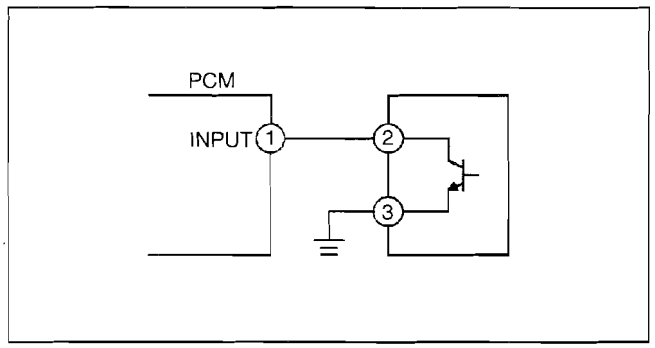
Investigate the input signal system for thermistor type

1. When an unusual signal is received, measure the #1 PCM terminal voltage.
   - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
   - If there is a difference of **0.5 V or more**, inspect the following points concerning the PCM connector:
     - — Female terminal opening loose
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
   - If there is a **0.5 V or more** difference between the sensor and M-MDS voltages, inspect the wiring harness for open or short circuits.
   - If the sensor and M-MDS voltages are the same, inspect the following points concerning the sensor connector:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
   - If there are no problems, proceed to next investigation below.

Investigate the ground system for thermistor type

- Confirm that terminal sensor #3 is at **0 V**.
  - — If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
  - — If not, inspect for the following:
    - Open circuit in wiring harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Wiring harness/pin crimp is loose or disconnected.

VSS



am3zzw0000307

1. Measure the #1 PCM terminal voltage and confirm that it is at **0 V** or **5 V** when the ignition switch to the ON position and the engine is idling.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
   - If not, inspect the following points concerning the PCM connector.
   - If there is no problem, inspect for the following:
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage and confirm that it is at **0 V** or **5 V** when the ignition switch to the ON position and the engine is idling.
   - If it is at **0 V** or **5 V**, intermittent concern exists. (See 01-03B-77 INTERMITTENT CONCERN TROUBLESHOOTING[L3 WITH TC].)
   - If not, inspect the following points concerning the sensor connector:
   - If there is no problem, inspect for the following.
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.
3. Confirm that the #3 terminal switch voltage is at **0 V**.
   - If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
     - — If necessary, replace the sensor.
   - If not, inspect for the following:
     - — Open circuit in wiring harness
     - — Female terminal opening is loose.
     - — Coupler (pin holder) damage
     - — Pin discoloration (blackness)
     - — Wiring harness/pin crimp is loose or disconnected.

Main Relay Operation Inspection

1. Verify that the main relay clicks when the ignition switch is turned to ON position and then off.
   - If there is no operation sound, inspect the following:
     - — Main relay (See 09-21-3 RELAY INSPECTION.)
     - — Wiring harness and connector between ignition switch and main relay terminal A.
     - — Wiring harness and connector between PCM terminal 1AT and main relay terminal B.

Intake Manifold Vacuum Inspection

1. Verify air intake hoses are installed properly.
2. Start the engine and run it is idling.
3. Disconnect the vacuum hose between the intake manifold and purge solenoid valve from the intake manifold side.
4. Connect a vacuum gauge to the intake manifold and measure the intake manifold vacuum.
   - If not as specified, inspect the following:

Specification
More than 60 kPa {450 mmHg, 18 inHg}

Note
- Air suction can be located by the engine speed change when lubricant is sprayed on the area where suction is occurring.
  - — Air suction at throttle body, charge air cooler, intake manifold and PCV valve installation points
  - — EGR valve (stuck open)
  - — Engine compression

Electronic Throttle Control System Inspection
Engine coolant temperature compensation inspection

1. Connect the M-MDS to the DLC-2.
2. Select the following PIDs:
   - ECT
   - IAT
   - RPM
3. Verify that the engine is cold, then start the engine.
4. Verify that the engine speed decreases as the engine warms up.
   - If the engine speed does not decrease or decreases slowly, inspect the following:
     - — ECT sensor and related wiring harness
       (See 01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].)
     - — Electronic throttle body and related wiring harness

Load compensation inspection

1. Start the engine and run it is idling.
2. Connect the M-MDS to the DLC-2.
3. Verify that DTC P0506 or P0507 is not displayed.
   - If DTC P0506, or P0507 is displayed, perform the DTC inspection.
     (See 01-02B-14 DTC TABLE[L3 WITH TC].)
4. Select the RPM PID.

Note
- Excludes temporary idle speed drop just after the loads are turned on.

5. Verify that the engine speed is within the specification under each load condition.
   - If the load condition is not as specified, inspect the following:
     - — A/C switch and related wiring harness
     - — Fan switch and related wiring harness
     - — PSP switch and related wiring harness
       (See 01-40B-24 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION[L3 WITH TC].)

Engine speed

Load condition		Engine speed (rpm)*1
No load		650—750
E/L operating		650—750
P/S operating		650—750
A/C operating*2	Refrigerant pressure low*3	700—800
	Refrigerant pressure high*4	700—800

*1 : Neutral
*2 : A/C switch and fan switch are on.
*3 : Refrigerant pressure switch (middle pressure) is off.
*4 : Refrigerant pressure switch (middle pressure) is on.

Throttle position (TP) sweep inspection

1. Connect the M-MDS to the DLC-2.
2. Reform the KOER self-test function.
   (See 01-02B-9 KOEO/KOER SELF TEST[L3 WITH TC].)
3. Verify that none of the following DTCs are displayed:
   - P0122, P0123, P0222, P0223, P2100, P2101, P2102, P2103, P2107, P2108, P2119, P2122, P2123, P2127, P2128, P2135, P2138
     — If any one DTC is displayed, perform the DTC inspection.
4. Access the TP_REL PID.
5. Verify that the PID reading is within the CTP value. (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
   - If the PID reading is out of range, perform the following:
     — Remove the air duct from the throttle valve body.
     — Verify that the throttle valve opens when the accelerator pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and the related wiring harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and the related wiring harness.
6. Gradually depress the throttle pedal and verify that the PID reading increases lineally.
   - If the PID reading drops momentarily, inspect the following:
     — Throttle position sensor
7. Fully depress the throttle pedal and verify that the PID reading is within the WOT value. (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
   - If the PID reading is out of range, perform the following:
     — Remove the air duct from throttle valve body with connector connected.
     — Verify that the throttle valve opens when throttle pedal is depressed.
       - If the throttle valve opens, inspect the throttle position sensor and the related wiring harness.
       - If the throttle valve does not open, inspect the throttle actuator control motor and the related wiring harness.

Variable Swirl System Operation Inspection

1. Connect the M-MDS to the DLC-2.
2. Access the ECT PID.
3. Verify that the ECT PID is **below 60°C {140°F}**.
4. Start the engine.
5. Inspect the rod operation under the following conditions:

Rod operation

Engine speed	3,750 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

If the rod operation is not specified, inspect as follows:

1. Perform the KOER self-test using the M-MDS and verify that DTCs No. P2004, P2006, P2009 or P2010 are not displayed.
   - If DTC No. P2004, P2006, P2009 or P2010 are displayed, perform DTC inspection.
     (See 01-02B-14 DTC TABLE[L3 WITH TC].)

If simulation function of M-MDS is used:

1. Turn the ignition switch to the ON position. (Engine off)
2. Turn the variable swirl solenoid valve from off to on using the IMRC PID and verify that the operation sound of the solenoid valve is heard.
   - If the operation sound is not heard, replace the variable swirl solenoid valve.
   - If the operation sound is not heard, inspect the following:
     — Vacuum hose and vacuum chamber for looseness or damage
     — Shutter valve actuator
     — Check valve is stuck open or closed
     — Shutter valve cannot move smoothly

If simulation function of M-MDS is not used:

1. Inspect variable swirl solenoid valve.
   - If the variable swirl solenoid valve is not normal, replace the variable swirl solenoid valve.
   - If the variable swirl solenoid valve is normal, inspect the following:
     — Vacuum hose and vacuum chamber for looseness or damage
     — Shutter valve actuator
     — Check valve is stuck open or closed
     — Shutter valve cannot move smoothly

Fuel Injector Operation Inspection
If simulation function of M-MDS is used:

STEP	INSPECTION		ACTION
1	Start the engine and warm it up until normal operating temperature. Connect the M-MDS to DLC-2. Select the INJ#1, INJ#2, INJ#3, and INJ#4 PIDs. Turn the fuel injector from on to off using the PIDs for each cylinder. Does the engine speed drop?	Yes	Fuel injector work properly
		No	**Engine speed does not drop an any cylinder:** Go to the next steps. **Engine speed drops on some cylinders:** Go to step 3.
2	Perform the Main Relay Operation Inspection. (See 01-03B-82 Main Relay Operation Inspection.) Does the main relay work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts.
3	Inspect the fuel injector of the suspected cylinder. Is the fuel injector normal?	Yes	Inspect the following for the suspected cylinder. • Fuel injector power and/or ground systems related wiring harness and connectors. If all items normal replace the PCM. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Replace the fuel injector.
4	Perform KOER self-test function using the M-MDS. (See 01-02B-9 KOEO/KOER SELF TEST[L3 WITH TC].) Are DTCs P0201, P0202, P0203 and/or P0204 present?	Yes	Go to the appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
5	Inspect the fuel injector of the suspected cylinder. Is the fuel injector normal?	Yes	Inspect the following for the suspected cylinder: • PCM terminals (pulled-out pins, corrosion) • Injector driver module terminals (pulled-out pins, corrosion) • Fuel injector terminals (pulled-out pins, corrosion) If all items are normal replace the PCM. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
		No	Replace the fuel injector.

If simulation function of M-MDS is not used:

STEP	INSPECTION		ACTION
1	Perform the KOER self-test function using the M-MDS. (See 01-02B-9 KOEO/KOER SELF TEST[L3 WITH TC].) Are DTCs P0201, P0202, P0203 and/or P0204 present?	Yes	Go to appropriate DTC test. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
2	Inspect the fuel injector for each cylinder. Is the fuel injector normal?	Yes	Go to the next step.
		No	Replace the fuel injector.
3	Inspect the following for the suspected cylinder: • Fuel injector power and/or ground system related wiring harnesses and connectors. • PCM terminals (pulled-out pins, corrosion) • Fuel injector terminals (pulled-out pins, corrosion) Are all items normal?	Yes	Inspect PCM terminal voltage of fuel injector signal
		No	Repair or replace malfunctioning parts.

Fuel Cut Control System Inspection

Note
- This inspection has to be performed after the Fuel Injector Operation Inspection.

If simulation function of M-MDS is used:
1. Warm up the engine and idle it.
2. Connect the M-MDS to the DLC-2.
3. Select the RPM and the FUELPW1 PIDs.
4. Monitor both PIDs while performing the following steps.
   1. Depress the accelerator pedal and increase the RPM PID to **4,000 rpm**.
   2. Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the FUELPW1 PID is **0 msec.**, and **2—5 msec**. when the RPM PID drops **below 1,200 rpm**.
   - If not as specified, inspect the following.
     — ECT sensor and related wiring harness
     (See 01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].)
     — Neutral switch and related wiring harness
     (See 01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC].)
     — Clutch switch and related wiring harness
     (See 01-40B-23 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC].)

If simulation function of M-MDS is not used:
1. Warm up the engine and idle it.
2. Measure the fuel injector control signal wave profile using the oscilloscope while performing the following steps.
   1. Depress the accelerator pedal and increase the engine speed to **4,000 rpm**.
   2. Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the wave profile constant **B+**, and the wave appears when the engine speed drops **below 1,200 rpm**.
   (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
   - If not as specified, inspect the following.
     — ECT sensor and related wiring harness
     (See 01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].)
     — Neutral switch and related wiring harness
     (See 01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC].)
     — Clutch switch and related wiring harness
     (See 01-40B-23 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC].)

Fuel Pump Operation Inspection
If simulation function of M-MDS is not used:
1. Connect the M-MDS to the DLC-2.
2. Remove the fuel-filler cap.
3. Turn the ignition switch to the ON position.
4. Turn the fuel pump relay from off to on using the FP PID and inspect if the operation sound of the fuel pump is heard.
   - If no operation sound is heard, proceed to the next step.
5. Measure the voltage at the wiring harness side fuel pump connector terminal B with the FIP PID turned on.
   - If the voltage is as specified, inspect the following:
     — Fuel pump continuity
     — Fuel pump ground
     — Wiring harness between the fuel pump relay and PCM terminal 1H
   - If not as specified, inspect the following:
     — Fuel pump relay
     — Fuel pump speed control relay
     — Wiring harness connector (Main relay-fuel pump relay-fuel pump resister-fuel pump.)

Specification
8.0—11.5 V (Ignition switch at ON)

If simulation function of M-MDS is not used:

Caution
- **Connecting the wrong check connector terminal may possibly cause a malfunction. Carefully connect the specified terminal only.**

1. Short the check connector terminal F/P to body ground using a jumper wire.
2. Remove the fuel-filler cap.
3. Turn the ignition switch to the ON position.
4. Verify that the fuel pump operation sound is heard.
   - If no operation sound is heard, proceed to the next step.
5. Measure the voltage at wiring harness side fuel pump connector terminal B.
   - If the voltage is as specified, inspect the following:
     — Fuel pump continuity
     — Fuel pump ground
     — Wiring harness between the fuel pump relay and PCM terminal, 1H
   - If not as specified, inspect the following:
     — Fuel pump relay
     — Fuel pump speed control relay
     — Wiring harness connector (Main relay – fuel pump relay – fuel pump resister – fuel pump.)

Specification
8.0—11.5 V (Ignition switch at on)

Fuel Pump Control System Inspection
If simulation function of M-MDS is used:
1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Select the FP PID.
4. Turn the fuel pump relay from off to on and inspect if the operation sound of the fuel pump relay is heard.
   - If no operation sound is heard, inspect the fuel pump relay.
   - If the fuel pump relay is normal, inspect the following:
     — Wiring harness and connectors (Main relay – fuel pump relay – PCM terminal 1H)

If simulation function of M-MDS is not used:
1. Crank the engine and verify that the fuel pump relay operation sound is heard.
2. If the operation sound is not heard, inspect the following:
   - Fuel pump relay
   - Wiring harness and connectors (Main relay – fuel pump relay – PCM terminal 1H)

Fuel Pump Speed Control Inspection
If simulation function of M-MDS is used:
1. Perform the Fuel Pump Operation Inspection.
2. Connect the M-MDS to the DLC-2.
3. Turn the ignition switch to the ON position.
4. Turn the fuel pump speed control relay from off to on using the FPRR PID and verify that the fuel pump speed control relay operation sound is heard.
   - If the operation sound is not heard, inspect the following:
     — Fuel pump speed control relay
     — Wiring harness and connectors (Main relay - fuel pump speed control relay - PCM terminal 4P)
5. Start the engine and run it is idling.
6. Remove the fuel-filler cap.
7. Turn the fuel pump speed control relay from off to on using the FPRR PID and inspect if the operation sound frequency of the fuel pump is higher than when the FPRR PID is off.
   - If it cannot be verified, inspect the following:
     — Fuel pump resister
     — Wiring harness and connectors (open circuit at fuel pump speed control relay terminal C - fuel pump relay terminal D)

If simulation function of M-MDS is not used:
1. Perform the fuel pump operation inspection.
2. Verify that fuel pump relay operation sound is heard, while cranking the engine.
   - If the operation sound is not heard, inspect the following:
     — Fuel pump relay
     — Wiring harnesses and connectors (Main relay—fuel pump relay—PCM terminal 4Q)
3. Remove the fuel-filler cap.
4. Verify that the fuel pump unit operation sound frequency at cranking is higher than during idle.
   - If it cannot verified, inspect for the following:
     — Fuel pump resister
     — Fuel pump relay
     — Wiring harnesses and connectors (open circuit at fuel pump relay terminal C—fuel pump terminal B)

Spark Test

1. Disconnect the fuel pump relay.
2. Disconnect the injector driver module connector.
3. Verify that each ignition coil and connector is connected properly.
4. Inspect the ignition system in the following procedure.
5. Clear the DTC from PCM memory using the M-MDS, after perform the spark test procedures and reconnect the injector driver module connector.

Warning

- **High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.**

STEP	INSPECTION		ACTION
1	• Disconnect the ignition coil from the spark plugs. • Remove the spark plugs. • Verify that the spark plugs do not have carbon deposits. • Are the spark plugs normal?	Yes	Go to the next step.
		No	Perform no-load racing at 4,000 rpm for 2 min, 2 times to burn off the carbon deposits. Repeat Step 1.
2	• Inspect the spark plugs for damage, wear, and proper plug gap. • Are the spark plugs normal?	Yes	Go to the next step.
		No	Replace spark plugs, then go to the next step.
3	• Reconnect the spark plugs to the ignition coil. • Ground the spark plugs to the engine. • Is a strong blue spark visible at each cylinder while cranking the engine?	Yes	Ignition system is normal.
		No	**Some cylinders do not spark:** • Go to the next step. **All cylinders do not spark:** • Go to Step 5.
4	• Inspect the following wiring harnesses for an open or short circuit: — Ignition coil No.1 terminal C—PCM terminal 2BA — Ignition coil No.2 terminal C—PCM terminal 2AW — Ignition coil No.3 terminal C—PCM terminal 2AX — Ignition coil No.4 terminal C—PCM terminal 2AT • Are the wiring harnesses normal?	Yes	Inspect and replace the ignition coil.
		No	Repair or replace the malfunctioning part, then go to Step 1.
5	• Measure the voltage at terminal A in each ignition coils. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the power supply circuit of ignition coils.
6	• Does the PCM connector or ignition coil connectors have poor connection?	Yes	Repair or replace the connector, then go to Step 1.
		No	Go to the next step.
7	• Are the following parts normal? — CKP sensor and crankshaft pulley	Yes	Inspect for an open or short circuit in the wiring harness and connector of the CKP sensor.
		No	Repair or replace the malfunctioning part, then go to Step 1.

EGR Control System Inspection

If simulation function of M-MDS is used:

1. Crank the engine and verify that the EGR valve operation (initial operation) sound is heard.
   - If the operation sound is not heard, connect the M-MDS to the DLC-2 and verify that the DTC P0403 is shown. Perform the DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
2. Start the engine run it is idling.
3. Increase the step value of the EGR valve from **0 to 40** using the SEGR PID of the simulation function.
4. Operate the EGR valve and inspect if the engine speed becomes unstable or the engine stalls.
   - If the engine speed does not change, proceed to the following.
     1. Stop the engine.
     2. Remove the EGR valve.
     3. Connect the EGR valve connector.
     4. Turn the ignition switch to the ON position.
     5. Increase the step value of EGR valve from **0 to 40** using SEGRP PID.
     6. Verify that the EGR valve operates according to the SEGRP PID.
        - If the EGR valve is operated, clean the EGR valve and the EGR gas passage.
        - If the EGR valve does not operate, replace the EGR valve.

5. Start the engine and warm it up completely.
6. Access the following PIDs.
   - ECT, RPM, SEGRP, APP1, APP2, TP_REL, VSS
7. Idle the vehicle and verify that the SEGRP value is **0**.
8. Put the vehicle in drive.
9. Depress the accelerator pedal and verify that the SEGRP value increases.
   - If the SEGRP value does not increase, inspect the VSS, TP and ECT PIDs. (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
10. Stop the vehicle and verify that the SEGRP value is returns to **0**.

If simulation function of M-MDS is not used:

1. Verify that EGR valve operation (initial operation) sound is heard when the ignition switch is turned to the ON position.
   - If the operation sound is not heard, connect the M-MDS to the DLC-2 and verify that the DTC P0403 is shown. Perform the DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
2. Start the engine and idle it.
3. Warm up the engine to normal operating temperature.
4. Select the following PIDs:
   - ECT, RPM, SEGRP, APP1, APP2, TP_REL, VSS
5. Let the vehicle idle and verify that the SEGRP value is **0**.
6. Put the vehicle in drive.
7. Depress the accelerator pedal and verify that the SEGRP value is increased.
   - If the EGR valve increases, inspect the following:
     — EGR valve (stuck open or closed)
     — Wiring harness and connectors (Main relay – EGR valve – PCM)
   - If the SEGRP value does not increase, inspect the VSS, APP1, APP2, TP_REL and ECT PIDs. (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
8. Stop the vehicle and verify that the SEGRP value returns to **0**.

Purge Control System Inspection
If simulation function of M-MDS is used:

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
   - If there is a vacuum, inspect the following:
     — Wiring harness and connectors (Purge solenoid valve - PCM terminal 2AB)
     — Purge solenoid valve (stuck open)
4. Connect the M-MDS to the DLC-2 and verify that the DTC P0403 is displayed. Perform the DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
5. Select the EVAPCP PID.
6. Increase the duty value of the purge solenoid valve to **50%** and inspect if the operation sound of the valve is heard.
   - If the operation sound is heard, inspect for loose or damaged vacuum hoses. (Intake manifold - purge solenoid valve - charcoal canister)
   - If the operation sound is not heard, perform the purge solenoid valve inspection.
7. Warm up the engine to normal operating temperature.
8. Monitor the EVAPCP PID using the M-MDS, and drive the vehicle **approx. 2000 rpm** for **30 s** or more.
   - If the EVAPCP PID is **0%**, inspect the following.
     — MAF, APP1, APP2, TP_REL and LOAD PIDs.

If simulation function of M-MDS is not used:

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
   - If there is vacuum, inspect the following:
     — Wiring harness and connectors (Purge solenoid valve-PCM terminal, 2AB)
     — Purge solenoid valve
4. Warm up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect the M-MDS to the DLC-2 and verify that the DTC P0443 is shown. Perform DTC inspection. (See 01-02B-14 DTC TABLE[L3 WITH TC].)
7. Turn the ignition switch to the ON position.
8. Select the ECT PID.

9. Verify that the engine coolant temperature is above **60°C {140°F}**.
   - If the M-MDS indicates that the temperature is below **60°C {140°F}**, perform the ECT sensor inspection.
10. Set the vehicle on the dynamometer or chassis roller.

Warning

- **When the dynamometer or chassis roller is operating, there is a possibility that the operator may come into contact with or be caught up in the rotating parts, leading to serious injuries or death. When performing work while the dynamometer or chassis roller is operating, be careful not to contact or be caught up in any of the rotating parts.**

11. Drive vehicle at an engine speed to **approx. 2000 rpm** for **30 s or more.**
12. Put a finger to the purge solenoid valve and verify that there is no vacuum applied during Step 2.
    - If there is no vacuum, inspect the following:
      — Wiring harness and connector (Main relay – purge solenoid valve – PCM terminal 2AB)
      — Purge solenoid valve
      — MAF, APP1, APP2, TP_REL and LOAD PIDs
    - If there is vacuum, inspect the following:
      — Vacuum hose (Purge solenoid valve – charcoal canister)

A/C Cut-off Control System Inspection

1. Start the engine.
2. Turn the A/C switch and fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
   - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 s**.
   - If it actuates, inspect as follows:
     — A/C relay
     — Open or short to ground circuit in the wiring harness and connectors (Ignition switch-A/C relay-PCM terminal 1I)
     — A/C related parts
     — APP1, APP2 PIDs

Cooling Fan Control System Inspection

1. Verify that the battery voltage is **more than 12.4 V**.
   - If the battery voltage is **less than 12.4 V**, charge the battery or connect the external power supply.
2. Connect the M-MDS and access ECT PID.
3. Turn A/C switch to off.
4. Verify ECT PID is **less than 98 °C {209 °F}**.
   - If ECT PID **more than 98 °C {209 °F}**, inspect ECT sensor and related wiring harnesses.
5. Verify that the cooling fan does not operate with ECT PID is **less than 98 °C {209 °F}** while the ignition switch is ON.
   - If the cooling fan operates, inspect for following parts and related wiring harnesses:
     — ECT sensor
     — A/C switch
     — A/C refrigerant pressure switch (High/low pressure)
     — A/C refrigerant pressure switch (Medium pressure)
     — VSS
     — A/C magnetic clutch
     — Fan control signal circuit (between fan control module terminal B and PCM terminal 1AE)
       - If the all items are normal, replace fan control module.
6. Verify the cooling fan operates while the A/C switch to ON with the ignition switch at ON position.
   - If the cooling fan does not operate, inspect for following:
     — A/C switch
     — A/C refrigerant pressure switch (High/low pressure)
     — Fan control module power supply circuit
     — Fan control module GND circuit
     — Fan control signal circuit (between fan control module terminal B and PCM terminal 1AE)
       - If the all items are normal, replace fan control module.

7. Verify that the cooling fan operates with following table.

	PCM terminal 1J voltage	
	B+ (off)*	0V (ON)*
Cooling fan speed	Middle speed	High speed

* : A/C refrigerant pressure switch (Medium pressure) condition

- If the cooling fan operation is not specified, inspect for following:
  - — A/C refrigerant pressure switch (Medium pressure)
    - If the A/C refrigerant pressure switch (Medium pressure) is normal, replace fan control module.
8. Turn A/C switch to off.
9. Start the engine and idle it.
10. Verify that the cooling fan operating speed increases relative to ECT PID increases.
    - If the cooling fan speed does not increase inspect following:
      - — ECT sensor (characteristic)
        (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].)
      - — Fan control signal circuit (between fan control module terminal B and PCM terminal 1AE)
        - If the all items are normal, replace fan control module.

Wastegate Control System Operation Inspection
If simulation function of M-MDS is used:

1. Start the engine and run it is idling.
2. Disconnect the hose between the wastegate control solenoid valve and the intake pipe.
3. Put a finger to the wastegate control solenoid valve and verify that there is no pressure applied.
   - If there is pressure, inspect the following:
     - — Wiring harness and connectors (Wastegate control solenoid valve—PCM terminal 2AA)
     - — Wastegate control solenoid valve (Stuck open)
4. Warm up the engine to normal operating temperature.
5. Connect the M-MDS to the DLC-2 and verify that DTC P0245 or P0246 are shown. Perform the DTC inspection.
   (See 01-02B-114 DTC P0245[L3 WITH TC].)
   (See 01-02B-116 DTC P0246[L3 WITH TC].)
6. Select the VGT PID.
7. Increase the duty value of the wastegate control solenoid valve and inspect if the operation sound of the solenoid valve is heard.
   - If the operation sound is heard, inspect for loose or damaged vacuum hoses. (Wastegate actuator - wastegate control solenoid valve - intake hose)
   - If the operation sound is not heard, perform the wastegate control solenoid valve inspection.
8. Warm up the engine to normal operating temperature.
9. Monitor the VGT and APP PIDs using the M-MDS.
10. Run the engine with the APP PID **above 30%** and verify that the VGT PID value increases from **0%**.
    - If the VGT PID is **0%**, inspect the APP PID.

If simulation function of M-MDS is not used:

1. Start the engine and run it is idling.
2. Disconnect the hose between the wastegate control solenoid valve and the intake pipe.
3. Put a finger to the wastegate control solenoid valve and verify that there is no pressure applied.
   - If there is pressure, inspect the following:
     - — Wiring harness and connectors (Wastegate control solenoid valve - PCM terminal 2AA)
     - — Wastegate control solenoid valve (Stuck open)
4. Warm up the engine to normal operating temperature.
5. Connect the M-MDS to the DLC-2 and verify that the DTC P0245 or P0246 are shown. Perform the DTC inspection.
   (See 01-02B-114 DTC P0245[L3 WITH TC].)
   (See 01-02B-116 DTC P0246[L3 WITH TC].)
6. Warm up the engine to normal operating temperature.
7. Monitor the VGT and APP PIDs using the M-MDS.
8. The hose between the wastegate control solenoid valve and intake pipe is disconnected.

9. Run the engine with the APP PID **above 30%** and verify that the VGT PID value increases from **0%** and there is pressure applied.
   - If the VGT PID is **0%**, inspect the TP_REL PID.
   - If there is no pressure applied, inspect for the following:
     — Wastegate control solenoid valve (Stuck closed)
     — Hose connection (Intake hose (turbocharger compressor downstream side) - wastegate actuator - intake hose (turbocharger compressor upstream side))

Variable Valve Timing Control System Operation Inspection
When idling cannot be continued

1. Remove the oil control valve (OCV) and verify that the spool valve is at maximum retard position.
2. Connect the oil control valve (OCV).
3. Turn the ignition switch to the ON position.
4. Verify that the spool valve is at the maximum retard position.
   - If the spool valve is stuck in the advance direction, inspect for the following:
     — Short circuit in wiring harnesses or connectors between the oil control valve (OCV) and the PCM.
5. Inspect the variable timing actuator.

When idling can be continued
If simulation function of M-MDS is used:

1. Warm up the engine to normal operating temperature.
2. Connect the M-MDS to the DLC-2.
3. Start the engine and run it is idling.
4. Select the VT DUTY1 PID.
5. Increase the oil control valve (OCV) duty value and verify that the engine idles roughly or stalls.
   - If as specified, inspect the timing belt component (valve timing deviation).
   - If not as specified, go to the next step.
6. Remove the oil control valve (OCV) while the connector is connected.
7. Turn the ignition switch to the ON position.
8. Select VT DUTY1 PID.
9. Increase the oil control valve (OCV) duty value and verify that the spool valve operates in the advance direction.
   - If as specified, inspect the following hydraulic passage for clogging and/or leakage.
     — Oil pressure switch - oil control valve (OCV)
     — Oil control valve (OCV) - camshaft
     — Camshaft internal passage
   - If not as specified, inspect the following:
     — Oil control valve (OCV) operation
     — Harness and connectors for open or short circuit (Oil control valve (OCV) - PCM terminal 2AF)
10. If they are normal, replace the intake camshaft pulley (with a built-in variable valve timing actuator).

If simulation function of M-MDS is not used:

1. Disconnect the oil control valve (OCV) connector.
2. Warm up the engine and idle it.
3. Apply battery voltage to the oil control valve (OCV) and verify that the engine idles roughly or stalls.
   - If the engine idles roughly or stalls, inspect the timing belt component (valve timing deviation).
   - If the engine does not idle roughly or stalls, go to the next step.
4. Remove the oil control valve (OCV) and perform the spool valve operation inspection.
   - If not as specified, inspect the following:
     — Oil control valve (OCV)
     — Harnesses and connectors between oil control valve (OCV) and PCM have an open or short circuit.
   - If as specified, inspect the following hydraulic passages for clogging or leakage or both:
     — Oil pressure switch – oil control valve (OCV)
     — Oil control valve (OCV) – camshaft
     — Camshaft internal passage
5. If they are normal, replace the camshaft pulley (with built-in variable valve timing actuator).

EVAP system leak inspection using M-MDS

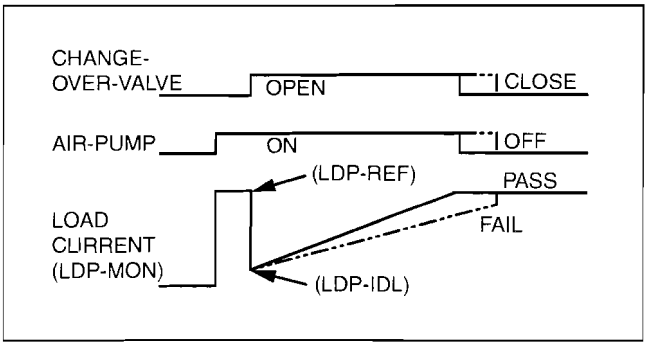
Note

EVAP system test outline

- The EVAP system test, which can substituted for the run drive cycle as an EVAP control system repair confirmation method, can be done while operating the M-MDS in the KOEO (Key On Engine Off) condition instead of actually driving the vehicle.

EVAP system test description

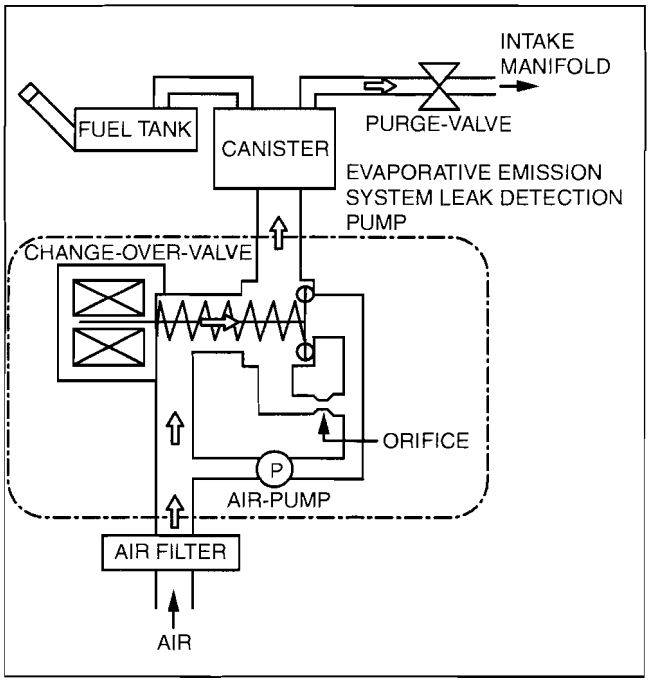
- The EVAP system test finds gas leaks in the system using the PCM to monitor changes in the air pump load current of the EVAP system leak detection pump. This test starts after sending an on-demand test signal from the M-MDS to the PCM. The PCM controls the air pump and change-over-valve operation and also stores the load current of the air pump as follows:
  i. The PCM commands turn the air pump on and retrieve the air pump load current value (LDP_MON PID) as a reference current (LDP_REF PID).
  ii. After retrieving a reference current value, the PCM commands the change-over-valve to open, then captures the air pump load current value (LDP_MON PID) as idle current (LDP_IDL PID). The EVAP system will be pressurized from this phase.
  iii. The PCM continues to monitor the air pump load current value (LDP_MON PID) until the end of the test.
- You can confirm whether any evaporative gas leak occurred or not by reading the test results.



c5u116aw7001

EVAP system malfunction judgment

- The PCM calculates the stored air pump load current value and send the results to the M-MDS as DTCs:



d3u103zw7001

DTC No.	Condition
P0442	Evaporative emission control system leak detected (small leak)
P0446	Change over valve (COV) (EVP system leak detection pump) stuck close
P0455	Evaporative emission control system leak detected (gross leak)
P0456	Evaporative emission system leak detected (very small leak)
P2401	EVAP system leak detection pump motor circuit low
P2402	EVAP system leak detection pump motor circuit high
P2404	EVAP system leak detection pump sense circuit problem
P2405	EVAP system leak detection pump sense circuit low input
P2407	EVAP system leak detection pump sense circuit intermittent

Evaporative system test procedure

1. Select the EVAP system test from the Toolbox on the M-MDS display and follow the instructions.
2. Verify that all of the following PIDs are within the specifications at the pre-test confirmation screen.

Note

- To successfully perform this procedure, all PIDs must be within the following specifications before proceeding to the next step.
- The PCM will cancel the EVAP system test if the VPWR PID value falls lower than **11.0 V** during the test.

Specification

PID	PID Range
BARO	72.2 kPa {543 mmHg, 21.3 inHg} or more
FLI	15—85%
IAT	5—45 °C {41—113 °F}
VPWR	11.0 V or more

3. Start the engine.
4. Drive the vehicle or let the engine idle more than **20 min**.
5. Turn ignition switch off, then turn it to the ON position again (Key On Engine Off).
6. Press the tick icon to start the test.
7. Verify that no DTCs present after the completion of the test.

- If any test result is indicated with red, diagnose the problem using the following DTC troubleshooting procedure or component inspection procedure.
- If any DTCs are detected, diagnose the problem using the appropriate DTC troubleshooting procedure.

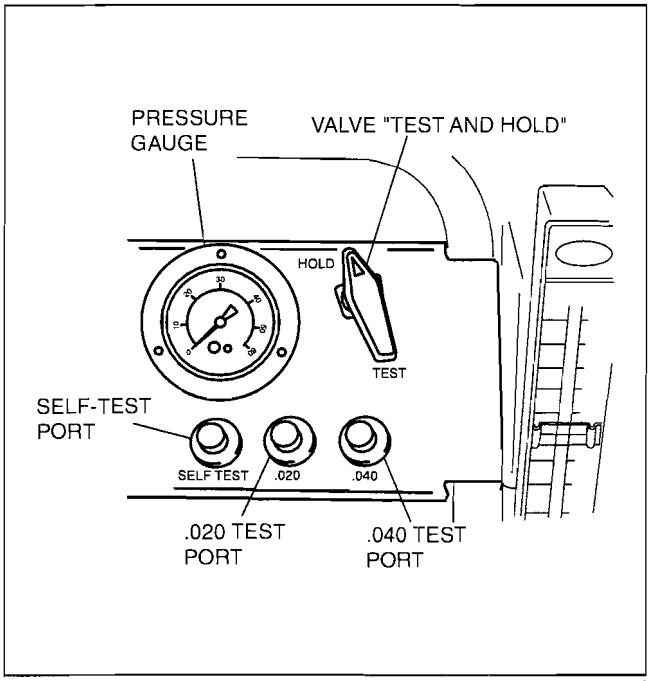
EVAP system leak inspection using leak tester

1. Perform the following **SST** (EVAP System Tester 134-01049) self-test:

Note

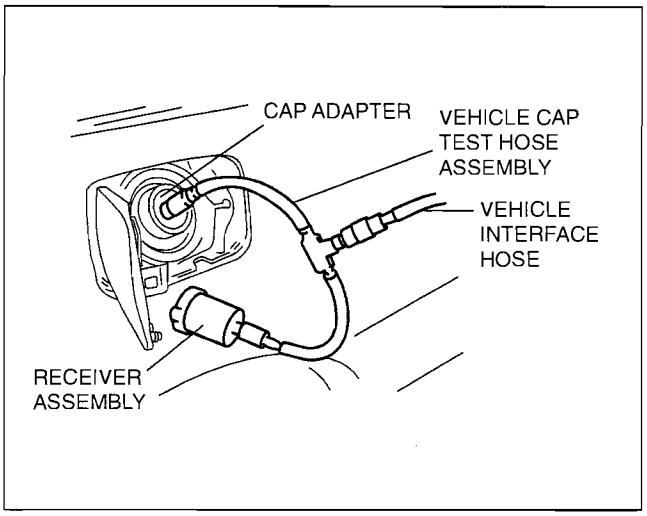
- If the tester does not work correctly during the self-test, refer to the tester operators manual for a more detailed self-test procedure.

(1) Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.
(2) Connect the vehicle interface hose (part of the **SST**) to the SELF-TEST port located on the control panel. Hand tighten the fitting. (Do not overtighten.)
(3) Turn the control valve to the TEST position.
(4) The gauge should read **331—381 mm {13—15 in}** of water.
  - If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.
(5) Turn the control valve to the HOLD position.
(6) Verify that the gauge holds pressure and that the flow meter reads no flow.
  - If there is no drop in pressure and no flow, the tester passes the self-test.
  - If the gauge leaks down, refer to the tester operators manual.



am3uuw0000059

2. Connect the **SST** to the vehicle.
   (1) Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.
   (2) Remove the fuel-filler cap from the vehicle.
   - If the fuel-filler cap is not a MAZDA part or equivalent, replace it.
   (3) Connect the receiver assembly (**SST**: AKS441130) to the vehicle cap test hose assembly (part of the **SST**) and the fuel-filler cap from the vehicle.
   (4) Connect the cap adaptor (**SST**: AKS441131) to the vehicle cap test hose assembly (part of the **SST**) and to the fuel-filler neck.
   (5) Connect the vehicle interface hose (part of the **SST**) to the center fitting of the vehicle cap test hose assembly (part of the **SST**).
3. Connect the M-MDS to the DLC-2.
4. Turn the ignition switch to the ON position (Engine off).
5. Request the PCM on-board device control (Mode 08) using the M-MDS to close the change-over valve (COV) in the EVAP system leak detection pump.



am3uuw0000059

Note
- The COV is closed for **10 min** unless the following any actions are done:
  — The engine is started.
  — The ignition switch is turned off position.

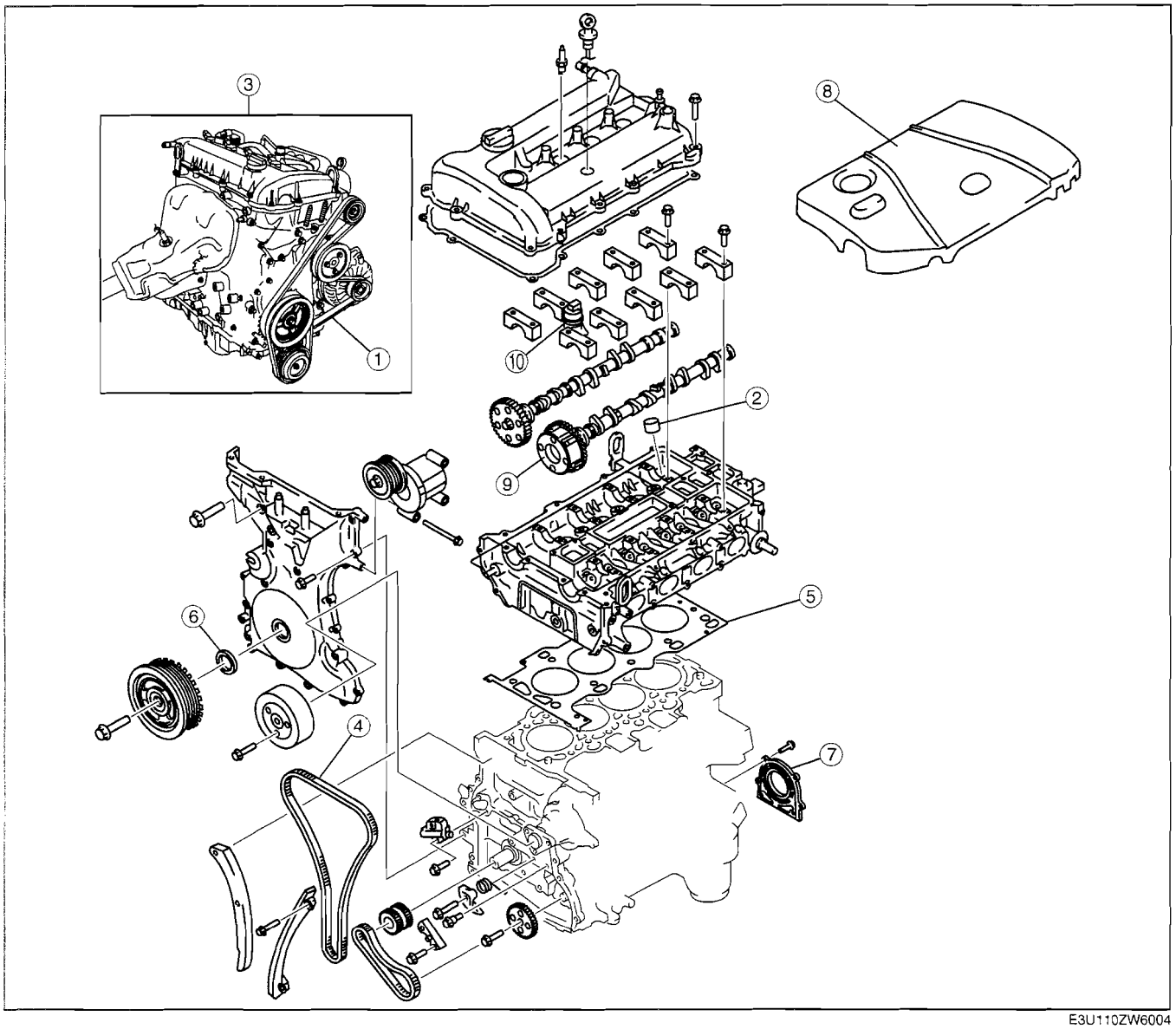
6. Make sure the control valve on the 134-01049 is in the HOLD position and that the valve on the cylinder of nitrogen gas is open.
7. Turn the control valve to the open position and let the system fill. You should note a drop in the gauge pressure along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.
8. If the gauge and the flow meter do not settle to a measurable level after **2—3 min**, then refer to the Mazda Workshop Manual to verify that the cut or vent valve is properly closed.
9. Verify the pressure gauge and flow meter reading to determine if there is an evaporative emissions leak:
   NO EVAPORATIVE LEAK:
   - The flow meter registers "zero flow" and the pressure gauge returns to the pre-set pressure of **356 mm {14 in}** of water (H2O).
   EVAPORATIVE LEAK:
   - The pressure does not return to the preset level of **356 mm {14 in}** of water (H2O) when measuring the flow. See "SETTING LEAK STANDARD FOR TESTING" (.020 to .040 inch H2O) of the Evaporative Emissions Tester operators manual (134-01067).

Note
- Turn the control valve to the HOLD position then disconnect the **SST**.

01-10A MECHANICAL [LF, L3]

ENGINE LOCATION INDEX[LF, L3]

id0110a2802100



E3U110ZW6004

1	Drive belt (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].) (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].) (See 01-10A-6 DRIVE BELT AUTO TENSIONER INSPECTION[LF, L3].)
2	Tappet (See 01-10A-6 VALVE CLEARANCE INSPECTION[LF, L3].) (See 01-10A-7 VALVE CLEARANCE ADJUSTMENT[LF, L3].)
3	Engine (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].) (See 01-10A-28 ENGINE REMOVAL/ INSTALLATION[LF, L3].) (See 01-10A-33 ENGINE DISASSEMBLY/ ASSEMBLY[LF, L3].)
4	Timing chain (See 01-10A-12 TIMING CHAIN REMOVAL/ INSTALLATION[LF, L3].)

5	Cylinder head gasket (See 01-10A-20 CYLINDER HEAD GASKET REPLACEMENT[LF, L3].)
6	Front oil seal (See 01-10A-23 FRONT OIL SEAL REPLACEMENT[LF, L3].)
7	Rear oil seal (See 01-10A-27 REAR OIL SEAL REPLACEMENT[LF, L3].)
8	Plug hole plate (See 01-10A-3 PLUG HOLE PLATE REMOVAL/ INSTALLATION[LF, L3].)
9	Variable valve timing actuator (See 01-10A-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3].) (See 01-10A-34 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[LF, L3].)
10	Oil control valve (OCV) (See 01-10A-35 OIL CONTROL VALVE (OCV) INSPECTION[LF, L3].) (See 01-10A-35 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[LF, L3].)

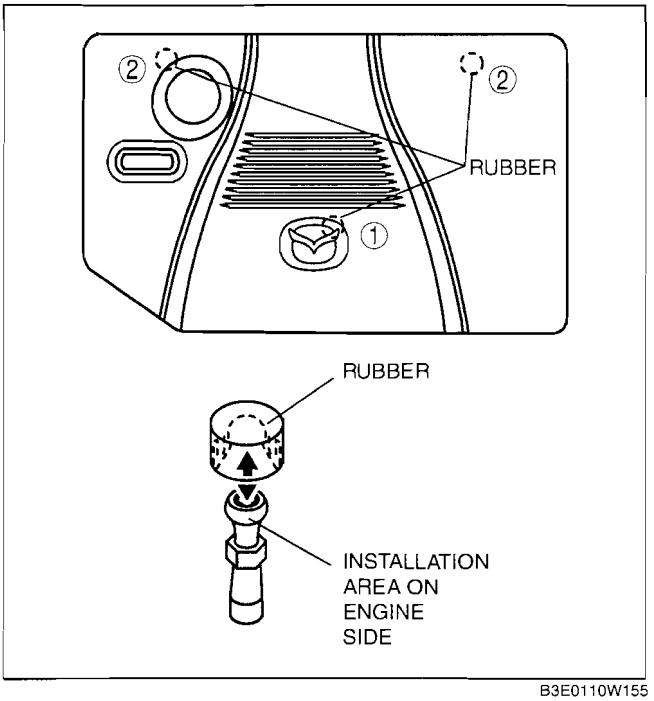
PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3]

id0110a2803900

1. Remove the plug hole plate in the order indicated in the figure.

Note
- Lift off and remove the plug hole plate from the installation areas as shown in the figure.

2. Install the plug hole plate in the reverse order of removal.



B3E0110W155

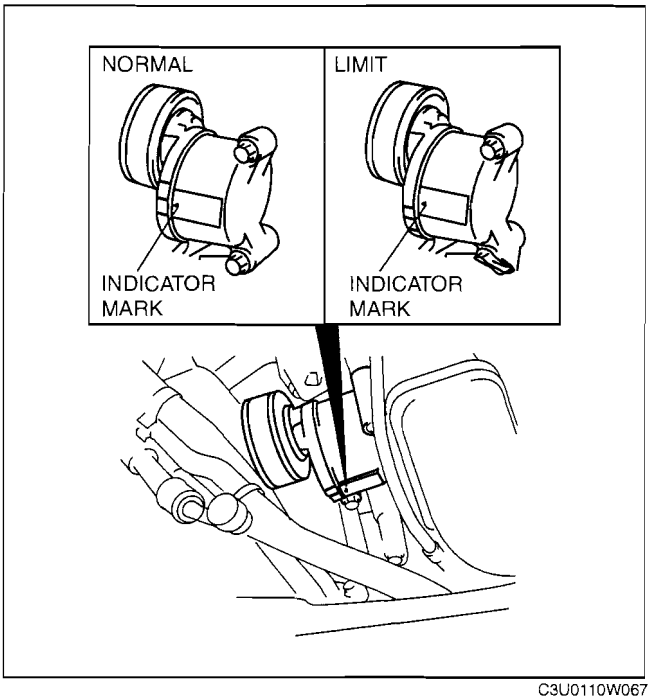
DRIVE BELT INSPECTION[LF, L3]

id0110a2801500

Generator Drive Belt

Note
- Drive belt deflection/tension inspection is not necessary because of the use of the generator drive belt auto tensioner.

1. Verify that the drive belt auto tensioner indicator mark does not exceed the limit.
   - If it exceeds the limit, replace the drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)



C3U0110W067

A/C Drive Belt

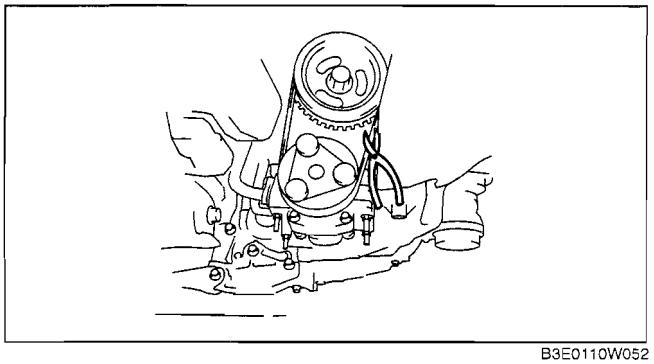
Note
- Drive belt deflection/tension inspection is not necessary because of the use of the maintenance-free type A/C drive belt.
- Replace the drive belt if it is found to be damaged during visual inspection, or if there is a malfunction or noise in the A/C compressor.

DRIVE BELT REPLACEMENT[LF, L3]

id0110a2803800

A/C Drive belt

1. Remove the engine under cover and splash shield (RH).
2. Cut the A/C drive belt using scissors.

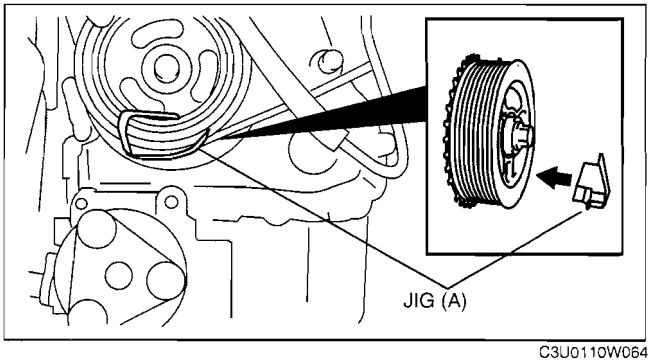


B3E0110W052

3. Install a jig (A) to the crankshaft pulley as shown in the figure.

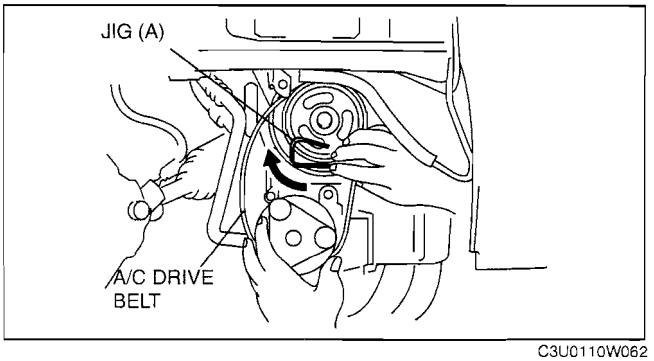
Note

- The jig is prepackaged with a new A/C drive belt.



C3U0110W064

4. Install a new A/C drive belt to the A/C compressor pulley, move jig (A) upward, and then install the A/C drive belt to the crankshaft pulley.

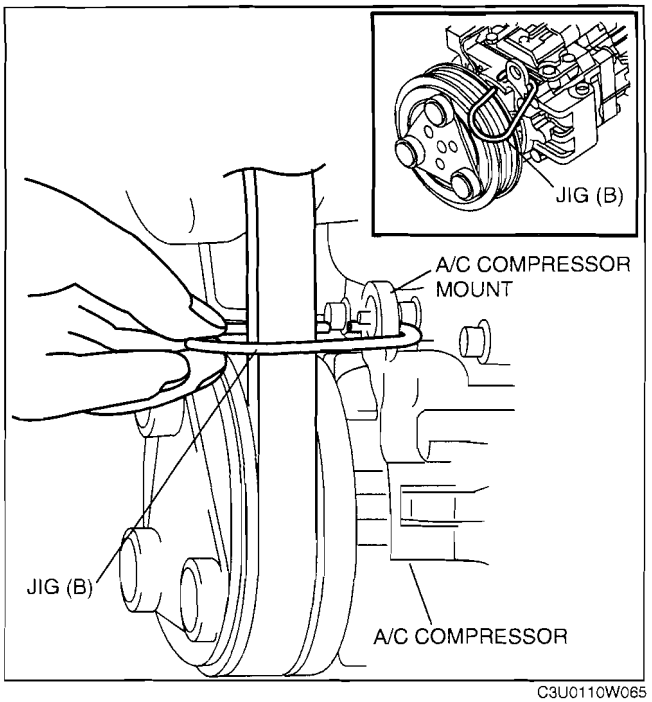


C3U0110W062

5. Install jig (B) to the A/C compressor mount as shown in the figure.

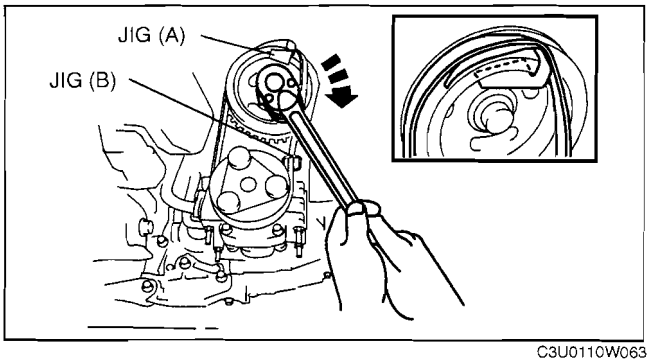
Caution
- **The A/C drive belt cannot be reused.**

Note
- The jig is prepackaged with a new A/C drive belt.
- Do not pass jig (B) through the A/C compressor mount hole.



C3U0110W065

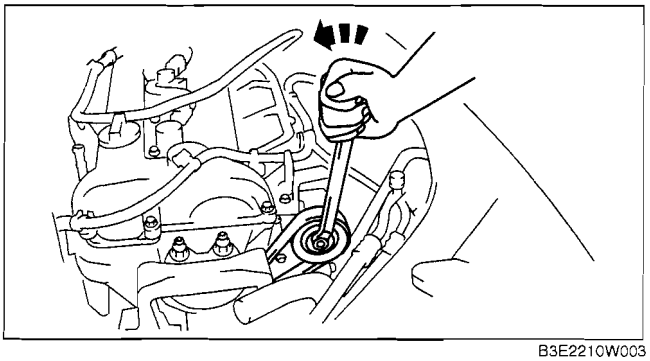
6. Rotate the crankshaft pulley to the right using a wrench and install the A/C drive belt.
7. Install the under cover and splash shield (RH).



C3U0110W063

Generator Drive Belt

1. Remove the plug hole plate.
   (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the A/C drive belt.
3. Turn the center of the auto tensioner pulley counterclockwise to release tension to the drive belt tension.
4. Remove the generator drive belt.
5. Install a new generator drive belt.
6. Install the A/C drive belt.
7. Install the plug hole plate.
   (See 01-10A-3 PLUG HOLE PLATE REMOVAL/ INSTALLATION[LF, L3].)

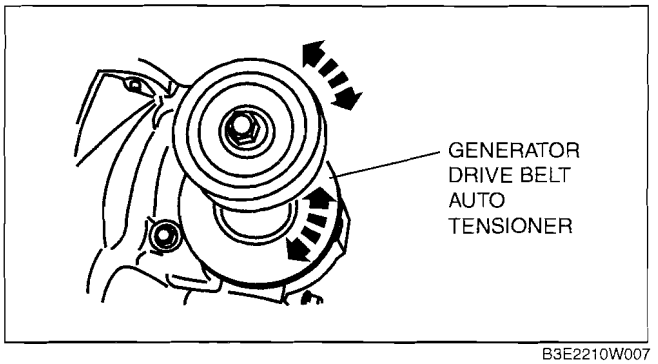


B3E2210W003

DRIVE BELT AUTO TENSIONER INSPECTION[LF, L3]

id0110a2801700

1. Remove the drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
2. Verify that the generator drive belt auto tensioner moves smoothly in the operational direction.
   - If it does not move smoothly, replace the generator drive belt auto tensioner.
3. Turn the generator drive belt auto tensioner pulley by hand and verify that it rotates smoothly.
   - If it does not move smoothly, replace the generator drive belt auto tensioner.
4. Install the generator drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)

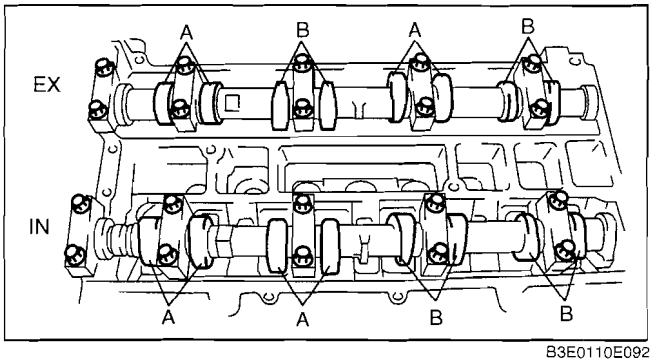


B3E2210W007

VALVE CLEARANCE INSPECTION[LF, L3]

id0110a2803400

1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Disconnect the wiring harness.
5. Remove the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
6. Disconnect the OCV connector.
7. Remove the ventilation hose.
8. Remove the cylinder head cover.
9. Verify that the engine is cold.
10. Measure the valve clearance.
    (1) Turn the crankshaft clockwise so that the No.1 piston is at TDC of the compression stroke.
    (2) Measure the valve clearance at A in the figure.
        - If the valve clearance is out of the standard value, adjust it. (See 01-10A-7 VALVE CLEARANCE ADJUSTMENT[LF, L3].)



B3E0110E092

Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

Note
- Make sure to note down the measured values for choosing the suitable replacement tappets.

    (3) Turn the crankshaft **360°** clockwise so that the No.4 piston is at TDC of the compression stroke.
    (4) Measure the valve clearance at B in the figure.
        - If the valve clearance is out of the standard value, adjust it. (See 01-10A-7 VALVE CLEARANCE ADJUSTMENT[LF, L3].)

Note
- Make sure to note down the measured values for choosing the suitable replacement tappets.

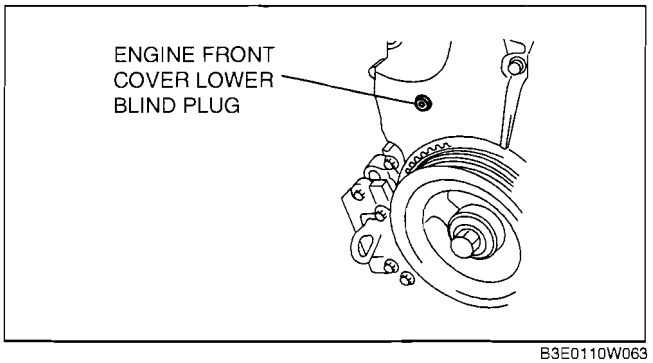
Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

11. Install the cylinder head cover. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
12. Install the ventilation hose.
13. Connect the OCV connector.
14. Install the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
15. Connect the wiring harness.
16. Connect the negative battery cable.
17. Install the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
18. Install the plug hole plate and bracket. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)

VALVE CLEARANCE ADJUSTMENT[LF, L3]

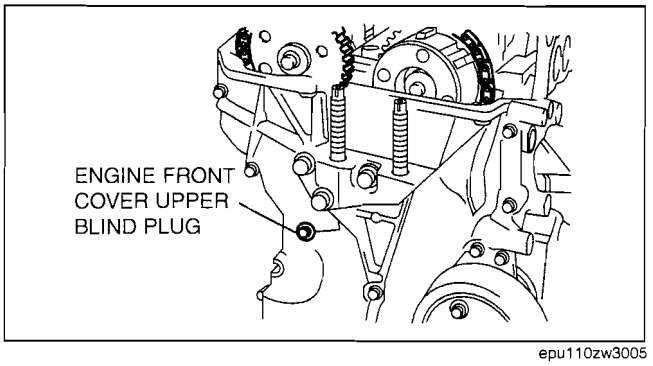
id0110a2803300

1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Disconnect the wiring harness.
5. Disconnect the OCV connector.
6. Remove the following parts.
   (1) Front wheel and tire (RH) (See 02-10-1 GENERAL PROCEDURES (SUSPENSION).)
   (2) Engine under cover and splash shield (RH)
   (3) Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   (4) Ventilation hose
   (5) Cylinder head cover
   (6) Engine front cover lower blind plug



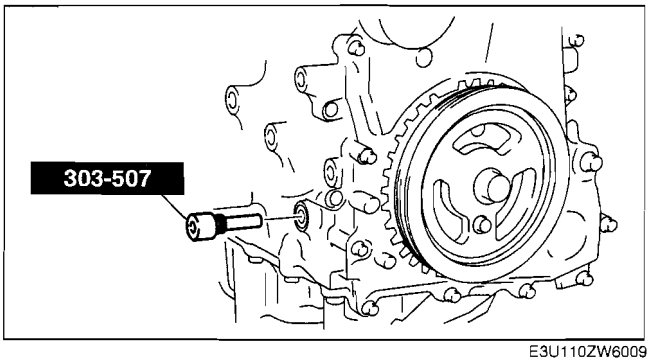
B3E0110W063

   (7) Engine front cover upper blind plug.
   (8) Cylinder block lower blind plug.



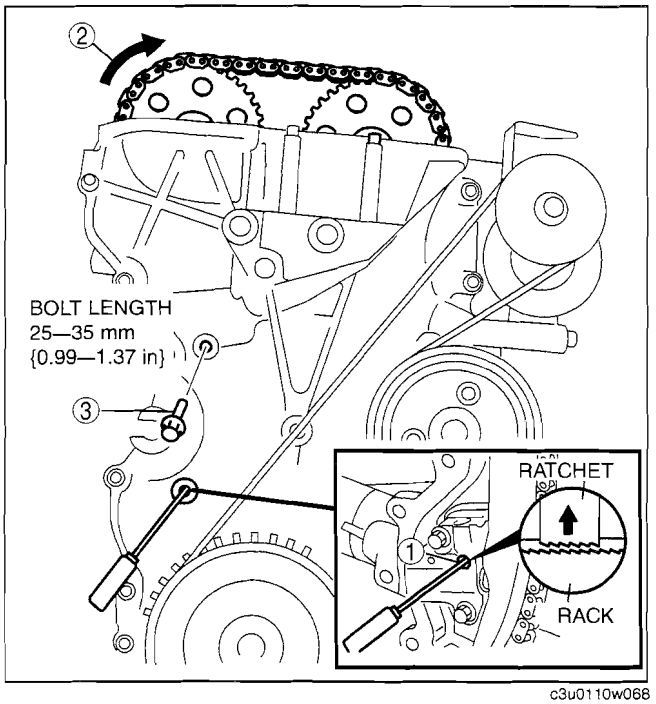
epu110zw3005

7. Install the **SST** as shown in the figure.
8. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



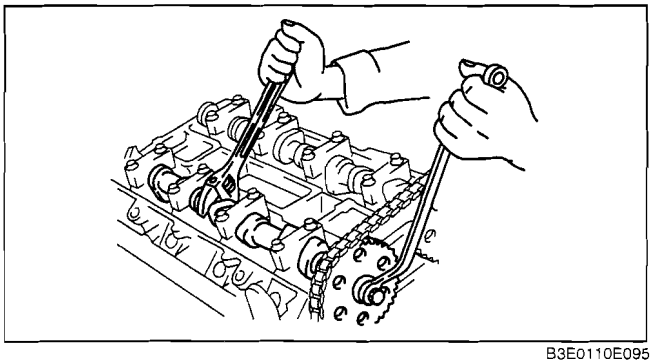
E3U110ZW6009

9. Loosen the timing chain.
   (1) Unlock the chain tensioner ratchet using a suitable screwdriver or equivalent tool.
   (2) Turn the exhaust camshaft clockwise using a suitable wrench on the cast hexagon and loosen the timing chain.
   (3) Placing the suitable bolt **(M6 X 1.0 length 25mm—35mm {0.99—1.37in})** at the engine front cover upper blind plug, secure the chain guide at the position where the tension is released.

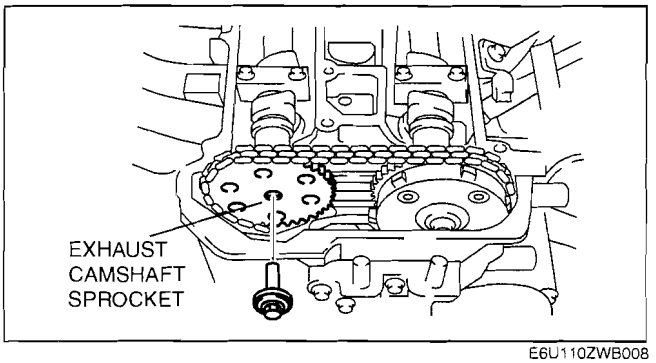


c3u0110w068

10. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown in the figure.


B3E0110E095

11. Remove the exhaust camshaft sprocket.

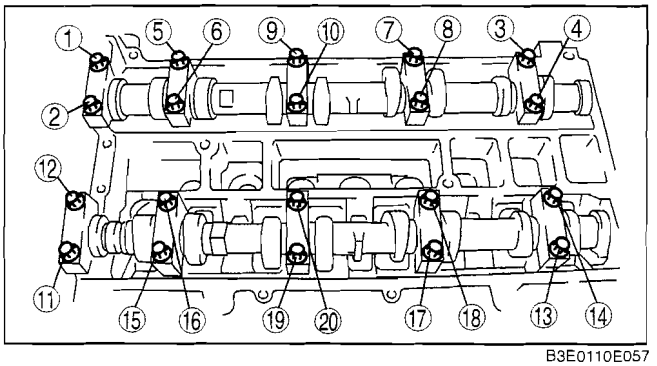


E6U110ZWB008

12. Loosen the camshaft cap bolts in 2—3 passes in the order shown in the figure.

Note
- The cylinder head and the camshaft caps are numbered to be reassembled in their original position correctly. When removed, keep the caps with the cylinder head they were removed from. Do not mix the caps.

13. Remove the camshaft.
14. Remove the tappet.


B3E0110E057

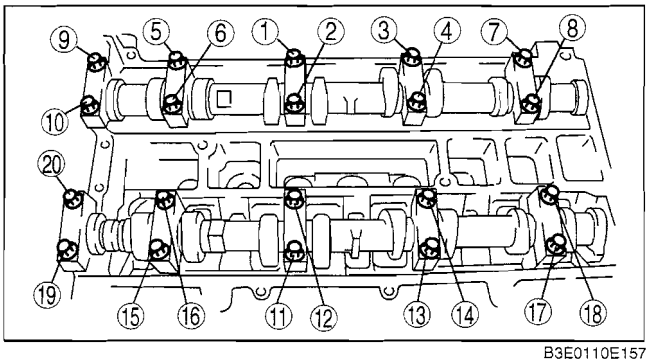
15. Select proper adjustment shim.

New adjustment shim
= Removed shim thickness + Measured valve clearance - Standard valve clearance (IN: 0.25 mm {0.0098 in}, EX: 0.30 mm {0.0118 in})

Standard [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.0110 in}
EX: 0.27—0.33 mm {0.0107—0.0129 in}

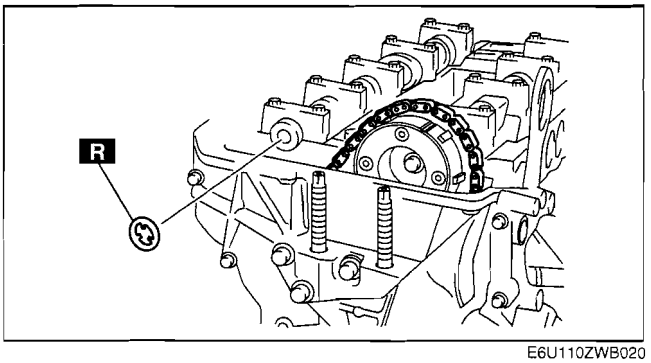
16. Install the camshaft with No.1 cylinder aligned with the TDC position.
17. Tighten the camshaft cap bolts in the order shown with the following two steps.

Tightening torque
(1) 5.0—8.0 N·m
{51.0—81.5 kgf·cm, 44.3—70.8 in·lbf}
(2) 14—17 N·m
{1.43—1.73 kgf·m, 10.4—12.5 ft·lbf}



B3E0110E157

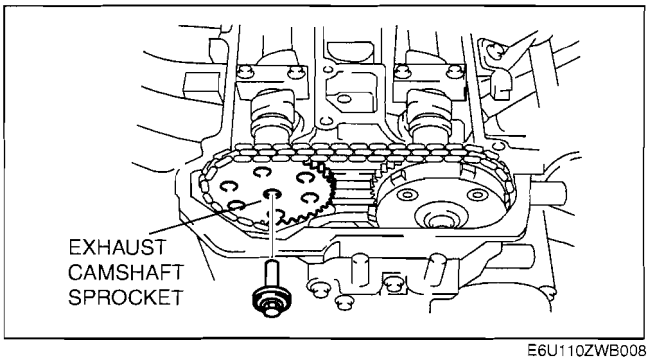
18. Install a new washer.



E6U110ZWB020

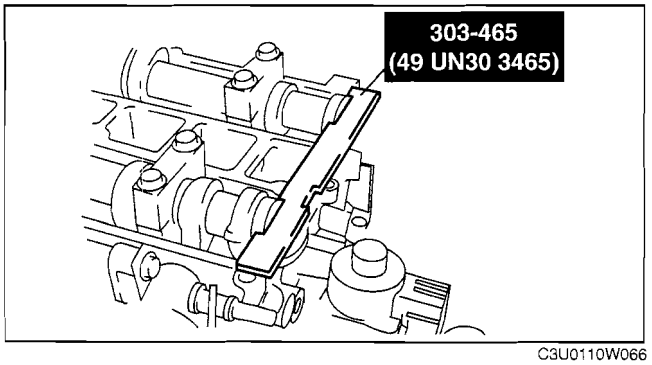
19. Install the exhaust camshaft sprocket.

Note
- Do not tighten the bolt for the camshaft sprocket during this step. First confirm the valve timing, then tighten the bolt.



E6U110ZWB008

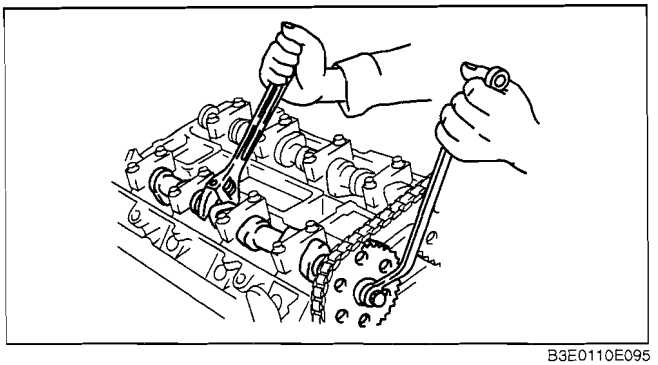
20. Install the **SST** to the camshaft as shown in the figure.
21. Remove the **(M6 X 1.0 length 25mm—35mm {0.99—1.37in})** bolt from the engine front cover to apply tension to the timing chain.
22. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



C3U0110W066

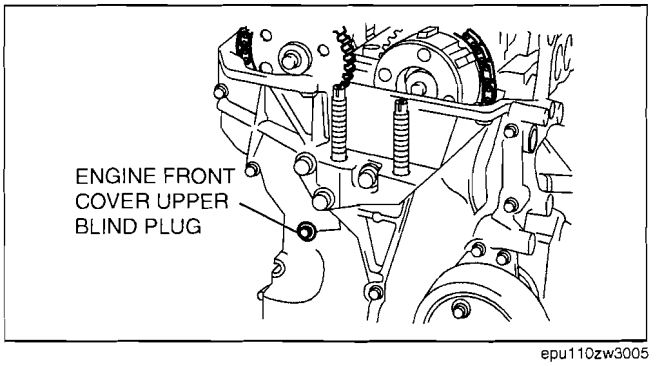
23. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown in the figure.
24. Tighten the exhaust camshaft sprocket lock bolt.

    Tightening torque
    69—75 N·m
    {7.1—7.6 kgf·m, 50.9—55.3 ft·lbf}


B3E0110E095

25. Remove the **SST** from the camshaft.
26. Remove the **SST** from the block lower blind plug.
27. Rotate the crankshaft clockwise two turns until the TDC position.
    - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 14.
28. Apply silicone sealant to the engine front cover upper blind plug.
29. Install the following parts.
    (1) Engine front cover upper blind plug.

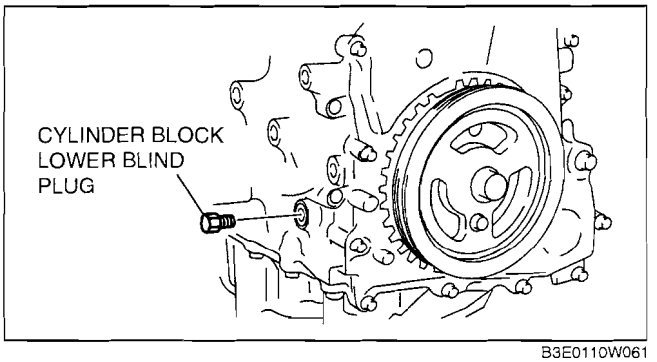
    Tightening torque
    8.0—11.5 N·m
    {82—117 kgf·cm, 71—101 in·lbf}



epu110zw3005

    (2) Cylinder block lower blind plug.

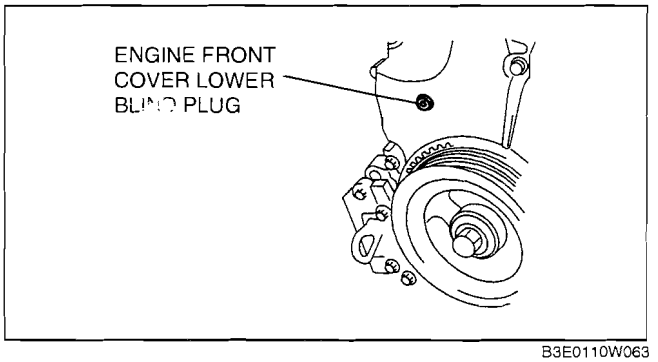
    Tightening torque
    18—22 N·m
    {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



B3E0110W061

    (3) New engine front cover lower blind plug.

    Tightening torque
    10—14 N·m
    {102—142 kgf·m, 89—123 in·lbf}



B3E0110W063

    (4) Cylinder head cover. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
    (5) Ventilation hose.
    (6) Ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
    (7) Engine under cover and splash shield (RH).
    (8) Front wheel and tire (RH). (See 02-10-1 GENERAL PROCEDURES (SUSPENSION).)
30. Connect the OCV connector.
31. Connect the wiring harness.
32. Connect the negative battery cable.
33. Install the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
34. Install the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)

COMPRESSION INSPECTION[LF, L3]

id0110a2800300

Warning
- **Hot engines and oil can cause severe burns. Be careful not to burn yourself during removal/ installation of each component.**

1. Verify that the battery is fully charged.
   - Recharge it if necessary. (See 01-17A-4 BATTERY INSPECTION[LF, L3].)
2. Warm up the engine to the normal operating temperature.
3. Stop the engine and allow it to cool down for **about 10 min**.
4. Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)**

5. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
6. Remove the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
7. Remove the spark plugs. (See 01-18A-3 SPARK PLUG REMOVAL/INSTALLATION[LF, L3].)
8. Connect a compression gauge into the spark plug hole.
9. Fully depress the accelerator pedal and crank the engine.
10. Note down the maximum gauge reading.
11. Inspect each cylinder as above.
    - If the measured value is less than the limited value, or there is a cylinder whose compression value varies from that of other cylinders by **196.1 kPa {2.0 kgf/cm2, 28.5 psi}** or more, add a small amount of engine oil through the spark plug hole. Then measure the compression pressure and perform the respective operations for the following cases.
      — If the compression increases, the piston, the piston rings, or cylinder wall may be worn and overhaul is required.
      — If the compression stays low, a valve may be stuck or improperly seated and overhaul is required.
      — If the compression in adjacent cylinders stays low, the cylinder head gasket may be damaged or the cylinder head distorted and overhaul is required.

Compression [LF]

Standard: 1,400 kPa {14.28 kgf/cm^2, 203.1 psi} [300 rpm]
Minimum: 980 kPa {10.0 kgf/cm^2, 142.2 psi} [300 rpm]
Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm^2, 28.5 psi}

Compression [L3]

Standard: 1,372 kPa {14.00 kgf/cm^2, 199.1 psi} [290 rpm]
Minimum: 960 kPa {9.79 kgf/cm^2, 139.2 psi} [290 rpm]
Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm^2, 28.5 psi}

12. Disconnect the compression gauge.
13. Install the following parts.
    (1) Spark plug. (See 01-18A-3 SPARK PLUG REMOVAL/INSTALLATION[LF, L3].)
    (2) Ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
    (3) Fuel pump relay. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
    (4) Plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)

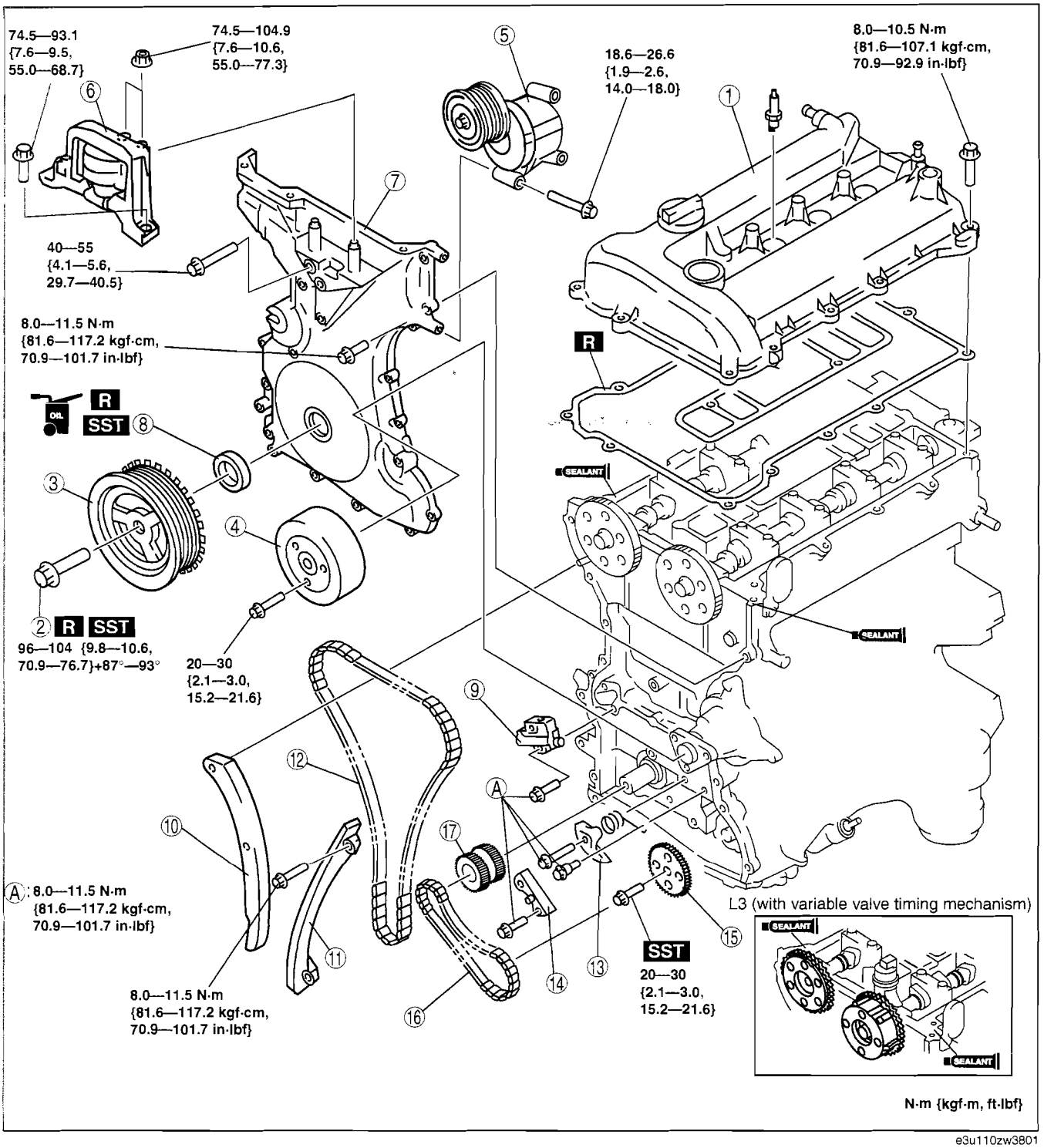
TIMING CHAIN REMOVAL/INSTALLATION[LF, L3]

id0110a2801000

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)**

1. Remove the following parts.
   (1) Plug hole plate (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
   (2) Plug hole plate bracket
   (3) Accelerator cable and bracket
   (4) Battery cover (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the following parts.
   (1) Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   (2) Front wheel and tire (RH) (See 02-10-1 GENERAL PROCEDURES (SUSPENSION).)
   (3) Under cover and splash shields
   (4) Crankshaft position (CKP) sensor (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
   (5) Drive belt (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
   (6) A/C compressor with the oil hose still connected and position the A/C compressor so that it is out of the way (See 07-11-15 A/C COMPRESSOR REMOVAL/INSTALLATION[LF, L3].)
   (7) Coolant reserve tank with the hose still connected and position the coolant reserve tank so that it is out of the way
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Start the engine.
7. Inspect the following and adjust if necessary.
   - Pulley and belt for runout and contact
   - Leakage of engine oil
   - Ignition timing, idle speed, and amount of CO and HC (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
   - Engine-driven accessories operation



e3u110zw3801

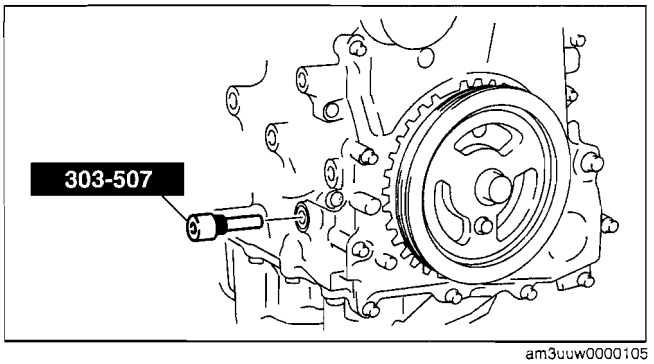
1	Dipstick
2	Cylinder head cover (See 01-10A-20 Cylinder Head Cover Installation Note.)
3	Crankshaft pulley lock bolt (See 01-10A-14 Crankshaft Pulley Lock Bolt Removal Note.) (See 01-10A-19 Crankshaft Pulley Lock Bolt Installation Note.)
4	Crankshaft pulley
5	Water pump pulley
6	Drive belt auto tensioner

7	No.3 engine mount rubber and No.3 engine joint bracket (See 01-10A-14 No.3 Engine Mount Rubber Removal Note.) (See 01-10A-18 No.3 Engine Mount Rubber and No.3 Engine Mount Bracket Installation Note.)
8	Engine front cover (See 01-10A-17 Engine Front Cover Installation Note.)
9	Front oil seal (See 01-10A-18 Front Oil Seal Installation Note.)

10	Chain tensioner (See 01-10A-16 Chain Tensioner Removal Note.)
11	Tensioner arm
12	Chain guide
13	Timing chain (See 01-10A-17 Timing Chain Installation Note.)
14	Oil pump chain tensioner
15	Oil pump chain guide
16	Oil pump sprocket (See 01-10A-16 Oil Pump Sprocket Removal Note.) (See 01-10A-16 Oil Pump Sprocket Installation Note.)
17	Oil pump chain
18	Crankshaft sprocket

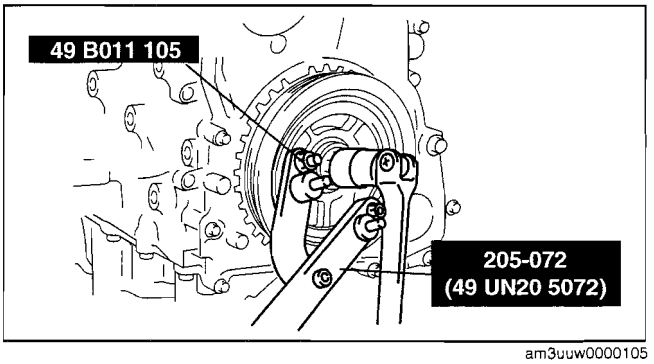
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. install the **SST**.
3. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



am3uuw0000105

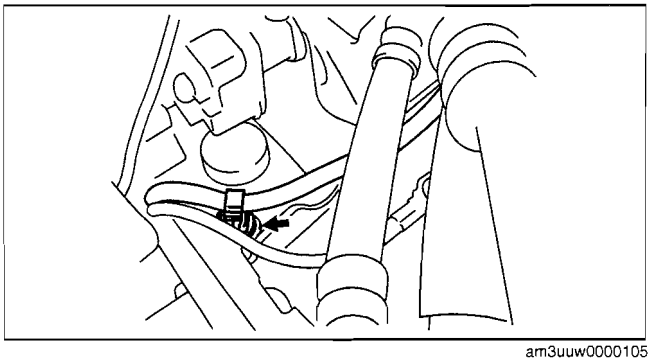
4. Hold the crankshaft pulley using the **SSTs**.



am3uuw0000105

No.3 Engine Mount Rubber Removal Note

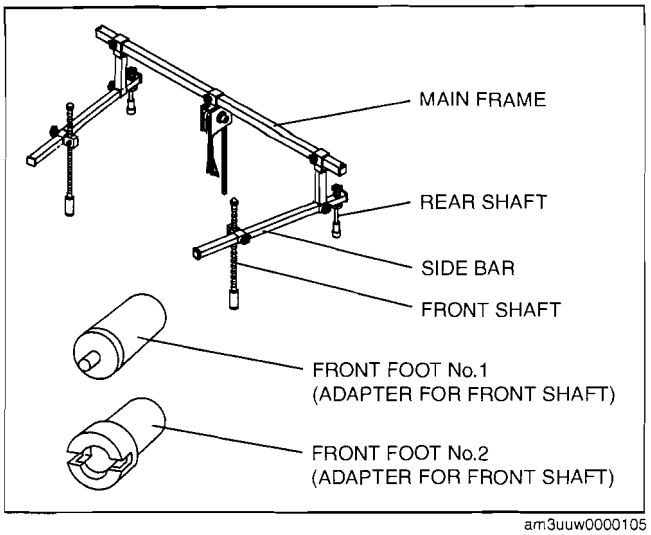
1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown the figure.



am3uuw0000105

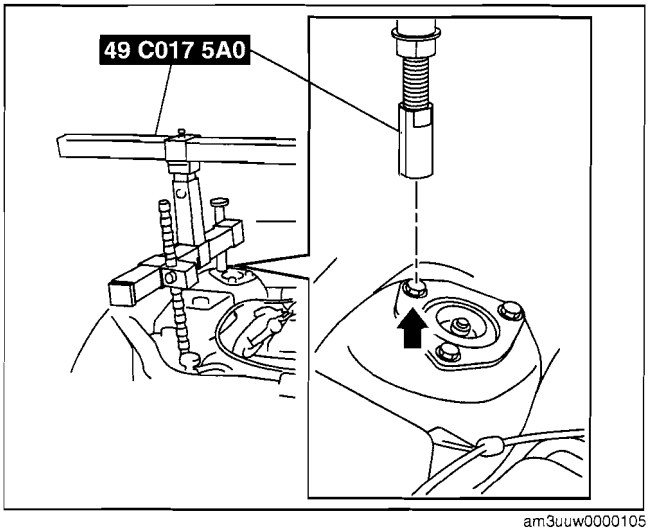
2. Install the **SST** using the following procedure.

Caution
- **Refer to the SST instruction manual for the basic handing procedure.**



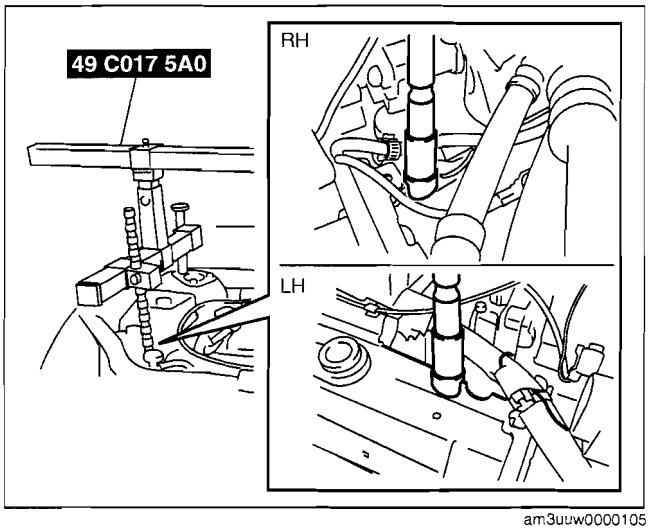
am3uuw0000105

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber. (identical position to the right side)



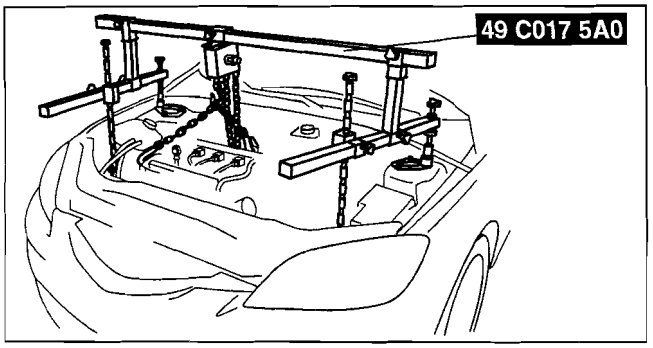
am3uuw0000105

(3) Install front foot No.2 to the left/right front shaft of the SST, then align the groove of the front shaft of the SST with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3uuw0000105

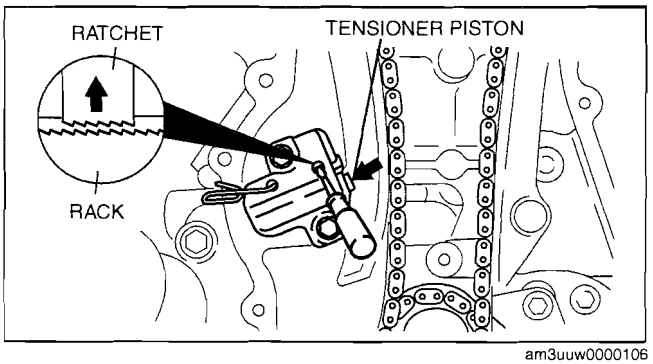
3. Suspend the engine using the **SST**.



am3uuw0000106

Chain Tensioner Removal Note

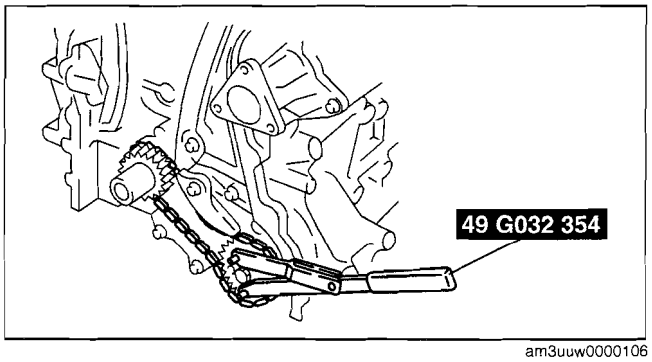
1. Unlock the chain tensioner ratchet using a suitable screw driver or equivalent tool.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a **1.5 mm {0.059 in}** wire or paper clip.



am3uuw0000106

Oil Pump Sprocket Removal Note

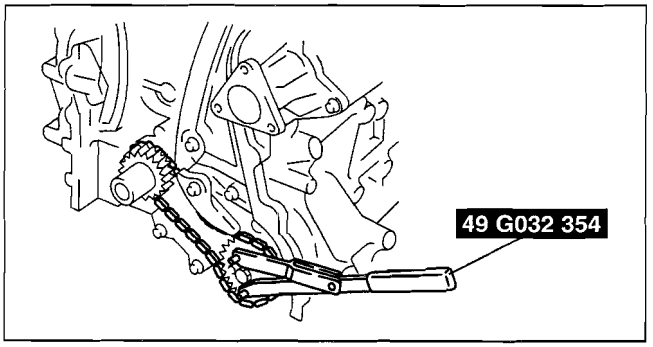
1. Hold the oil pump sprocket using the **SST**.



am3uuw0000106

Oil Pump Sprocket Installation Note

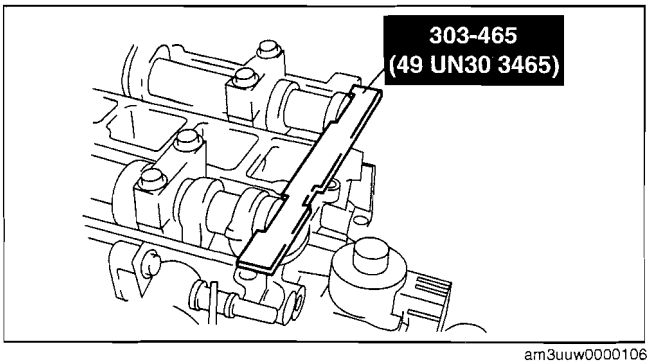
1. Hold the oil pump sprocket using the **SST**.



am3uuw0000106

Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown in the figure.
2. Install the timing chain.
3. Remove the retaining wire or paper clip from the auto tensioner to apply tension to the timing chain.



am3uuw0000106

Engine Front Cover Installation Note

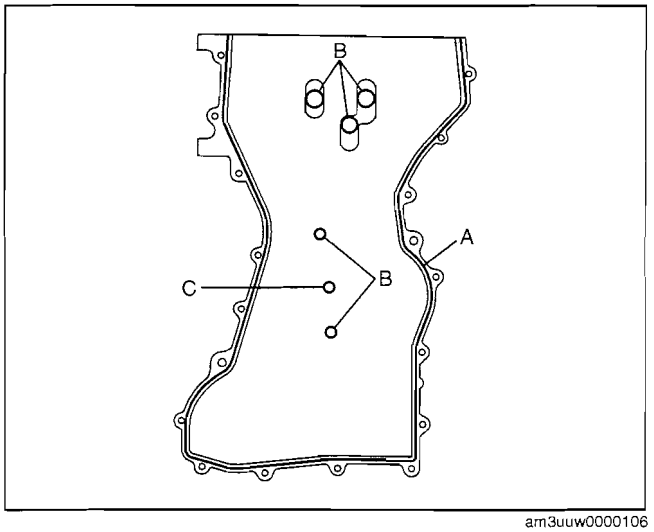
1. Apply silicone sealant to the engine front cover as shown in the figure.

Caution

- **Install the engine front cover within 10 min of applying the silicone sealant.**
- **Silicone sealant is not need in area C as indicated below due to an existing.**
- **They are oil and a thing without adhesion of dust to a seal side.**

Thickness

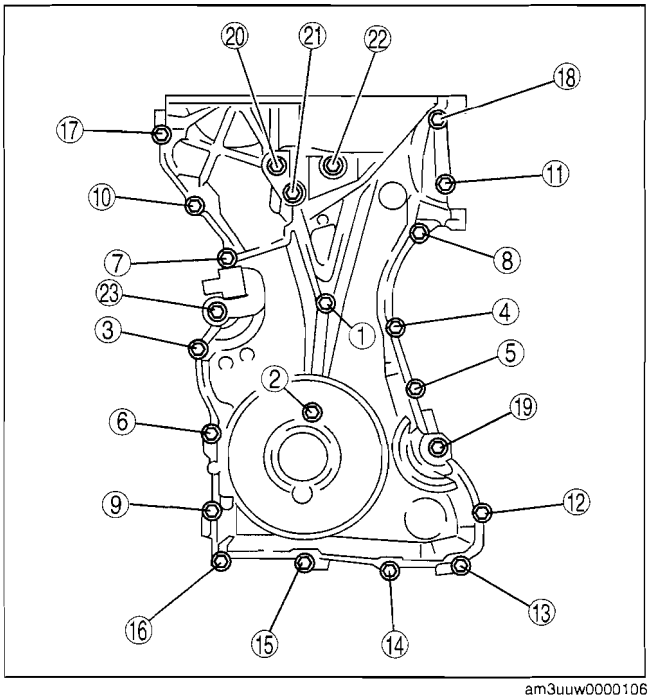
A: 2.2—3.2 mm {0.087—0.125 in}
B: 1.5—2.5 mm {0.059—0.098 in}



am3uuw0000106

2. Install the engine front cover bolts in the order shown in the figure.

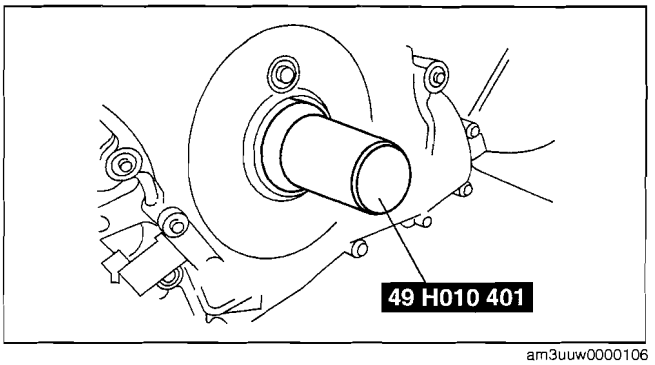
Bolt No.	Tightening torque
1—18	**8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}**
19—22	**40—55 N·m {4.1—5.6 kgf·m, 29.7—40.5 ft·lbf}**
23	**20—30 N·m {2.1—3.0 kgf·m, 14.8—22.1 ft·lbf}**



am3uuw0000106

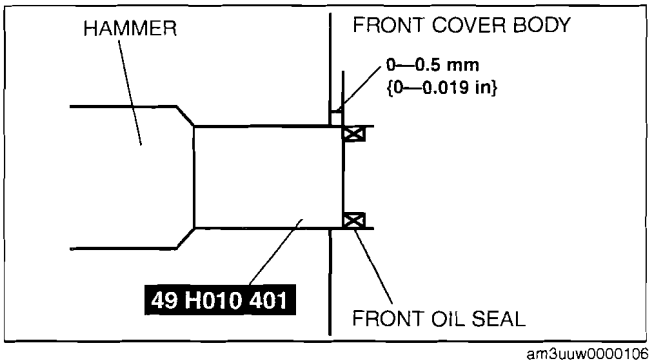
Front Oil Seal Installation Note

1. Apply clean engine oil to the oil seal.
2. Push the oil seal slightly in by hand.
3. Compress the oil seal using the **SST** and a hammer.



am3uuw0000106

Front oil seal press-in amount
0—0.5 mm {0—0.019 in}



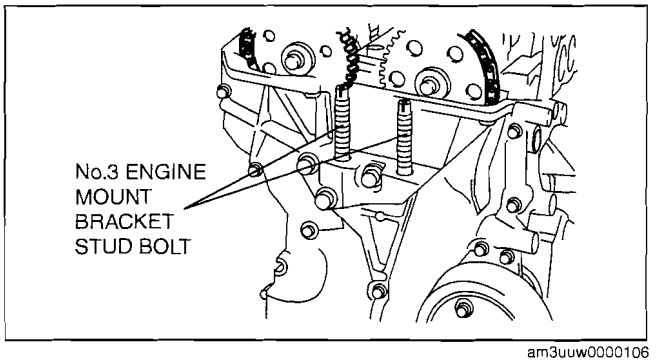
am3uuw0000106

No.3 Engine Mount Rubber and No.3 Engine Mount Bracket Installation Note

1. Tighten the stud bolt of the No.3 engine mount bracket.

Tightening torque
7.0—13 N·m
{71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}

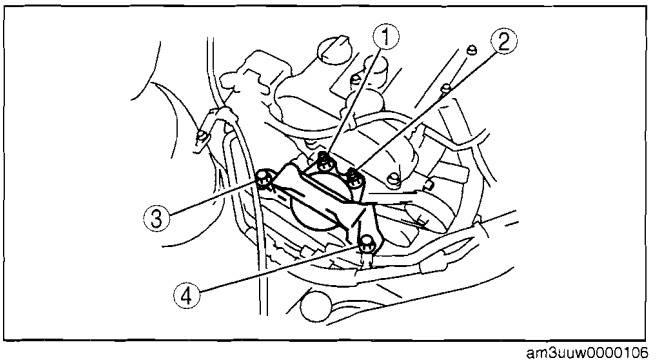
Note
- Tightening stud bolt when the nut of No.3 engine mount nut is loosened.



am3uuw0000106

2. Hand-tighten the No.3 engine mount rubber and No.3 engine mount bracket.
3. Tighten the bolts and nuts in the order as shown in the figure.

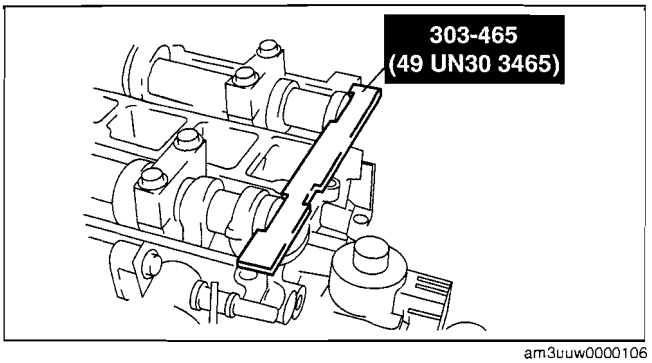
Tightening torque
Nuts : 74.5—104.9 N·m {7.6—10.6 kgf·m, 55.0—77.3 ft·lbf}
Bolts : 74.5—93.1 N·m {7.6—9.5 kgf·m, 55.0—68.7 ft·lbf}



am3uuw0000106

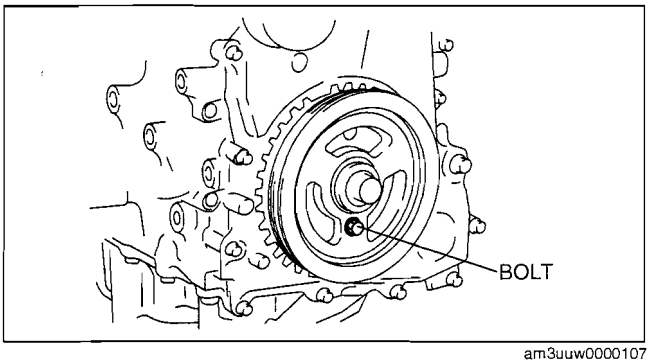
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown in the figure.



am3uuw0000106

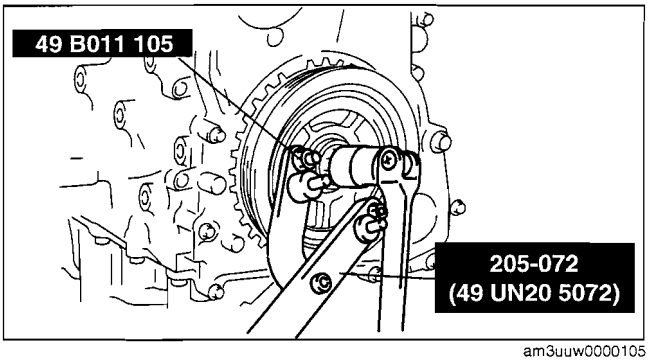
2. Install the **M6 x 1.0** bolt in by hand.
3. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



am3uuw0000107

4. Hold the crankshaft pulley using the **SST**.
5. Tighten the crankshaft pulley lock bolt in the order shown with the following two steps using the **SST** (49 D032 316).

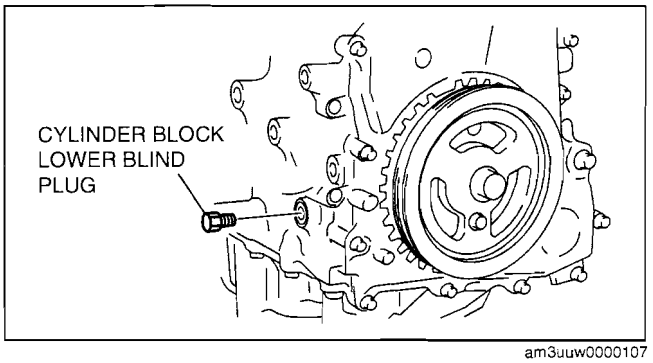
   Tightening torque
   (1) 96—104 N·m
   {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}
   (2) 87°—93°



am3uuw0000105

6. Remove the **M6 x 1.0** bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Rotate the crankshaft clockwise two turns until the TDC position.
   - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.

    Tightening torque
    18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



am3uuw0000107

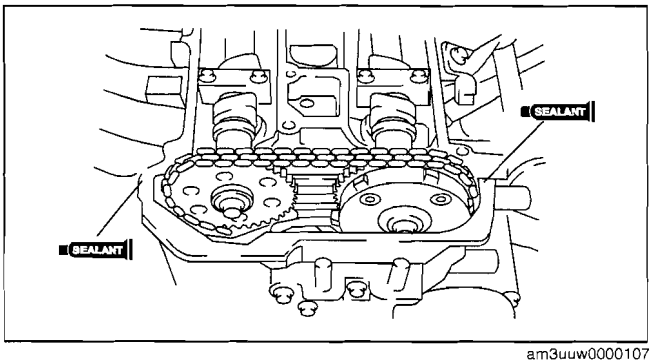
Cylinder Head Cover Installation Note

1. Apply silicone sealant to the mating faces as shown in the figure.

   Caution
   - **Install the cylinder head cover within 10 min of applying the silicone sealant.**

   Thickness
   4.0—7.0 mm {0.16—0.24 in}

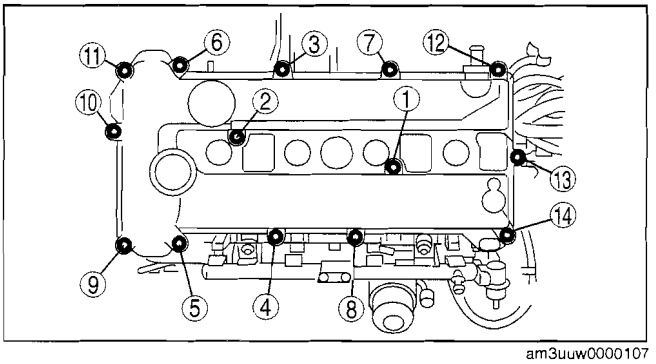
2. install the cylinder head cover with a new gasket.



am3uuw0000107

3. Tighten the bolts in the order shown in the figure.

   Tightening torque
   8.0—10.5 N·m
   {81.6—107.1 kgf·cm, 70.9—92.9 in·lbf}



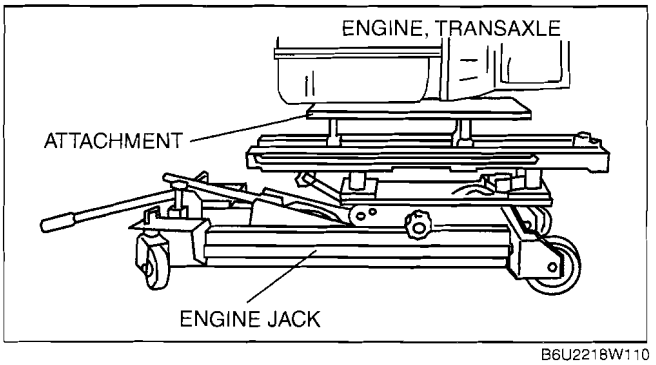
am3uuw0000107

CYLINDER HEAD GASKET REPLACEMENT[LF, L3]

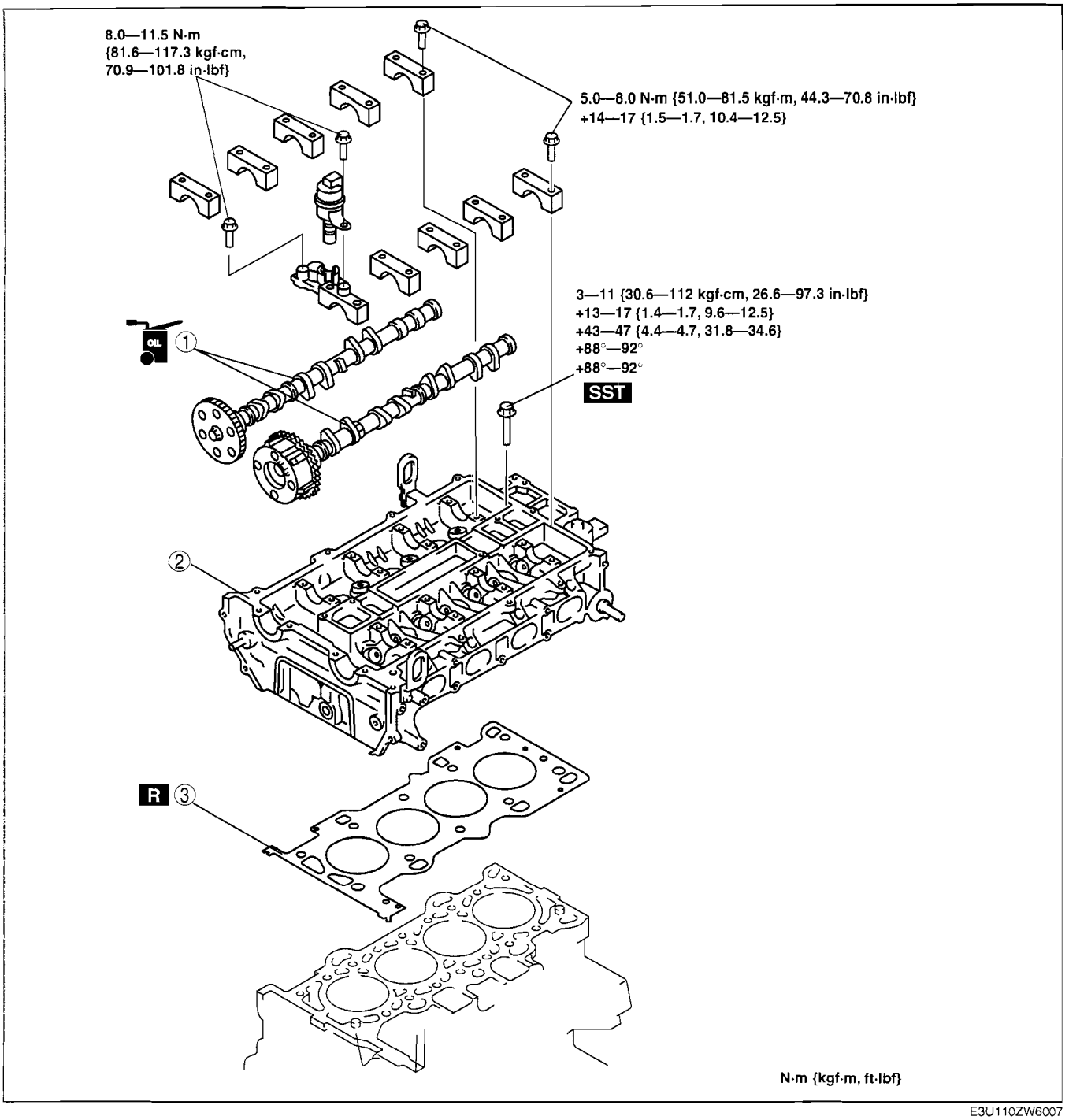
id0110a2800700

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)**

1. Remove the timing chain. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
2. Remove the intake manifold. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].) (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the following parts.
   (1) WU-TWC (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (2) Radiator upper hose
   (3) Water hose
   (4) Heater hose
   (5) wiring harness
4. To firmly support the engine, first set the engine jack and attachment to the oil pan.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Inspect the compression. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)



B6U2218W110



E3U110ZW6007

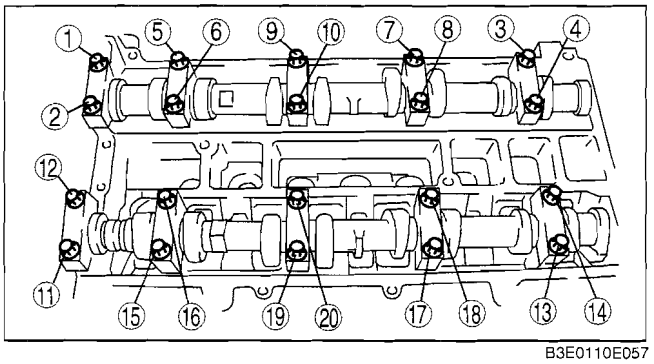
1	Camshaft (See 01-10A-22 Camshaft Removal Note.) (See 01-10A-23 Camshaft Installation Note.)

2	Cylinder head (See 01-10A-22 Cylinder Head Removal Note.) (See 01-10A-22 Cylinder Head Installation Note.)
3	Cylinder head gasket
4	Oil control valve (OCV)

Camshaft Removal Note

Note
- The cylinder head and the camshaft caps are numbered to be reassembled in their original position correctly. When removed, keep the caps with the cylinder head they were removed from. Do not mix the caps.

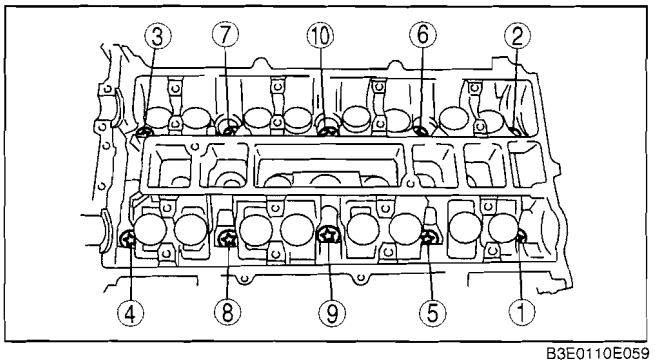
1. Loosen the camshaft cap bolts in 2—3 passes in the order shown in the figure.



B3E0110E057

Cylinder Head Removal Note

1. Loosen the cylinder head bolts in 2—3 passes in the order shown in the figure.



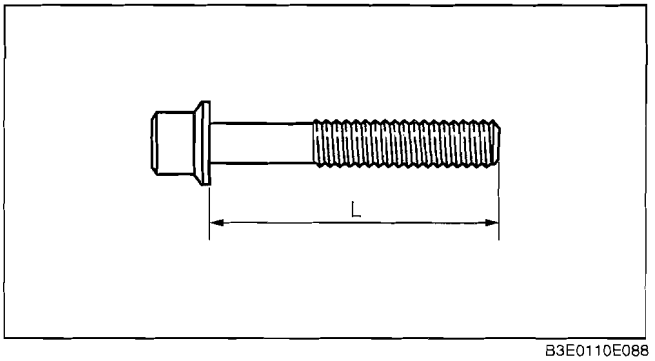
B3E0110E059

Cylinder Head Installation Note

1. Measure the length of each cylinder head bolt.
   - Replace any that exceeds maximum length.

   Cylinder Head Bolt Length L
   145.2—145.8 mm {5.717—5.740 in}

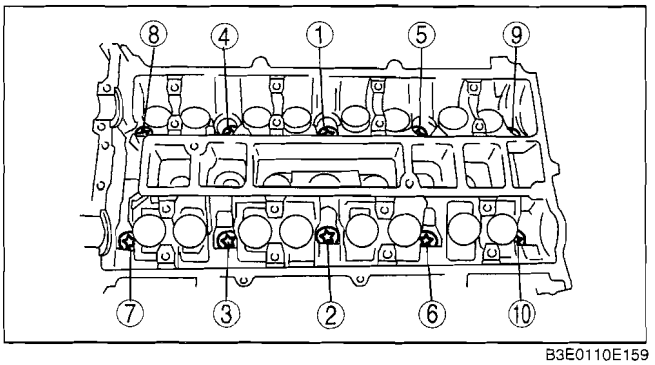
   Cylinder Head Bolt Maximum
   146.5 mm {5.767 in}



B3E0110E088

2. Tighten the cylinder head bolts in the order shown with the following 5 steps using the **SST (49 D032 316)**.

   Tightening torque
   (1) 3—11 N·m
   {30.6—112 kgf·cm, 26.6—97.3 in·lbf}
   (2) 13—17 N·m
   {1.4—1.7 kgf·m, 9.59—12.5 ft·lbf}
   (3) 43—47 N·m
   {4.4—4.7 kgf·m, 31.8—34.6 ft·lbf}
   (4) 88°—92°
   (5) 88°—92°

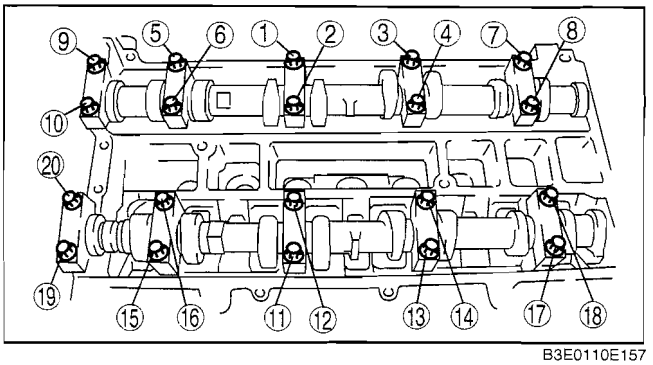


B3E0110E159

Camshaft Installation Note

1. Set the cam position of No.1 cylinder at the top dead center (TDC) and install the camshaft.
2. Temporarily tighten the camshaft bearing caps evenly in 2—3 passes.
3. Tighten the camshaft cap bolts in the order shown with the following two steps.

Tighten torque
(1) 5.0—8.0 N·m
{51.0—81.5 kgf·cm, 44.3—70.8 in·lbf}
(2) 14—17 N·m
{1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}



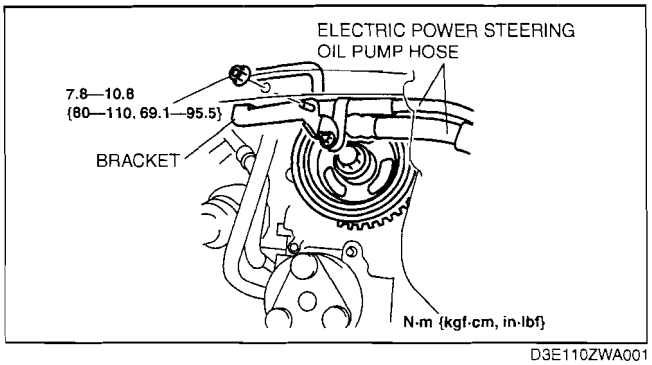
B3E0110E157

FRONT OIL SEAL REPLACEMENT[LF, L3]

id0110a2800800

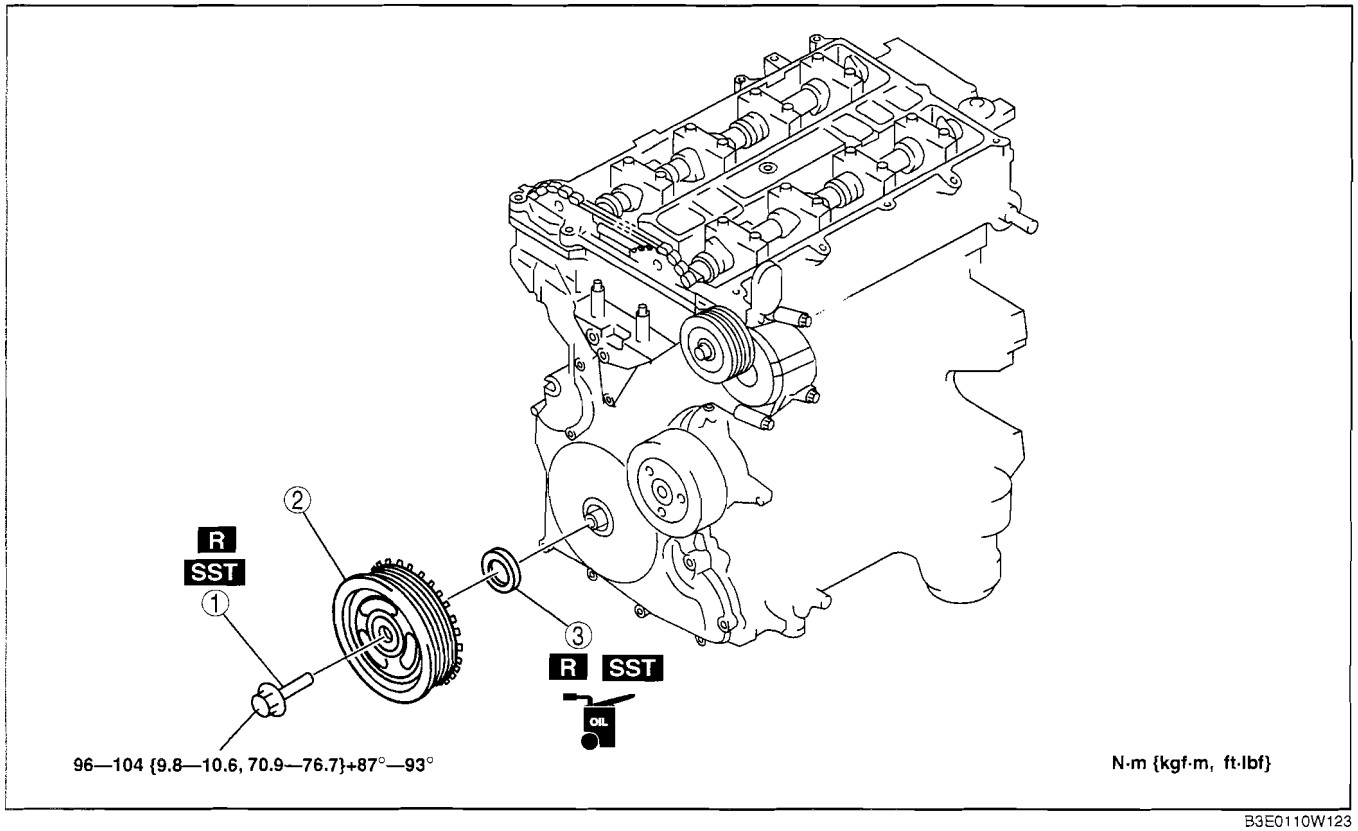
1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the plug hole plate bracket.
3. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the negative battery cable.
5. Disconnect the wiring harness.
6. Remove the following parts.
   (1) Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   (2) Cylinder head cover (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
   (3) Drive belt (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
   (4) Front wheel and tire (RH) (See 02-10-1 GENERAL PROCEDURES (SUSPENSION).)
   (5) Under cover and splash shield
   (6) Crankshaft position (CKP) sensor (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].)

7. Remove the bracket installation nut shown in the figure, then set the bracket and electric power steering oil pump hose away from the vehicle.
8. Remove in the order indicated in the table.



D3E110ZWA001

9. Install in the reverse order of removal.



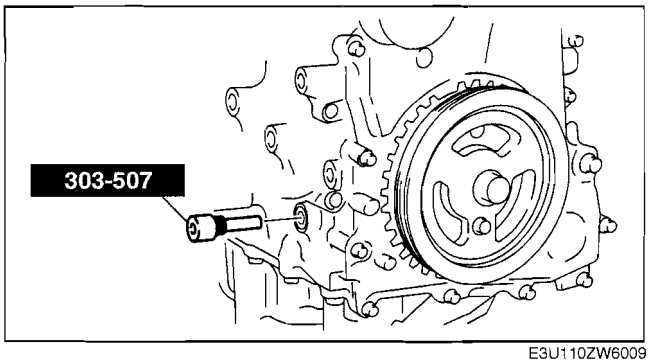
B3E0110W123

1	Crankshaft pulley lock bolt (See 01-10A-25 Crankshaft Pulley Lock Bolt Removal Note.) (See 01-10A-26 Crankshaft Pulley Lock Bolt Installation Note.)

2	Crankshaft pulley
3	Front oil seal (See 01-10A-25 Front Oil Seal Removal Note.) (See 01-10A-25 Front Oil Seal Installation Note.)

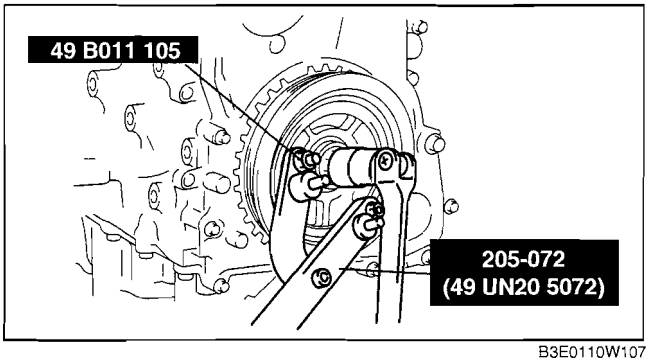
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.
3. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



E3U110ZW6009

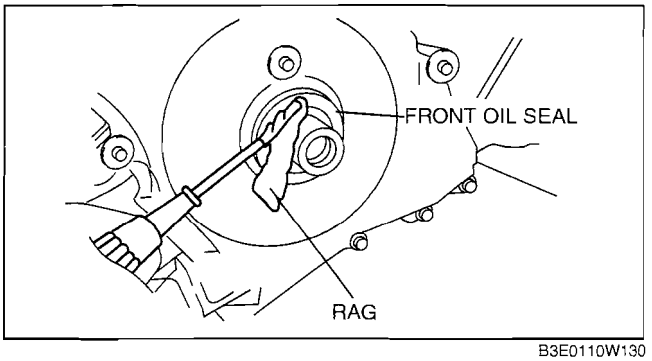
4. Hold the crankshaft pulley using the **SSTs**.



B3E0110W107

Front Oil Seal Removal Note

1. Cut the oil seal lip using a razor knife.
2. Remove the oil seal using a screwdriver wrapped with a rag.

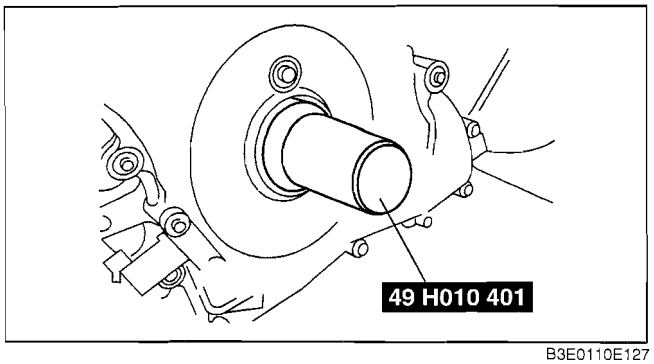


B3E0110W130

Front Oil Seal Installation Note

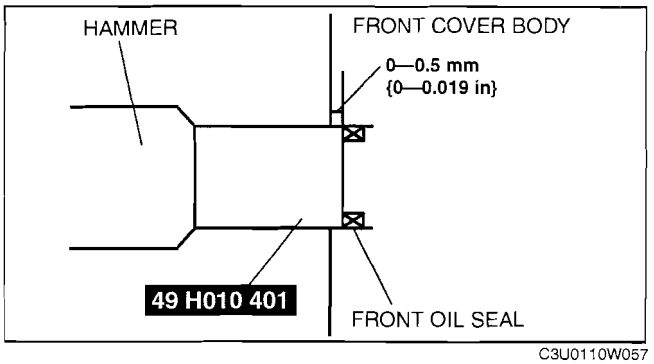
1. Apply clean engine oil to the oil seal lip.
2. Push the oil seal slightly in by hand.

3. Tap the oil seal in evenly using the **SST** and a hammer.



B3E0110E127

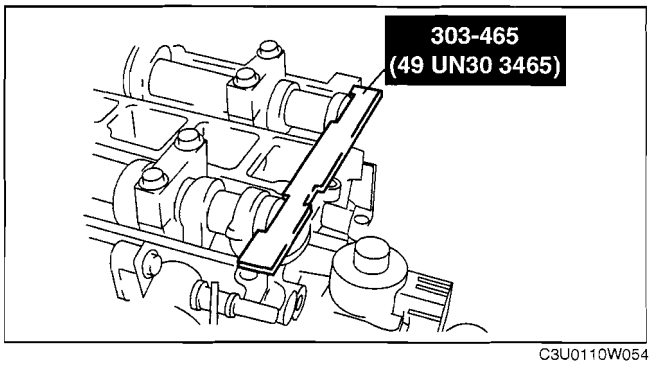
Front oil seal press-in amount
0—0.5 mm {0—0.019 in}



C3U0110W057

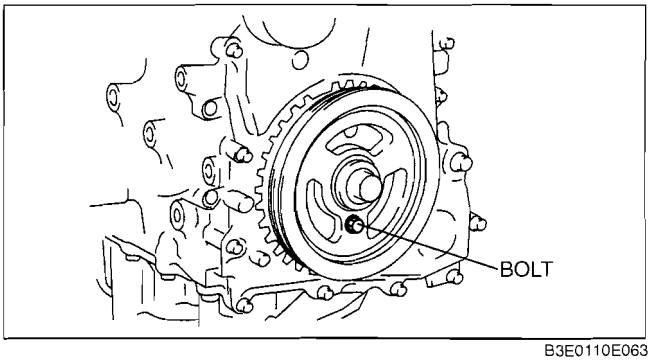
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** on the camshaft as shown in the figure.



C3U0110W054

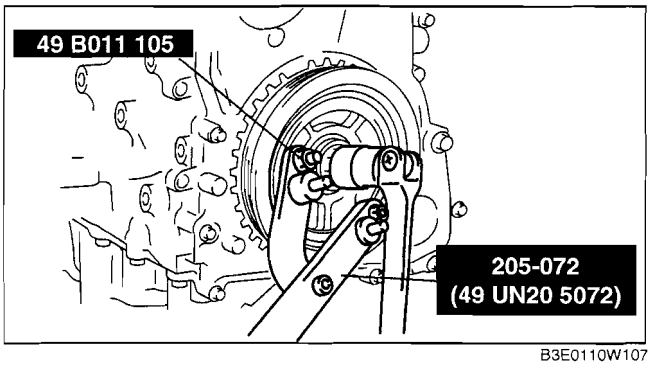
2. Install the **M6 x 1.0** bolt in by hand.
3. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight is attached to the **SST**).



B3E0110E063

4. Hold the crankshaft pulley using the **SSTs**.
5. Tighten the crankshaft pulley lock bolt in the order shown following two steps using the **SST (49 D032 316)**.

Tightening torque
(1) 96—104 N·m
{9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}
(2) 87°—93°

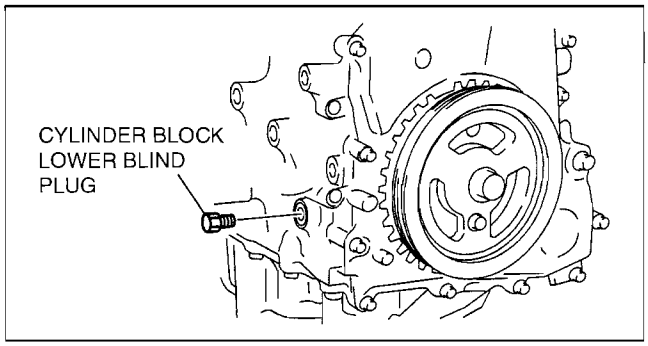


B3E0110W107

6. Remove the **M6 x 1.0** bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.

9. Rotate the crankshaft clockwise 2 turns until the TDC position.
   - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.

Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



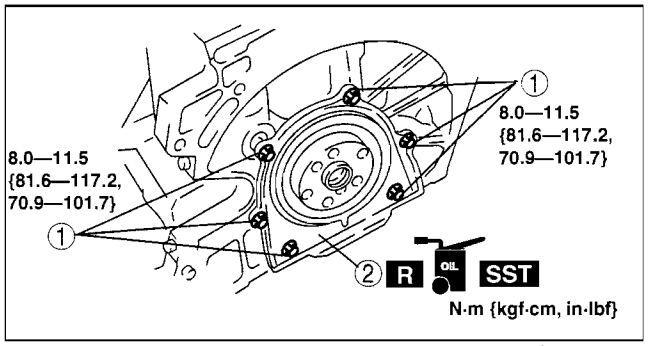
B3E0110W061

REAR OIL SEAL REPLACEMENT[LF, L3]

id0110a2800900

1. Remove the flywheel. (MTX) (See 05-10-11 CLUTCH UNIT REMOVAL/INSTALLATION.)
2. Remove the drive plate. (ATX) (See 05-17A-42 DRIVE PLATE REMOVAL/INSTALLATION[FN4A-EL].) (See 05-17B-58 DRIVE PLATE REMOVAL/INSTALLATION[FS5A-EL].)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

1	Bolt
2	Rear oil seal (See 01-10A-27 Rear Oil Seal Installation Note.)



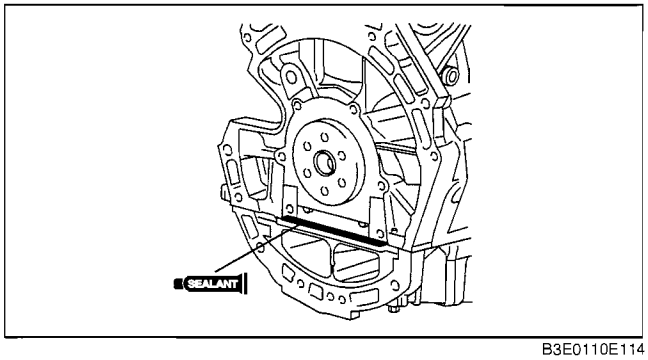
C3U0110W124

Rear Oil Seal Installation Note

1. Apply silicone sealant to the mating faces as shown in the figure.

Caution
- **Install the rear oil seal within 10 min of applying the silicone sealant.**

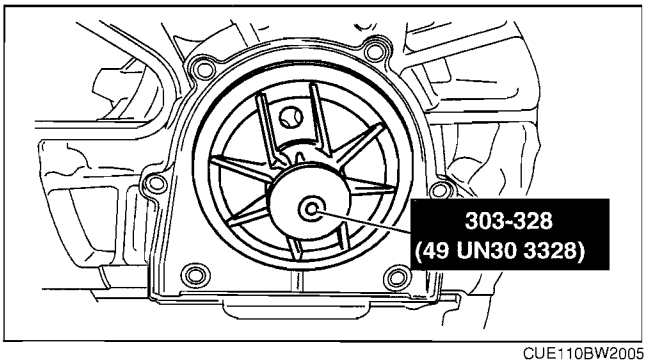
Thickness
4.0—6.0 mm {0.16—0.23 in}



B3E0110E114

2. Apply clean engine oil to the new oil seal lip.

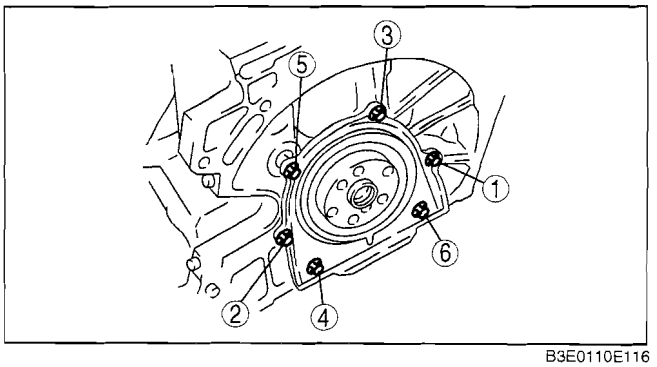
3. Install the rear oil seal using the **SST** as shown in the figure.



CUE110BW2005

4. Tighten the rear oil seal bolts in the order as shown in the figure.

Tightening torque
8.0—11.5 N·m
{81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}



B3E0110E116

ENGINE REMOVAL/INSTALLATION[LF, L3]

id0110a2800400

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)**

Note
- Perform the engine and transaxle component removal/installation from below the vehicle.

1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the air hose and air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
3. Remove the battery cover, battery duct, battery clamp, battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the fuel hose. (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
5. Remove the following parts.
   (1) Accelerator cable and bracket
   (2) Front wheels and tires (See 02-10-1 GENERAL PROCEDURES (SUSPENSION).)
   (3) Under cover and splash shields
   (4) A/C drive belt (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
   (5) A/C compressor with the pipes still connected

Note
- Secure the A/C compressor using wire or rope so that it is out of the way.

6. Drain the transaxle oil (MTX) or ATF (ATX). (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R].) (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].) (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
7. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
8. Disconnect the brake vacuum hose.
9. Remove the following parts.
   (1) Member (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (2) Front crossmember, front stabilizer, lower arm, steering gear and No.1 engine mount rubber component (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.)
   (3) Drive shafts (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.)
   (4) Coolant reserve tank with the hose still connected
   (5) Cooling fan component (See 01-12A-6 RADIATOR REMOVAL/INSTALLATION[LF, L3].)
   (6) ATF hose, selector cable and wiring harness (ATX) (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
   (7) Shift cable (MTX) (See 05-15B-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[A26M-R].)
   (8) Clutch release cylinder with the pipe still connected (MTX) (See 05-10-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.)
10. Disconnect the heater hose.
11. Disconnect the upper and lower radiator hose.
12. Disconnect the main silencer. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
13. Remove in the order indicated in the table.

14. Install in the reverse order of removal.

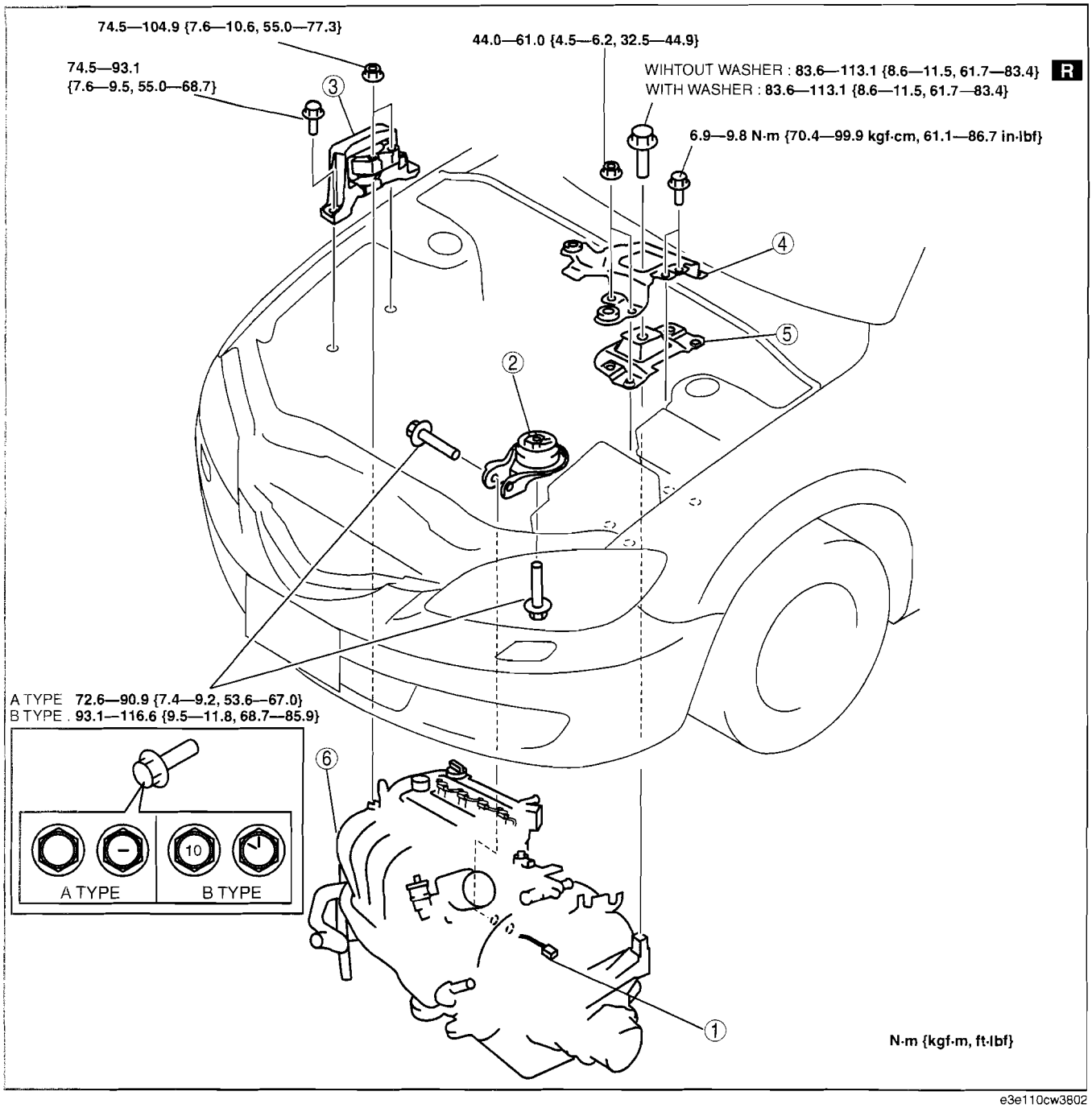
Caution

- **Do not tighten the No.1 engine mount rubber installation bolt before tightening the No.3 engine mount rubber installation bolt. (See 01-10A-31 No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note.)**

15. Start the engine. And inspect and adjust them if necessary.
16. Inspect the following and adjust them if necessary.
    - Front wheel alignment (See 02-11-2 FRONT WHEEL ALIGNMENT.)
    - Puller and belt for runout and contact
    - Leakage of engine oil, engine coolant, ATF, transaxle oil, and fuel
    - Ignition timing, idle speed, and amount of CO, HC (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
    - Engine-driven accessories operation

Note

- If the engine is overhauled and installed to the vehicle, perform the road test and verify that there is no abnormality.



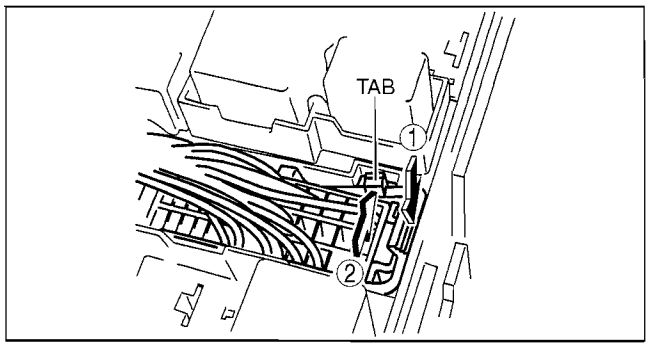
e3e110cw3802

1	Main fuse block connector (See 01-10A-31 Main Fuse Block Connector Removal Note.)
2	No.1 engine mount rubber (See 01-10A-33 No.1 Engine Mount Rubber Installation Note.)
3	No.3 Engine mount (See 01-10A-31 No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note.) (See 01-10A-31 No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note.)
4	Dynamic damper (if equipped)

5	Battery bracket
6	No.4 Engine mount rubber (See 01-10A-31 No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note.) (See 01-10A-31 No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note.)
7	Engine, transaxle

Main Fuse Block Connector Removal Note

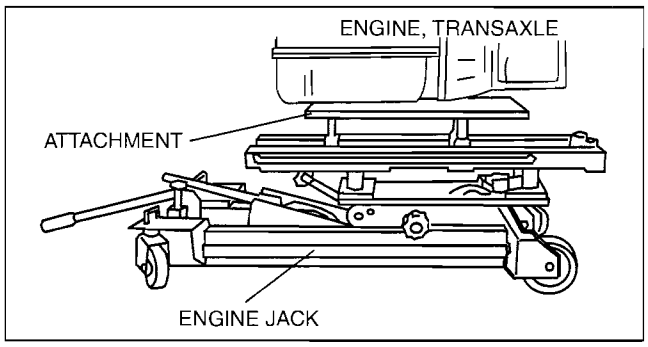
1. Release the tab in the order shown in the figure.
2. Pull the lock lever up and remove the connector.



am3uuw0000104

No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note

1. Secure the engine and the transaxle using an engine jack and attachment as shown in the figure.



am3uuw0000105

No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note

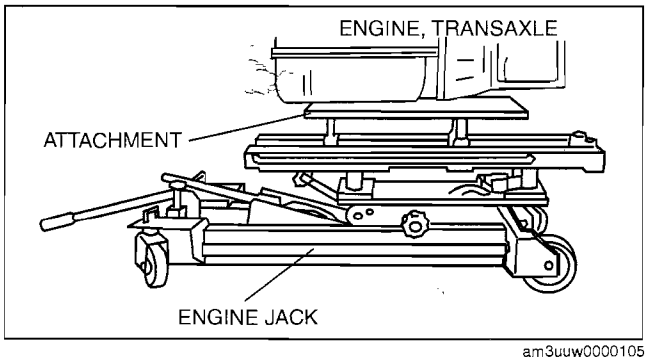
1. Secure the engine and the transaxle using an engine jack and attachment as shown in the figure.
2. Install the No.1 engine mount rubber and No.4 engine mount rubber.

Caution

- **Do not reuse the No.4 engine mount rubber installation bolt unless it has a washer.**

Note

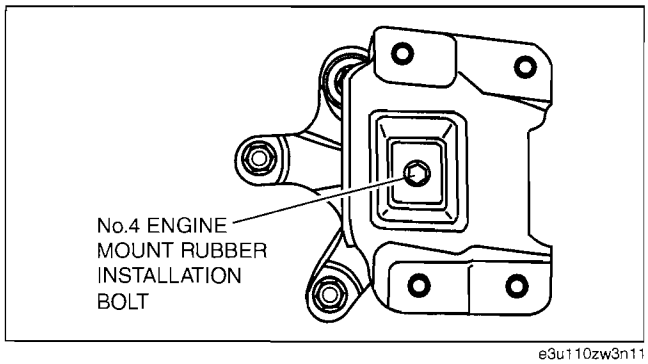
- Do not tighten the bolt and nut for the No.1 engine mount rubber and No.4 engine mount rubber during this step.



am3uuw0000105

3. Tighten the No.4 engine mount rubber installation bolt as shown in the figure.

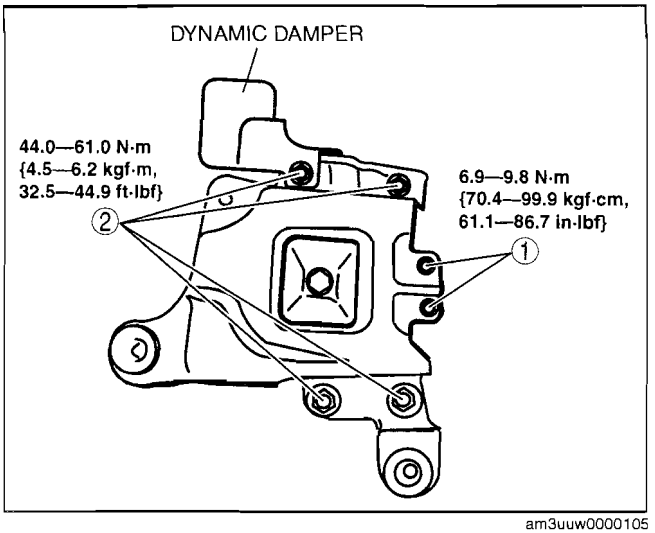
Tightening torque
83.6—113.1 N·m
{8.6—11.5 kgf·m, 61.7—83.4 ft·lbf}



e3u110zw3n11

4. Tighten the No.4 engine mount rubber and battery bracket bolts and nuts in the order as shown in the figure.

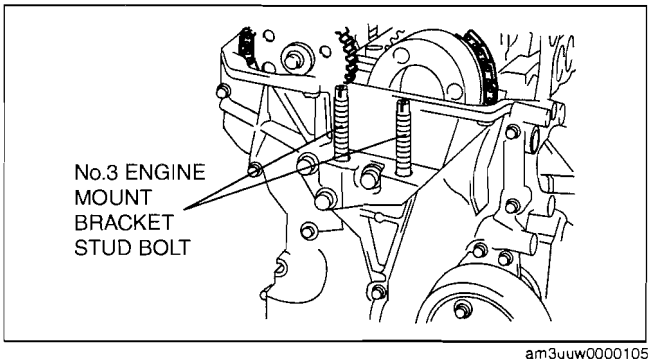
Tightening torque
(1) 6.9—9.8 N·m
{70.4—99.9 kgf·cm, 61.1—86.7 in·lbf}
(2) 44.0—61.0 N·m
{4.5—6.2 kgf·m, 32.5—44.9 ft·lbf}



am3uuw0000105

5. Tighten the No.3 engine mount bracket stud bolts.

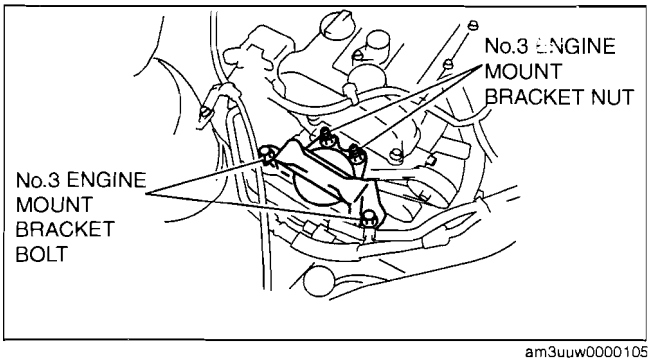
Tightening torque
7.0—13 N·m
{71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}



am3uuw0000105

6. Tighten the No.3 engine joint bracket bolts and nuts in the order as shown in the figure.

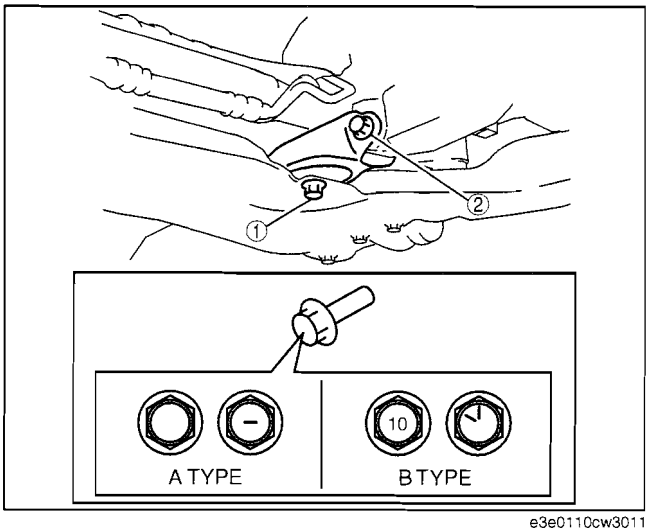
Tightening torque
Nuts : 74.5—104.9 N·m {7.6—10.6 kgf·m, 55.0—77.3 ft·lbf}
Bolts : 74.5—93.1 N·m {7.6—9.5 kgf·m, 55.0—68.7 ft·lbf}



am3uuw0000105

No.1 Engine Mount Rubber Installation Note

1. Remove the engine jack and attachment.
2. Tighten the No.1 engine mount rubber installation bolts as shown in the figure.



e3e0110cw3011

Caution

- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

Bolt stem length

Front cross member bolt : 62mm {2.44 in}
No.1 engine mount bracket bolt : 65mm {2.56 in}

Tightening torque

A type : 72.6—90.9 N·m {7.40—9.2 kgf·m, 53.6—67.0 ft·lbf}
B type : 93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

ENGINE DISASSEMBLY/ASSEMBLY[LF, L3]

id0110a2800500

1. Disconnect the engine and transaxle. (See 05-15A-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R].) (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
2. Remove the following part.
   (1) Intake-air system (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (2) Generator (See 01-17A-6 GENERATOR REMOVAL/INSTALLATION[LF, L3].)
   (3) Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   (4) Crankshaft position (CKP) sensor (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
3. Assemble in the reverse order of disassembly.

VARIABLE VALVE TIMING ACTUATOR INSPECTION[LF, L3]

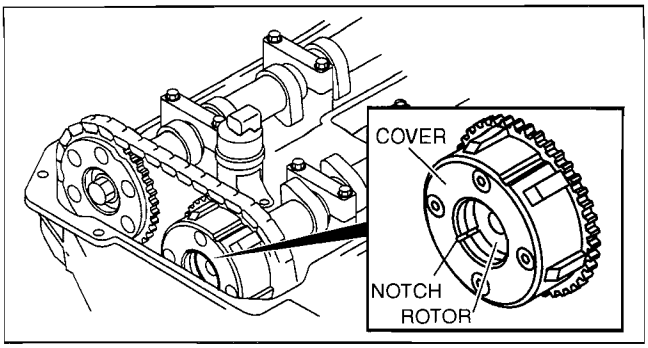
id0110a2801200

Caution

- **Variable valve timing actuator can not be disassembled it is a precision unit.**

1. Disconnect the negative battery cable.
2. Remove the following parts.
   - Plug hole plate (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
   - Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   - Oil control valve connector
   - Ventilation hose
   - Cylinder head cover
3. Confirm that notch of the rotor and bump of the cover at the variable valve timing actuator are aligned and fitted.
   - If the notch and the bump are not aligned, turn the crankshaft clockwise two rotations. Verify that the bump and the notch are aligned.
   - If the bump and notch are still not aligned, replace the variable valve timing actuator.
   - If, when turning the crankshaft, there is a hitting noise from the variable valve timing actuator each time the cam passes the fully lifted position, it means that the actuator is not secured. Replace the actuator.

4. Install the following parts.
   - Cylinder head cover (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
   - Ventilation hose
   - Oil control valve connector
   - Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   - Plug hole plate (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)



C3U0110W070

VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[LF, L3]

id0110a2803700

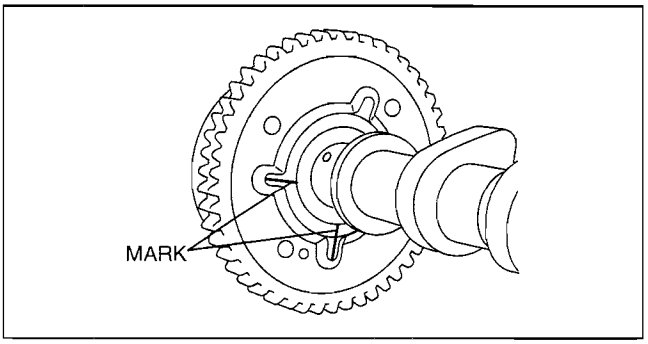
Caution
- **Variable valve timing actuator can not be disassembled because it is a precision unit.**

Note
- Intake camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Follow the valve clearance adjustment procedure from 1 to 12 and remove the intake camshaft and variable valve timing actuator as a single unit.
   (See 01-10A-7 VALVE CLEARANCE ADJUSTMENT[LF, L3].)
2. Remove the variable valve timing actuator.
   (1) Mark the camshaft and variable valve timing actuator as shown in the figure to make sure they are installed in their original position.

Note
- Do not add scratch marks to the camshaft thrust area.

   (2) Secure the camshaft in a vise.
   (3) Loosen the variable valve timing actuator tightening bolt.

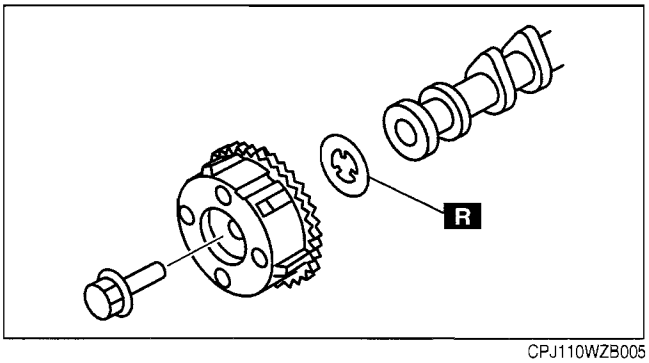


B3J110BWB001

3. Install a new washer.
4. Install the variable valve timing actuator.
   (1) Secure the camshaft in a vise.
   (2) Align the marks of the camshaft and variable valve timing actuator.

Caution
- **When the variable valve timing actuator is replaced with a new one, mark it in the same location as the old one.**

   (3) Tighten variable valve timing actuator tightening bolt.



CPJ110WZB005

Tightening torque
69—75 N·m {7.1—7.6 kgf·m, 50.9—55.3 ft·lbf}

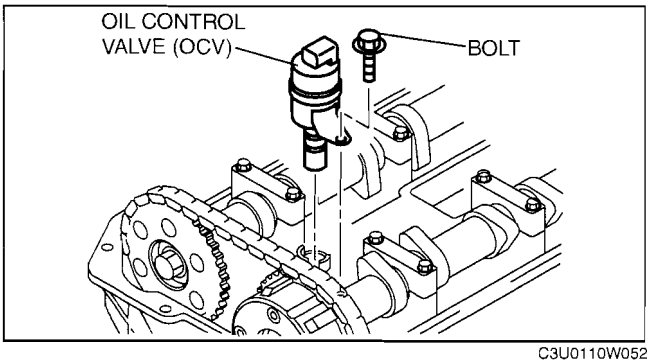
5. Follow the valve clearance adjustment procedure from 16 to 33 and install the intake camshaft and variable valve timing actuator.
   (See 01-10A-7 VALVE CLEARANCE ADJUSTMENT[LF, L3].)

OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[LF, L3]

id0110a2801300

1. Disconnect the negative battery cable.
2. Remove the following parts.
   - Plug hole plate (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
   - Ignition coils (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
   - Oil control valve (OCV) connector
   - Ventilation hose
   - Cylinder head cover (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
   - Oil control valve (OCV)
3. Install in the reverse order of removal.

Tightening torque
8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}



C3U0110W052

OIL CONTROL VALVE (OCV) INSPECTION[LF, L3]

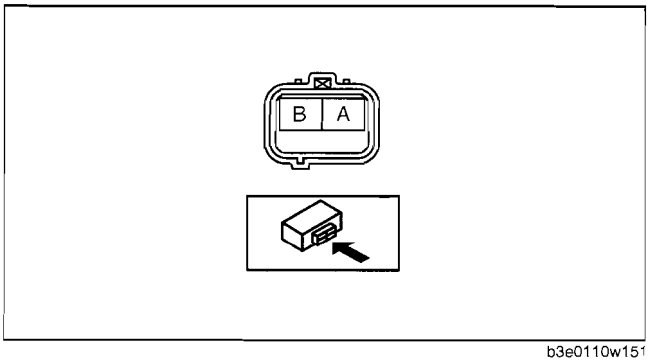
id0110a2801400

Coil Resistance Inspection

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the oil control valve connector.
4. Measure the resistance between terminals A and B using an ohmmeter.
   - If not as specified, replace the oil control valve.

Specification
6.9—7.9 ohms [20°C {68°F}]

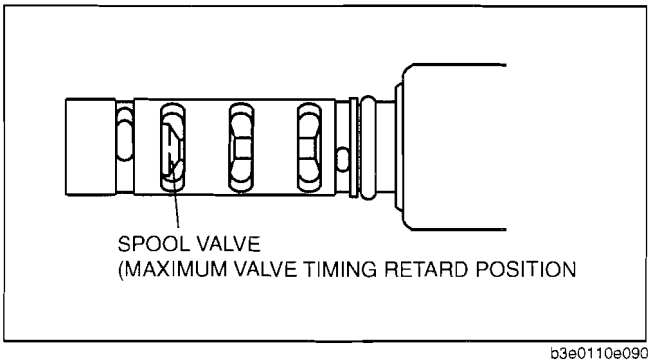
5. Connect the oil control valve connector.
6. Install the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
7. Connect the negative battery cable.



b3e0110w151

Spool Valve Operation Inspection

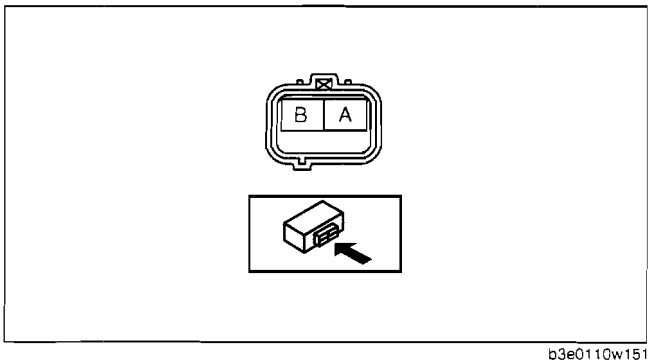
1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the oil control valve connector.
4. Remove the oil control valve.
5. Verify that the spool valve in the oil control valve is in the maximum valve timing retard position as indicated in the figure.
   - If not as specified, replace the oil control valve.
6. Verify that the battery is fully charged.
   - If not as specified, recharge the battery.



b3e0110e090

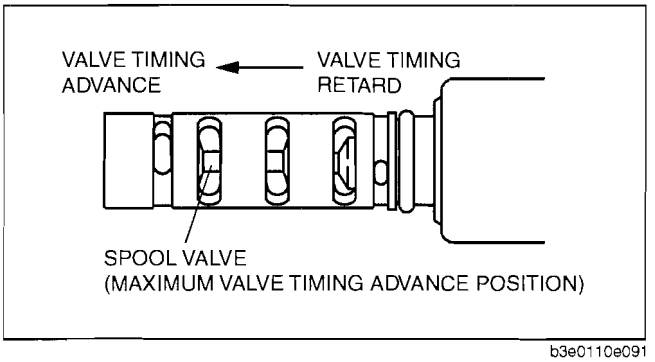
7. Apply battery positive voltage between the oil control valve terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.
   - If not as specified, replace the oil control valve.

   Note
   - When applying battery positive voltage between the oil control valve terminals, the connection can be either of the following:
     — Positive battery cable to terminal A, negative battery cable to terminal B
     — Positive battery cable to terminal B, negative battery cable to terminal A



b3e0110w151

8. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.
   - If not as specified, replace the oil control valve.
9. Connect the oil control valve connector.
10. Install the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
11. Disconnect the negative battery cable.



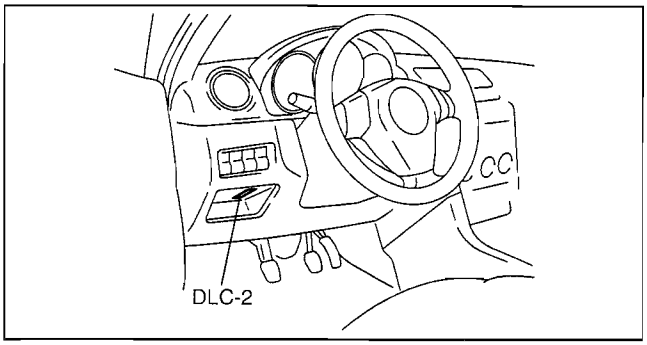
b3e0110e091

ENGINE TUNE-UP[LF, L3]

id0110a2800600

Engine Tune-up Preparation

1. Turn off all electrical loads.
2. Warm up the engine as follows.
   (1) Start the engine.
   (2) Maintain the engine speed **2,500—3,000 rpm** until the cooling fans start to operate.
   (3) Release the accelerator pedal.
   (4) Wait until the cooling fans stop.
3. Connect the **SST** (M-MDS) to the DLC-2.



B3E0102W003

Ignition Timing Inspection

Note
- Ignition timing is not adjustable.
- Ignition timing verification requires M-MDS.

1. Verify that the ignition timing (M-MDS: SPARKADV PID) is within the specification using M-MDS.

Ignition timing
Approx. BTDC 8°

2. Verify that ignition timing advances when the engine speed increases gradually.
   - If there malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)

Idle Speed Inspection

Note
- Idle speed is not adjustable.
- Idle speed verification requires M-MDS.

1. Verify that the idle speed (M-MDS: RPM PID) is within the specification using M-MDS.

Idle speed [MTX (Neutral position)]
No load: 600—700 rpm
Electrical loads*2 ON (38—48 A): 650—750 rpm
Electrical loads*2 ON (more than 48 A): 700—800 rpm
A/C ON and refrigerant pressure switch (middle) OFF: 700—800 rpm
A/C ON and refrigerant pressure switch (middle) ON: 700—800 rpm
Idle speed [ATX (P or N position)]
No load: 650—750 rpm
Electrical loads*2 ON (38—48 A): 650—750 rpm
Electrical loads*2 ON (more than 48 A): 700—800 rpm
A/C ON and refrigerant pressure switch (middle) OFF: 650—750 rpm
A/C ON and refrigerant pressure switch (middle) ON: 670—770 rpm

*1 Excludes temporary idle speed drop just after the electrical loads are turned on.
*2. generator generating current value.

- If there malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)

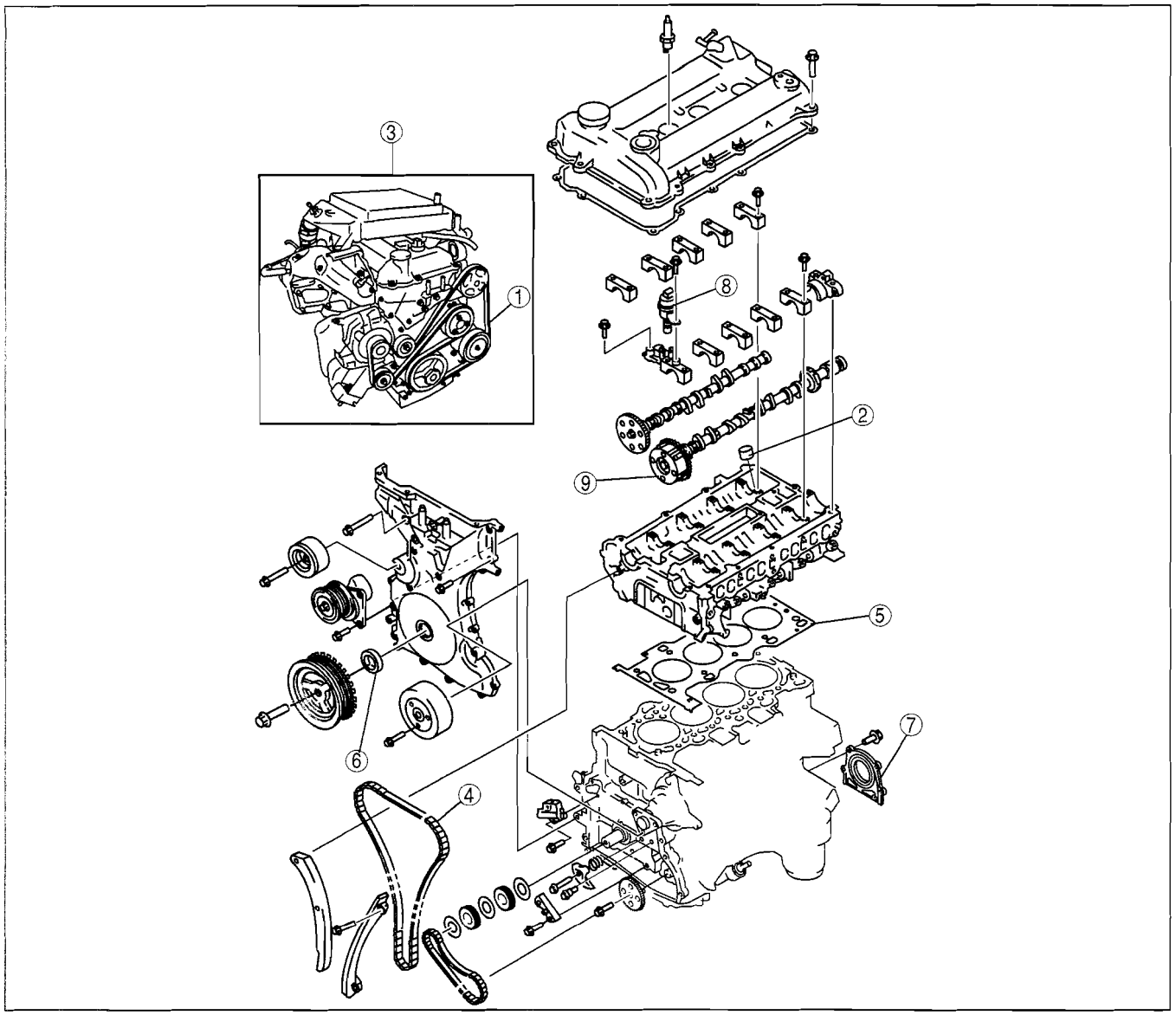
Idle Mixture Inspection

1. Verify that the idle speed and ignition timing are within the specification. (See 01-10A-37 Idle Speed Inspection.) (See 01-10A-37 Ignition Timing Inspection.)
2. Insert an exhaust gas analyzer to the tailpipe.
3. Verify that the CO and HC concentrations are within the regulation.
   - If there malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)

01-10B MECHANICAL [L3 WITH TC]

MECHANICAL LOCATION INDEX[L3 WITH TC]

id011039800100



acxuuw00000134

1	Drive belt (See01-10B-3 DRIVE BELT INSPECTION[L3 WITH TC].) (See01-10B-3 DRIVE BELT REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-10B-4 DRIVE BELT AUTO TENSIONER INSPECTION[L3 WITH TC].)
2	Tappet (See01-10B-4 VALVE CLEARANCE INSPECTION/ ADJUSTMENT[L3 WITH TC].)
3	Engine (See01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].) (See01-10B-28 ENGINE REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-10B-32 ENGINE DISASSEMBLY/ ASSEMBLY[L3 WITH TC].) (See01-10B-35 ENGINE TUNE-UP[L3 WITH TC].)
4	Timing chain (See01-10B-10 TIMING CHAIN REMOVAL/ INSTALLATION[L3 WITH TC].)

5	Cylinder head gasket (See01-10B-20 CYLINDER HEAD GASKET REPLACEMENT[L3 WITH TC].)
6	Front oil seal (See01-10B-24 FRONT OIL SEAL REPLACEMENT[L3 WITH TC].)
7	Rear oil seal (See01-10B-27 REAR OIL SEAL REPLACEMENT[L3 WITH TC].)
8	OCV (See01-10B-33 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[L3 WITH TC].) (See01-10B-34 OIL CONTROL VALVE (OCV) INSPECTION[L3 WITH TC].)
9	Variable valve timing actuator (See01-10B-32 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[L3 WITH TC].) (See01-10B-33 VARIABLE VALVE TIMING ACTUATOR INSPECTION[L3 WITH TC].)

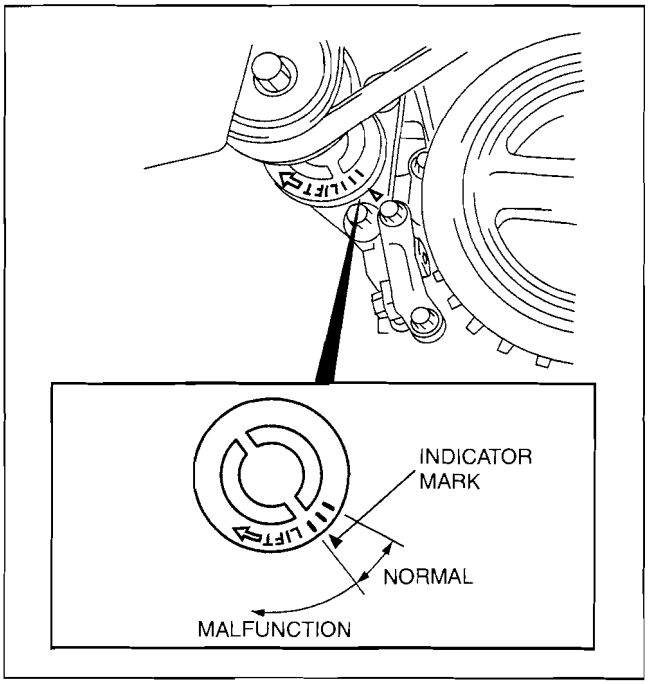
DRIVE BELT INSPECTION[L3 WITH TC]

id011039801500

Note

- Drive belt deflection/tension inspection is not necessary because of the use of the drive belt auto tensioner.

1. Verify that the drive belt auto tensioner indicator mark does not exceed the limit.
   - If it exceeds the limit, replace the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/ INSTALLATION[L3 WITH TC].)

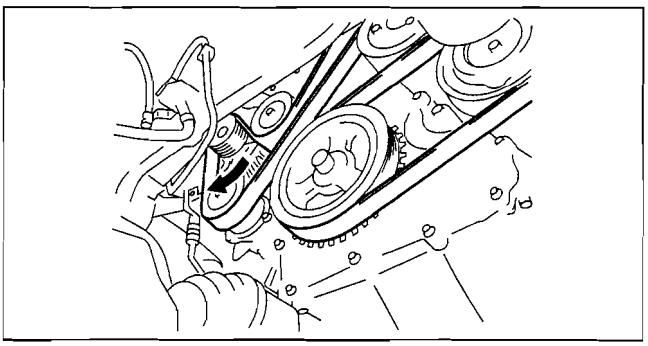


acxuuw00000135

DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC]

id011039801600

1. Remove the splash shield (RH).
2. Rotate the drive belt auto tensioner in the direction shown in the figure and remove the drive belt.
3. Install the drive belt.
4. Verify that the drive belt auto tensioner indicator mark does not exceed the limit. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].)
5. Install the splash shield (RH).

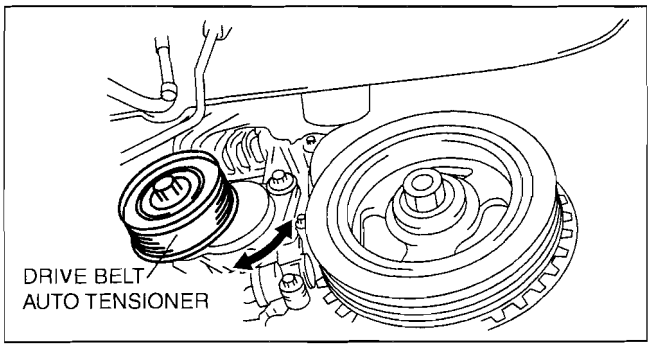


acxuuw00000136

DRIVE BELT AUTO TENSIONER INSPECTION[L3 WITH TC]

id011039801700

1. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
2. Verify that the drive belt auto tensioner moves smoothly in the operational direction.
   - Replace the drive belt auto tensioner if necessary.
3. Rotate the drive belt auto tensioner pulley by hand and verify that it rotates smoothly.
   - Replace the drive belt auto tensioner if necessary.
4. Install the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)



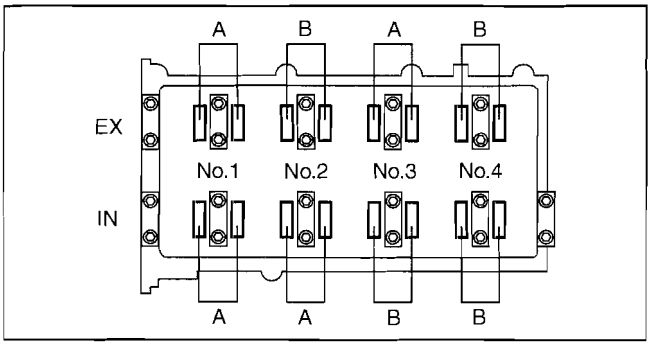
acxuuw00000137

VALVE CLEARANCE INSPECTION/ADJUSTMENT[L3 WITH TC]

id011039800200

Valve Clearance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the splash shield (RH).
4. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
7. Disconnect the wiring harness.
8. Remove the ventilation hose.
9. Remove the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
10. Measure the valve clearance.
    (1) Rotate the crankshaft clockwise so that the No.1 cylinder is at TDC of the compression stroke.
    (2) Measure the valve clearance of location A shown in the figure.



acxuuw00000156

Standard valve clearance [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.011 in}
EX: 0.27—0.33 mm {0.011—0.012 in}

    (3) If it is not within the specification, replace the tappet and adjust the valve clearance to the median value of the standard.

Note
- Make sure to note down the measured values for choosing the suitable replacement tappets.

    (4) Rotate the crankshaft clockwise **360**° so that the No.4 cylinder is at TDC of the compression stroke.
    (5) Measure the valve clearance of location B shown in the figure.

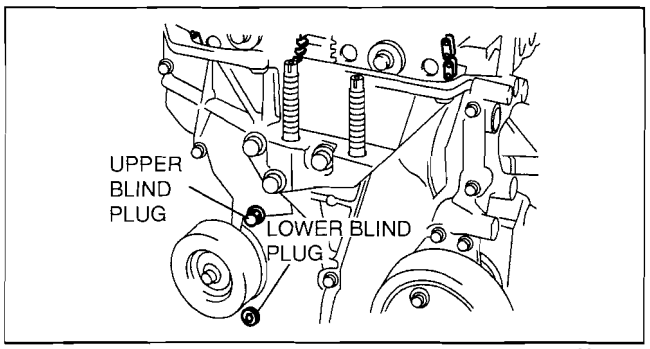
Standard valve clearance [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.011 in}
EX: 0.27—0.33 mm {0.011—0.012 in}

    (6) If not within the specification, replace the tappet and adjust the valve clearance to the median value of the standard.
11. Install the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
12. Install the ventilation hose.
13. Connect the wiring harness.
14. Install the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
15. Install the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)

16. Install the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
17. Install the splash shield (RH).
18. Connect the negative battery cable.
19. Install the battery cover.

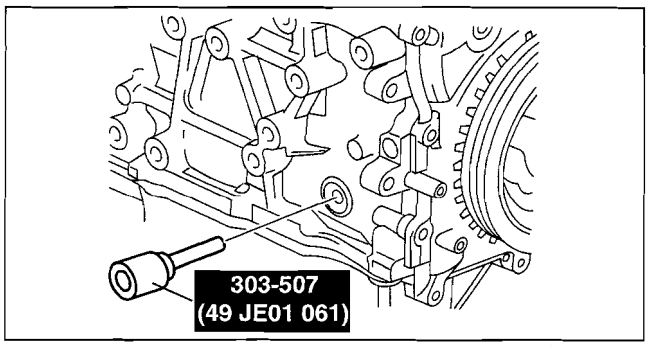
Valve Clearance Adjustment

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the splash shield (RH).
4. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
7. Disconnect the wiring harness.
8. Remove the ventilation hose.
9. Remove the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
10. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
11. Remove the engine front cover lower blind plug.
12. Remove the engine front cover upper blind plug.



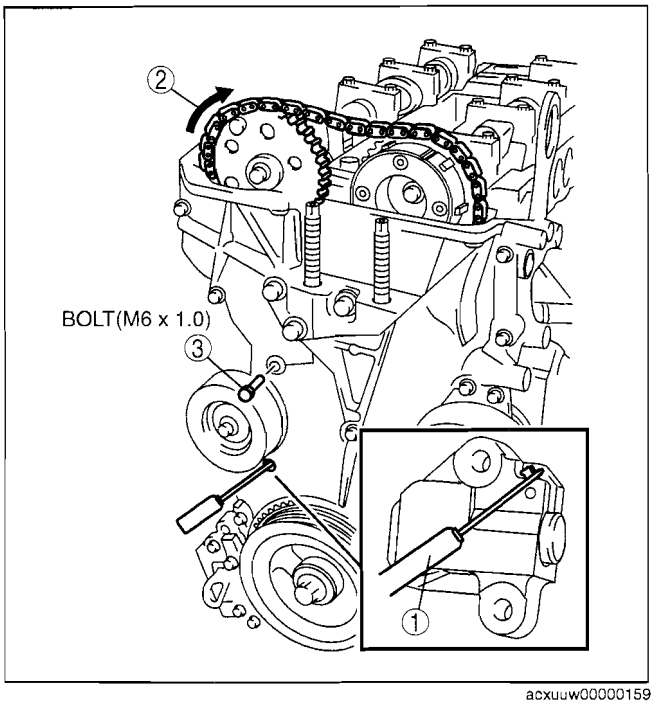
acxuuw00000157

13. Remove the cylinder block lower blind plug, and install the **SST.**
14. Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the crank weight contacts **SST** and stops.)



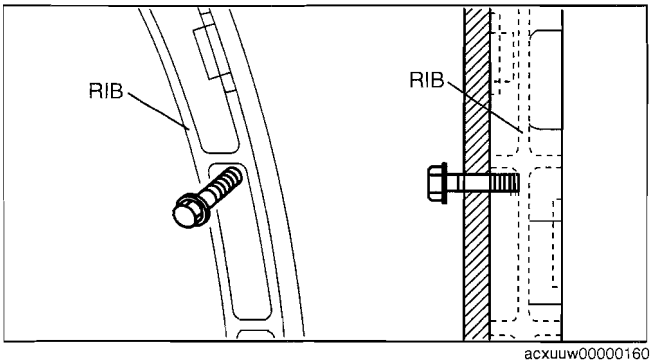
am3zzw0000350

15. Release the tension on the timing chain shown in the figure.
    (1) Using a suitable screwdriver or equivalent tool, unlock the chain tensioner ratchet.
    (2) Rotate the exhaust camshaft clockwise using a suitable wrench on the cast hexagon and loosen the tension on the timing chain.



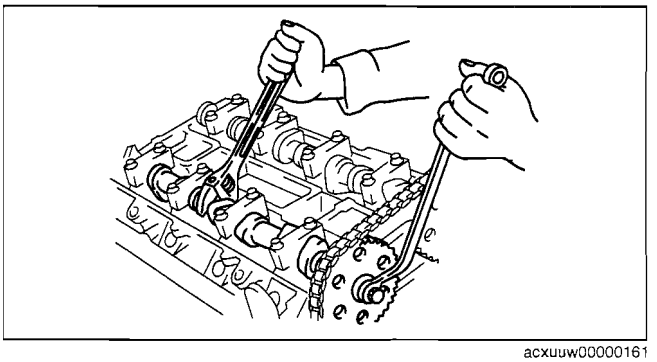
acxuuw00000159

(3) Using a suitable bolt **(M6 X 1.0 length 25mm—35mm {0.99—1.3 in})** at the engine front cover upper blind plug, secure the tensioner arm at the position where the tension is released.

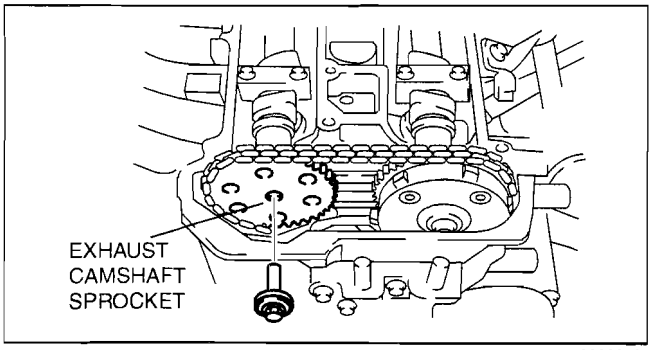


acxuuw00000160

16. Fix the exhaust camshaft using a wrench on the cast hexagon, and loosen the camshaft sprocket installation bolt.

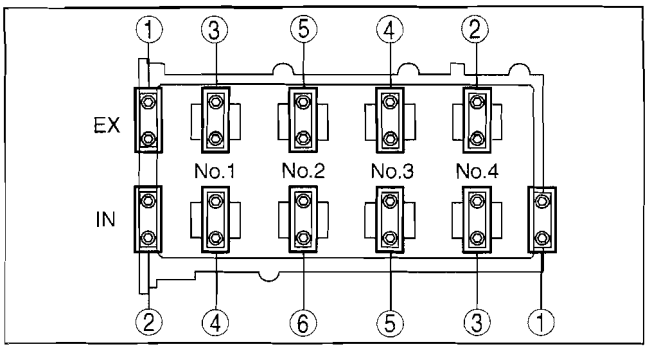

acxuuw00000161

17. Remove the installation bolt and remove the exhaust camshaft sprocket.
18. Remove the oil control valve (OCV). (See 01-10B-33 OIL CONTROL VALVE (OCV) REMOVAL/ INSTALLATION[L3 WITH TC].)



acxuuw00000162

19. Loosen the camshaft cap bolts in two or three passes in the order shown in the figure and remove the camshaft cap.



acxuuw00000163

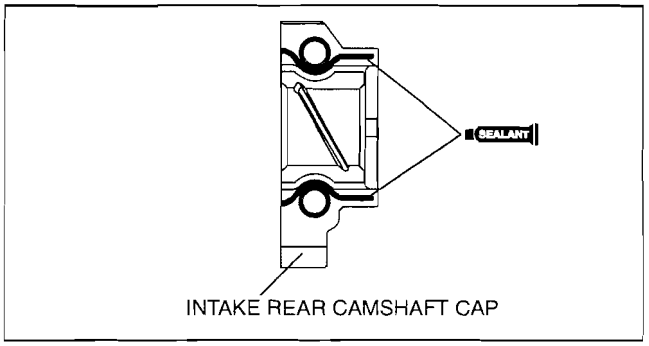
Note
- The camshaft caps are to be kept ordered for correct reassembly in their original positions. Do not mix the caps.

20. Remove the camshafts for the intake and exhaust sides.
21. Remove the tappet.
22. Install an appropriate tappet based on the results of the valve clearance inspection.
    Selected tappet = Removed tappet thickness + Measured valve clearance - Standard valve clearance

Standard valve clearance [Engine cold]
IN: 0.22—0.28 mm {0.0087—0.011 in}
EX: 0.27—0.33 mm {0.011—0.012 in}

23. Install the camshaft with No.1 cylinder cam aligned at TDC of the compression stroke.
24. Carefully apply adhesive agent to the area indicated in the figure so that it does not leak into the sliding part.

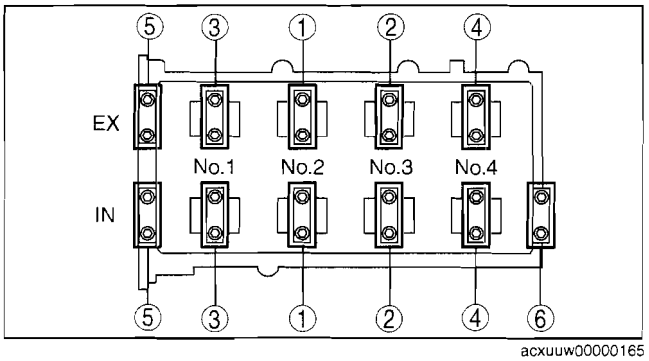
Thickness
1.0 mm {0.039 in}



acxuuw00000164

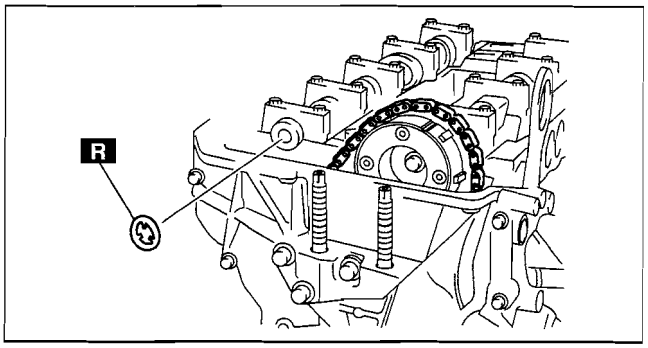
25. Install the camshaft caps and temporarily tighten the camshaft cap bolts evenly in two or three passes, and then tighten the camshaft cap bolts in two passes, using the following two steps and in the order shown in the figure.

Tightening procedure
1st step: 5.0—9.0 N·m {51—91 kgf·cm, 45—79 in·lbf}
2nd step: 14.0—17.0 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf



acxuuw00000165

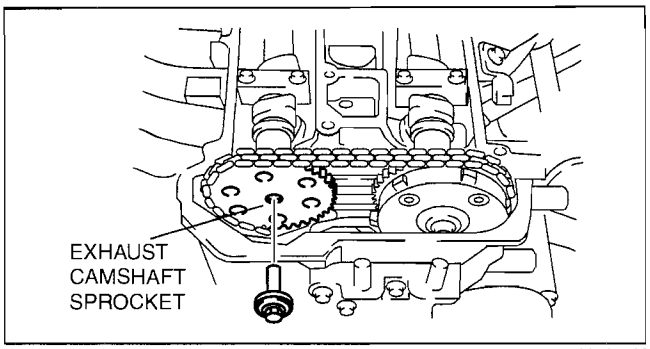
26. Install the OCV. (See 01-10B-33 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[L3 WITH TC].)
27. Install a new washer.



acxuuw00000166

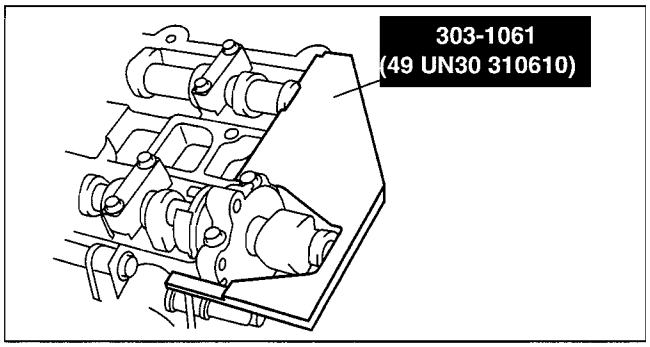
28. Install the exhaust camshaft sprocket.

Caution
- **Do not tighten the camshaft sprocket installation bolt at this stage. Verify the valve timing before performing the bolt tightening.**



acxuuw00000162

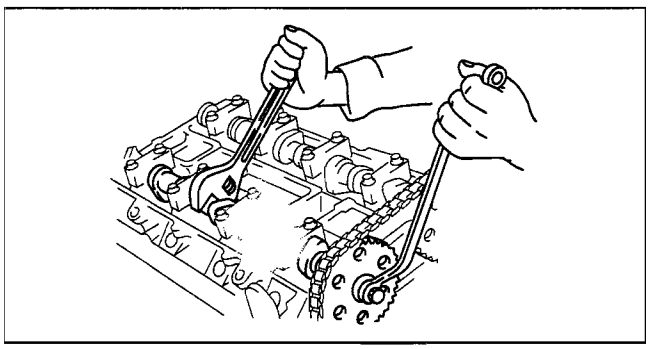
29. Install the **SST** on the camshaft as shown in the figure.
30. Remove the installation bolt for the engine front cover upper blind plug (**M6 X 1.0 length 25—35mm {0.99—1.3 in}**), and apply tension to the timing chain.
31. Rotate the crankshaft clockwise and verify that the No.1 cylinder is at TDC of the compression stroke. (The position crank weight contacts the **SST**.)



acxuuw00000167

32. Fix the exhaust camshaft using a wrench on the cast hexagon, and tighten the sprocket installation bolt.

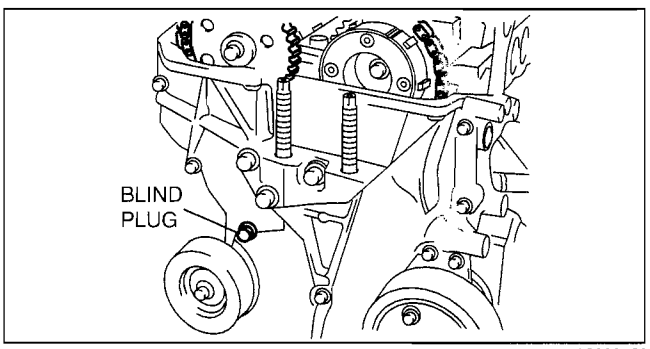
Tightening torque
69—75 N·m {7.1—7.6 kgf·m, 51—55 ft·lbf}



acxuuw00002396

33. Remove the **SST** from the camshaft.
34. Remove the **SST** installed in the cylinder block lower blind plug hole.
35. Rotate the crankshaft clockwise two turns and inspect the valve timing.
    - If it is not aligned, repeat the procedure.
36. Apply the silicone sealant and install the engine front cover upper blind plug.

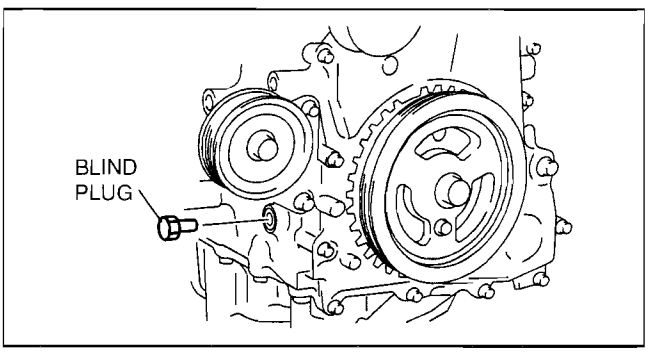
Tightening torque
8.0—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}



acxuuw00000168

37. Install the cylinder block lower blind plug.

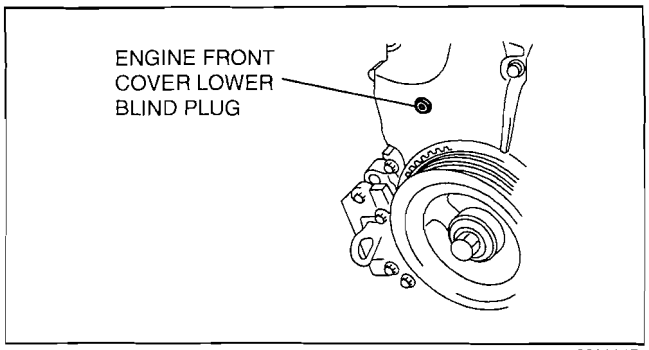
Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}



acxuuw00000169

38. Install a new engine front cover lower blind plug.

Tightening torque
10.0—14.0 N·m {102—142 kgf·cm, 89—123 in·lbf}



acxuuw00000170

39. Install the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
40. Install the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
41. Install the ventilation hose.
42. Connect the wiring harness.
43. Install the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
44. Install the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
45. Install the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
46. Install the splash shield (RH).
47. Connect the negative battery cable.
48. Install the battery cover.

COMPRESSION INSPECTION[L3 WITH TC]

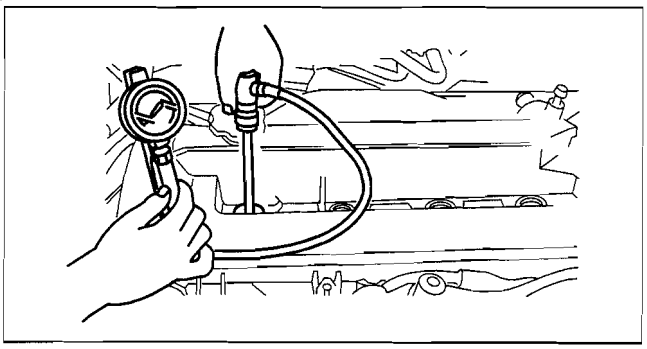
id011039800300

Warning
- **Hot engines can cause severe burns. Be careful not to burn yourself during removal/installation of each component.**
- **Fuel vapor is hazardous. It can very easily ignite, causing death, serious injury, or damage. Always keep sparks and flames away from fuel.**

1. Verify that the battery is completely charged. (See 01-17B-4 BATTERY INSPECTION[L3 WITH TC].)
2. Warm up the engine.

Warning
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can easily ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always perform the Fuel Line Safety Procedure. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)**

3. Remove the charge air cooler.
4. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove all the spark plugs. (See 01-18B-3 SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC])
6. Remove the fuel pump relay. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
7. Remove the fuel injector relay.
8. Measure the compression pressure using the following procedure.
   (1) Press the compression gauge into the spark plug hole.
   (2) Fully open the throttle valve.
   (3) Crank the engine and measure the compression pressure.


acxuuw00000151

Compression
Standard: 1,280 kPa {13.1 kgf/cm^2, 185.65 psi} [250rpm]
Minimum: 896 kPa {9.14 kgf/cm^2, 129.96 psi} [250rpm]
Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm^2, 28.5 psi}

   (4) Perform Steps (1) to (3) for all cylinders.

(5) If it is less than the minimum specification, or there is a cylinder with a compression value that differs from that of other cylinders by **196.1 kPa or more {2.0 kgf/cm^2, 28.5 psi}**, add a small quantity of engine oil through the spark plug hole and perform Steps (1) to (3).
- If the pressure increases by adding the engine oil, the piston ring or the cylinder surface is worn, or they are damaged. Perform overhaul servicing.
- If the pressure does not increase, valve seizure, valve attachment failure, or pressure leakage from the cylinder head gasket might be occurring. Perform overhaul servicing.

9. Install the fuel injector relay.
10. Install the fuel pump relay. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
11. Install the spark plugs. (See 01-18B-3 SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC])
12. Install the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
13. Install the charge air cooler.

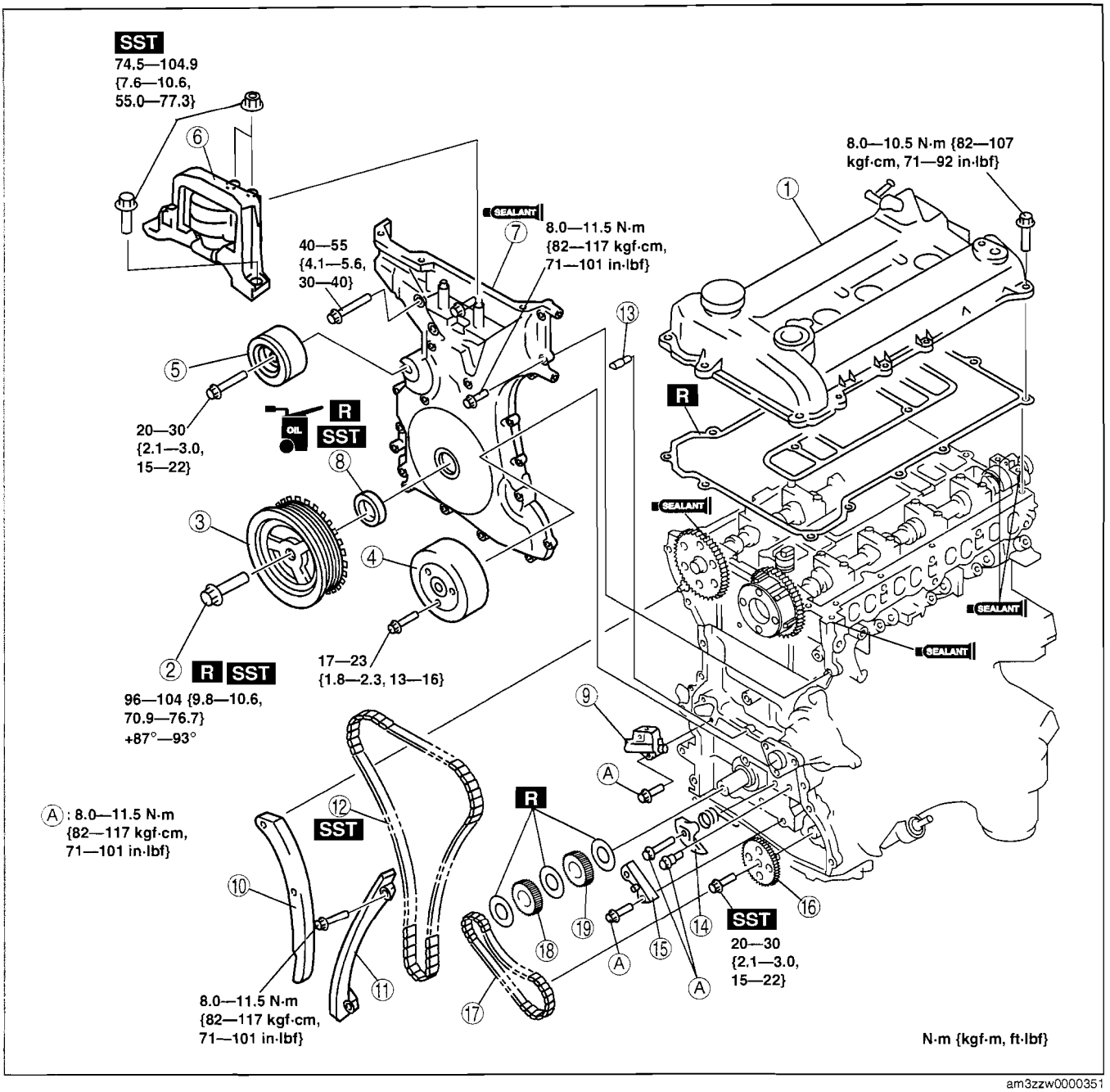
TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC]

id011039801000

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield.
4. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
7. Disconnect the wiring harness.
8. Remove the ventilation hose.
9. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
10. Remove the crankshaft position (CKP) sensor. (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
11. Remove the P/S oil pump with the hoses and pipes still connected. (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)

Note
- Position and secure the P/S oil pump out of the way with a rope or wire.

12. Remove in the order indicated in the figure.
13. Install in the reverse order of removal.
14. Start the engine and inspect and adjust the following:
    (1) Engine oil amount (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].)
    (2) Runout and contact of pulley and belt.
    (3) Ignition timing, idle speed, and idle mixture (CO and HC) verification (See 01-10B-35 ENGINE TUNE-UP[L3 WITH TC].)



am3zzw0000351

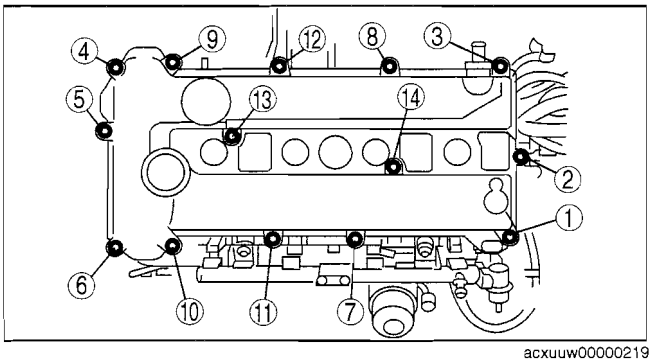
1	Cylinder head cover (See01-10B-12 Cylinder Head Cover Removal Note.) (See01-10B-19 Cylinder Head Cover Installation Note.)
2	Crankshaft pulley lock bolt (See01-10B-12 Crankshaft Pulley Lock Bolt Removal Note.) (See01-10B-18 Crankshaft Pulley Lock Bolt Installation Note.)
3	Crankshaft pulley
4	Water pump pulley
5	Front drive belt idler pulley
6	No. 3 engine mount (See01-10B-12 No.3 Engine Mount Removal Note.) (See01-10B-17 No.3 Engine Mount Installation Note)
7	Engine front cover (See01-10B-17 Engine Front Cover Installation Note.)

8	Front oil seal (See01-10B-14 Front Oil Seal Removal Note.) (See01-10B-16 Front Oil Seal Installation Note.)
9	Chain tensioner (See01-10B-14 Chain Tensioner Removal Note.)
10	Tensioner arm
11	Chain guide
12	Timing chain (See01-10B-16 Timing Chain Installation Note.)
13	Oil jet
14	Oil pump chain tensioner
15	Oil pump chain guide
16	Oil pump driven sprocket (See01-10B-15 Oil Pump Driven Sprocket Removal Note.) (See01-10B-16 Oil Pump Driven Sprocket Installation Note.)

17	Oil pump chain
18	Crankshaft sprocket
19	Oil pump drive sprocket (See01-10B-16 Oil Pump Driven Sprocket Installation Note.)

Cylinder Head Cover Removal Note

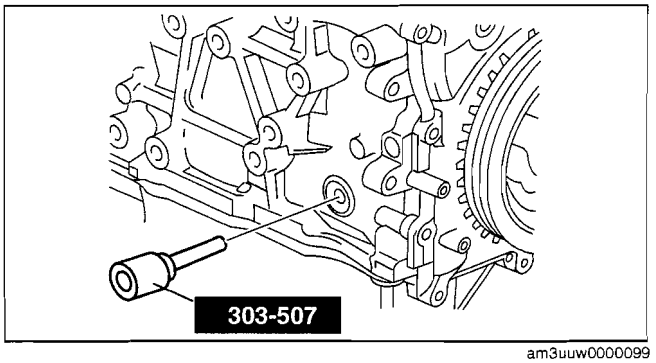
1. Loosen the cylinder head cover bolts in the order shown in the figure.



acxuuw00000219

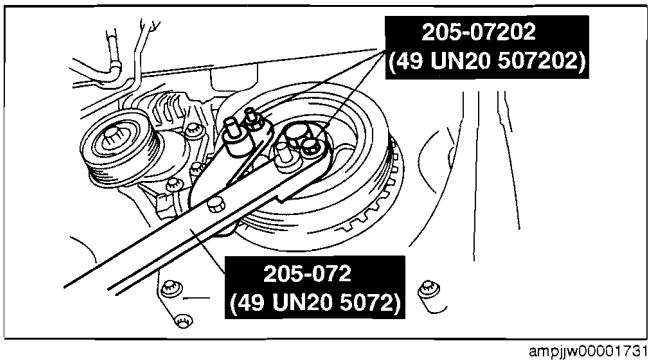
Crankshaft Pulley Lock Bolt Removal Note

1. Rotate the crankshaft in the direction of the engine rotation and remove the cylinder block lower blind plug when the No. 1 cylinder is at the point prior to top dead center (TDC) of compression, then install the **SST**.
2. Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the crank weight contacts **SST** and stops.)



am3uuw0000099

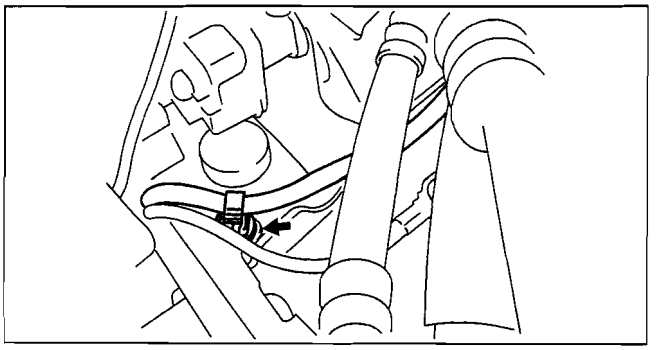
3. Install the **SST** to the crankshaft pulley and lock the crankshaft against rotation.



ampjjw00001731

No.3 Engine Mount Removal Note

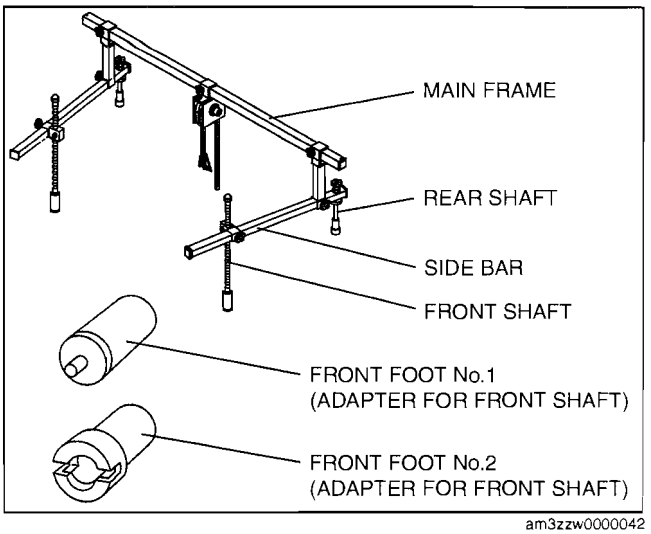
1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown in the figure.



am3zzw0000042

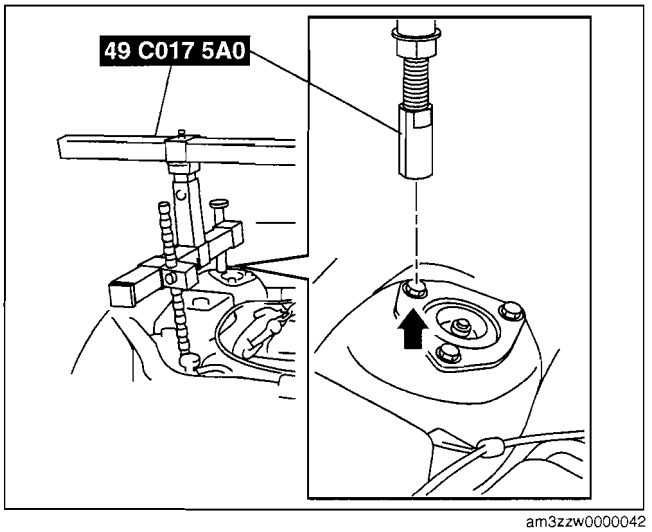
2. Install the **SST** using the following procedure.

Caution
- **Refer to the SST instruction manual for the basic handing procedure.**



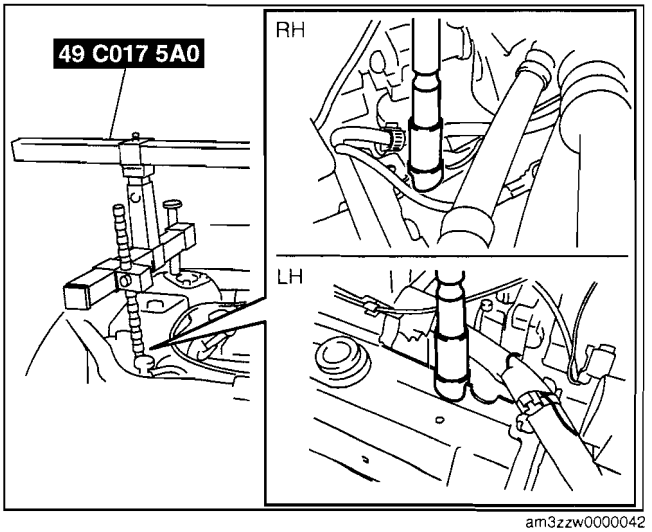
am3zzw0000042

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber (Identical position to right side).



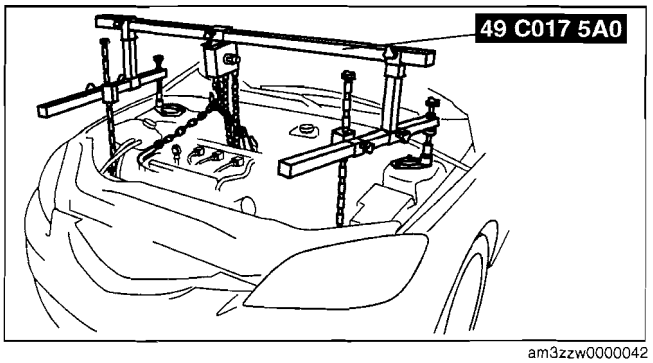
am3zzw0000042

(3) Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3zzw0000042

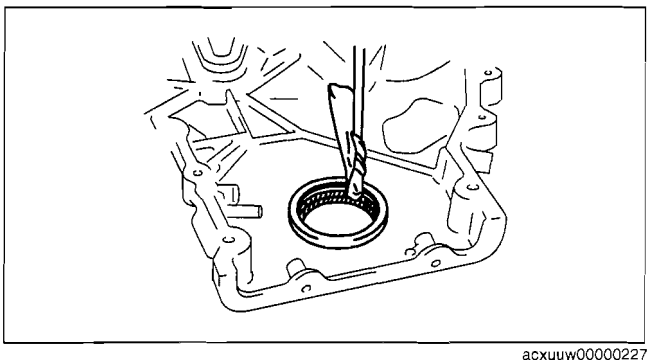
3. Support the engine using the **SST**.
4. Remove the battery tray bracket, No.4 engine mount rubber and bracket.



am3zzw0000042

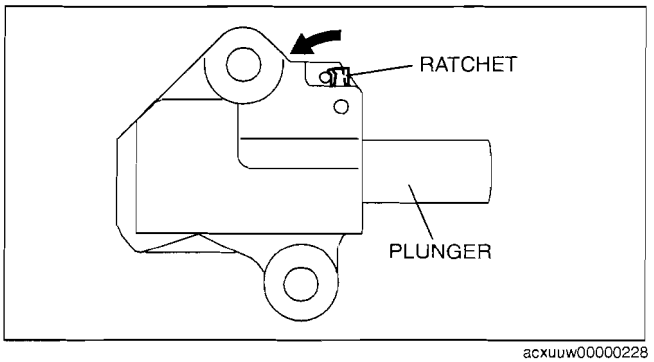
Front Oil Seal Removal Note

1. Remove the front oil seal using a flathead screwdriver or similar tool.


acxuuw00000227

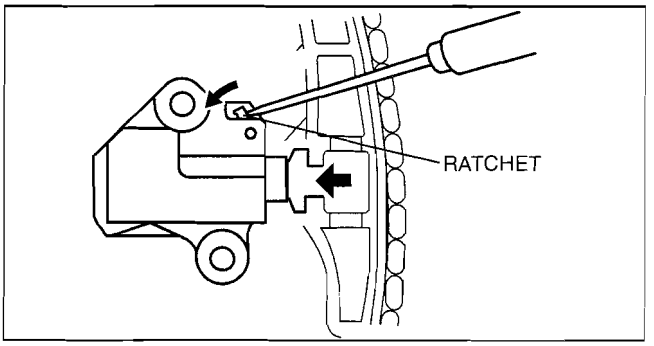
Chain Tensioner Removal Note

1. Press the timing chain tensioner ratchet to the left using a thin flathead screwdriver (precision screwdriver) to unlock the plunger.



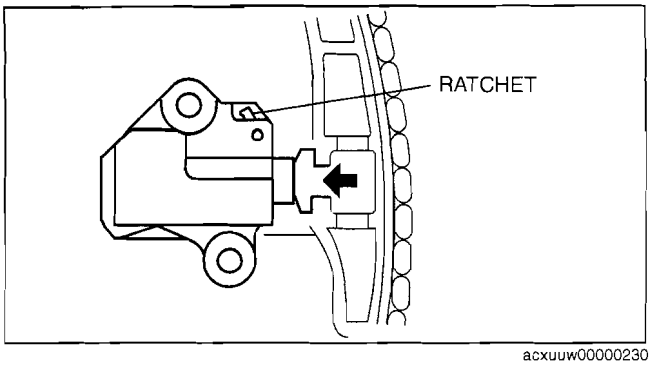
acxuuw00000228

2. Slowly press the plunger back in the direction shown in the figure while pressing the ratchet.



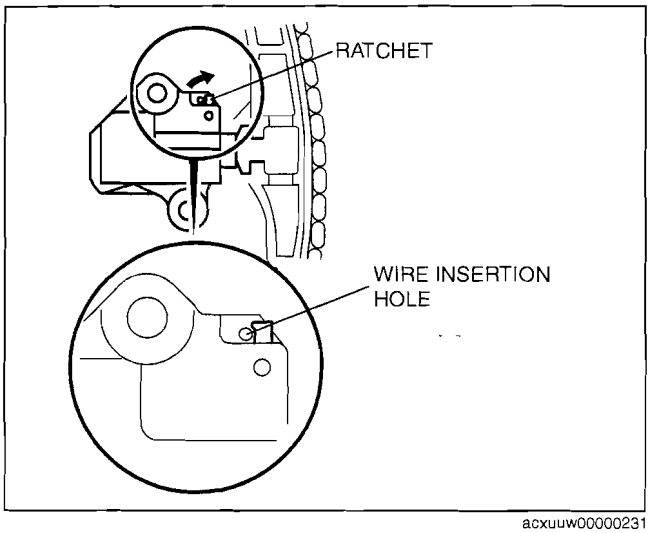
acxuuw00000229

3. Release the ratchet with the plunger still pressed down.



acxuuw00000230

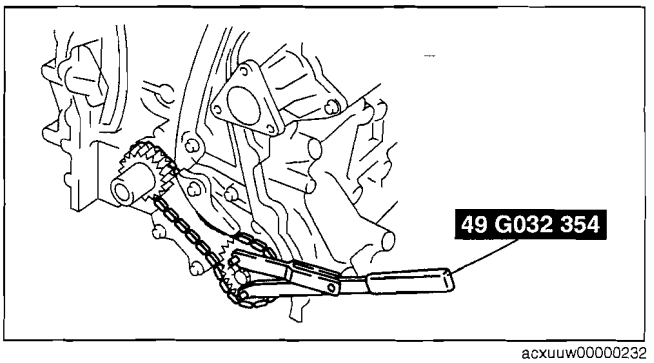
4. Press-in the plunger until the ratchet position is as indicated in the figure, and then insert the wire to lock the plunger.



acxuuw00000231

Oil Pump Driven Sprocket Removal Note

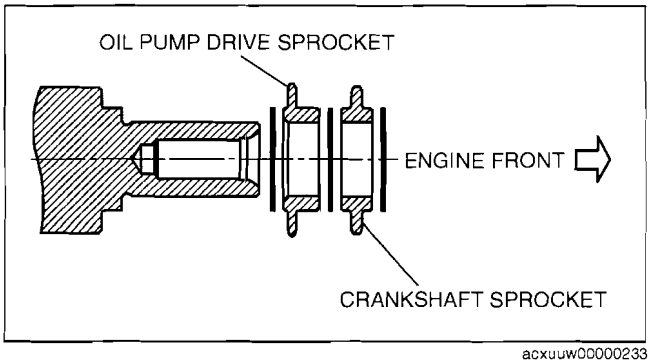
1. Install the **SSTs** to the oil pump driven sprocket, and lock it against rotation.



acxuuw00000232

Oil Pump Drive Sprocket Installation Note

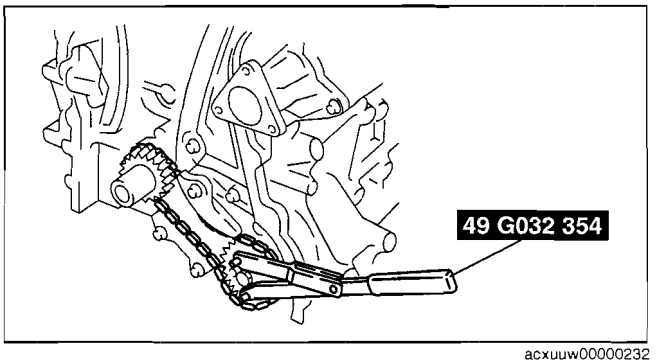
1. The oil pump drive sprocket has the assembly direction as shown in the figure.



acxuuw00000233

Oil Pump Driven Sprocket Installation Note

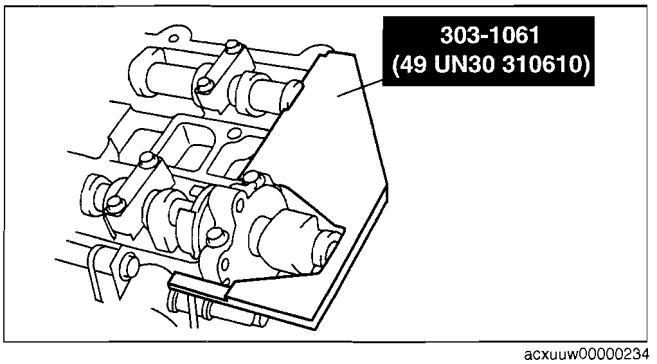
1. Install the **SST** to the oil pump driven sprocket and lock the oil pump against rotation.



acxuuw00000232

Timing Chain Installation Note

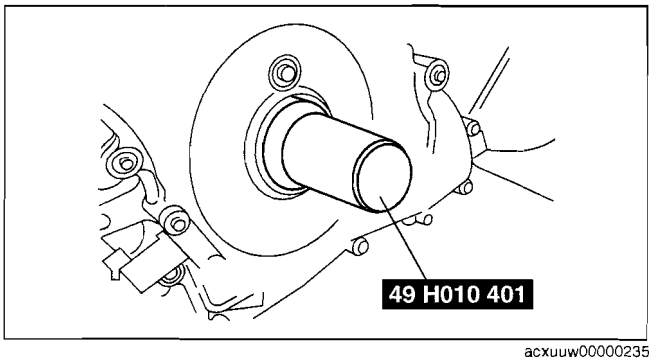
1. Install the **SST** to the camshaft as shown in the figure.
2. Install the timing chain.
3. Remove the wire or paper clip from the chain tensioner piston and apply tension to the timing chain.



acxuuw00000234

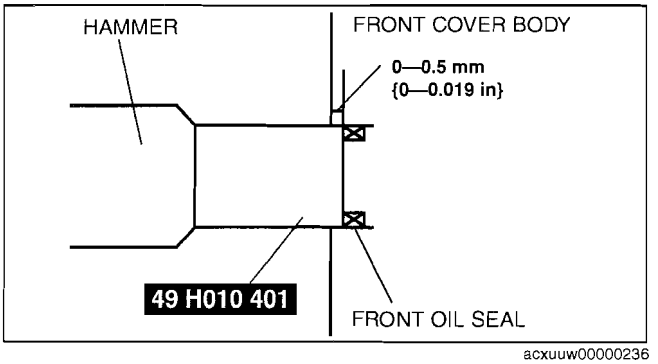
Front Oil Seal Installation Note

1. Apply clean engine oil to a new front oil seal.
2. Push the front oil seal in the engine front cover by hand.
3. Use the **SST** to tap in the front oil seal.



acxuuw00000235

Front oil seal press-in amount
0—0.5 mm {0—0.019 in}



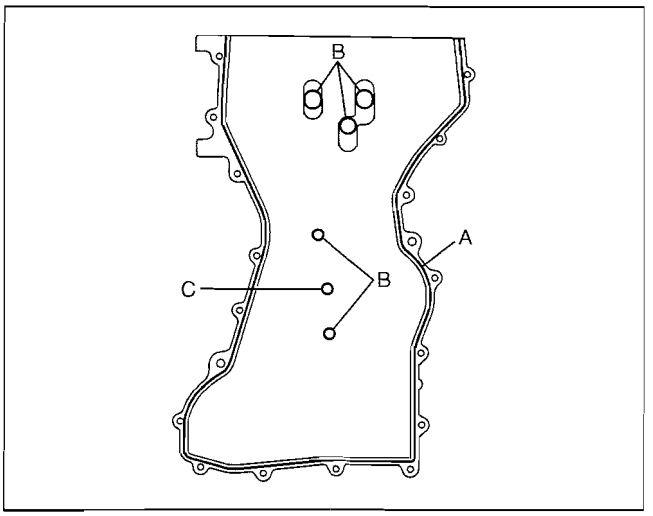
acxuuw00000236

Engine Front Cover Installation Note

1. Apply silicone sealant to the engine front cover.

Caution
- **Install the engine front cover within 10 min of applying the silicone sealant.**
- **Silicone sealant is not needed in area C shown in the figure.**

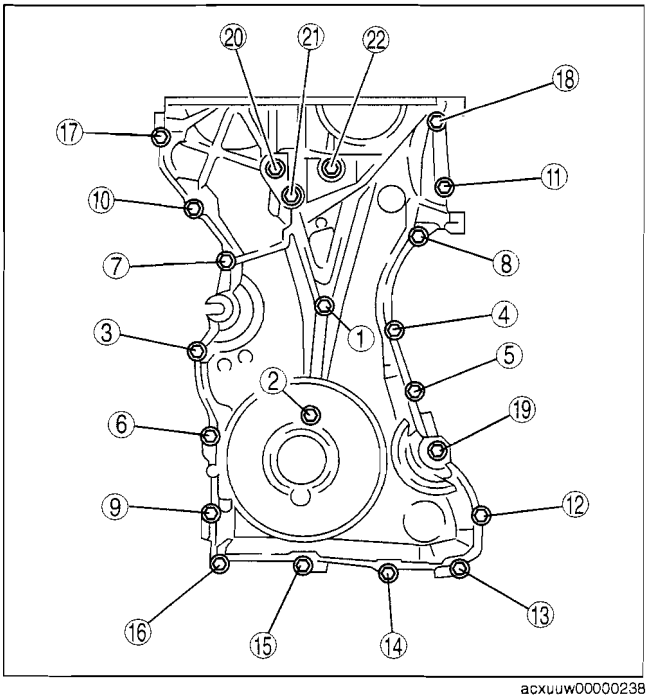
Thickness
A: 2.2—3.2 mm {0.087—0.12 in}
B: 1.5—2.5 mm {0.06—0.098 in}



acxuuw00000237

2. Tighten the engine front cover installation bolts in the order shown in the figure.

Installation Position	Tightening Torque
1—18	8.0—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}
19—22	40—55 N·m {4.1—5.6 kgf·m, 30—40 ft·lbf}



acxuuw00000238

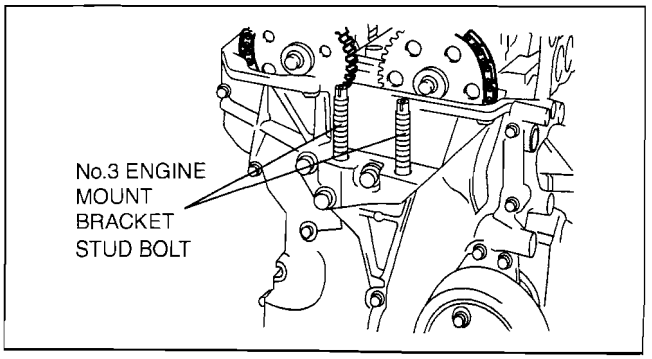
No.3 Engine Mount Installation Note

1. Tighten the stud bolt of the No.3 engine mount bracket.

Tightening torque
7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}

Note
- Tightening stud bolt when the nut of No.3 engine mount nut is loosened.

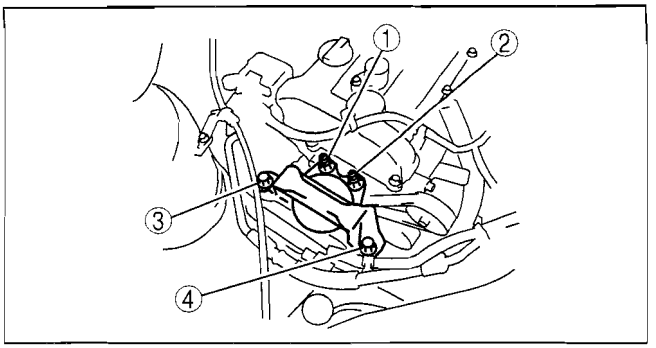
2. Hand-tighten the No.3 engine mount rubber and No.3 engine mount bracket.



am3zzw0000244

3. Tighten the bolts and nuts in the order as shown in the figure.

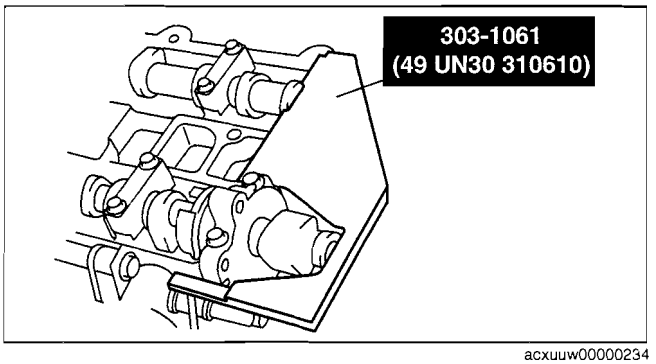
   Tightening torque
   74.5—104.9 {7.6—10.6 kgf·m, 55.0—77.3 ft·lbf}



am3zzw0000244

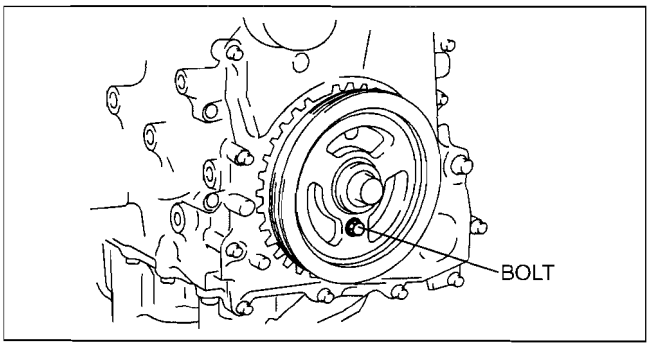
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown in the figure.
2. Verify that cylinder No.1 is at TDC of the compression stroke. (Position crank weight contacts **SST**.)



acxuuw00000234

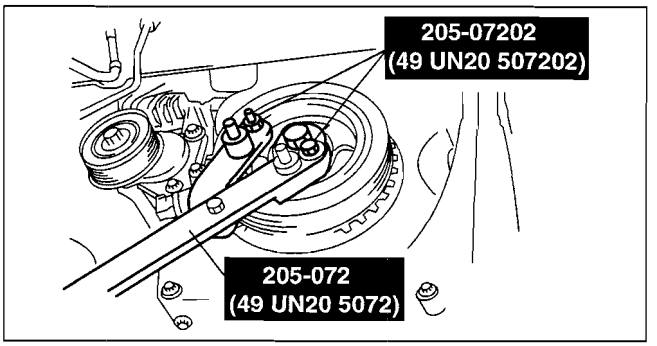
3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 X 1.0 length 25—35 mm {0.99—1.3 in}**), fix the crankshaft pulley to the engine front cover.



acxuuw00000243

4. Install the**SSTs** to the crankshaft pulley, lock the crankshaft against rotation, and tighten the crankshaft pulley lock bolt using the following two steps.

   Tightening procedure
   1st step: 96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}
   2nd step: 87°—93°

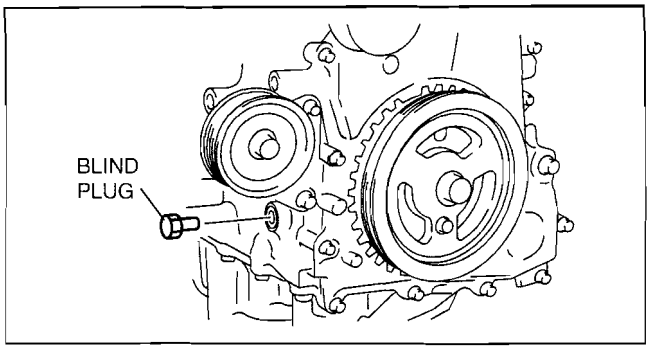


ampjjw00001731

5. Remove the bolt (**M6 X 1.0 length 25—35 mm {0.99—1.3 in}**) installed to the crankshaft pulley.
6. Remove the **SST** from the camshaft.
7. Remove the **SST** installed in the cylinder block lower blind plug hole.
8. Rotate the crankshaft clockwise two turns and inspect the valve timing.
   - If not aligned, repeat from Step 1.

9. Install the cylinder block lower blind plug.

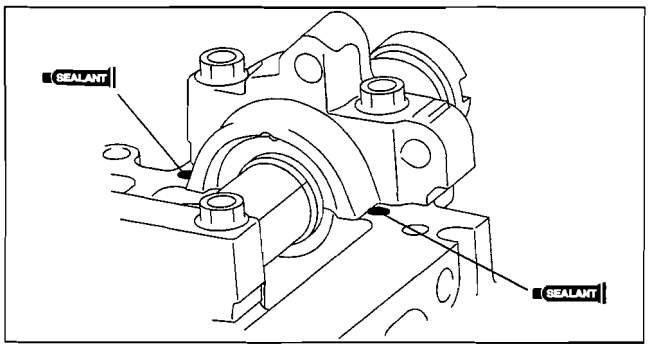
Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}



acxuuw00000244

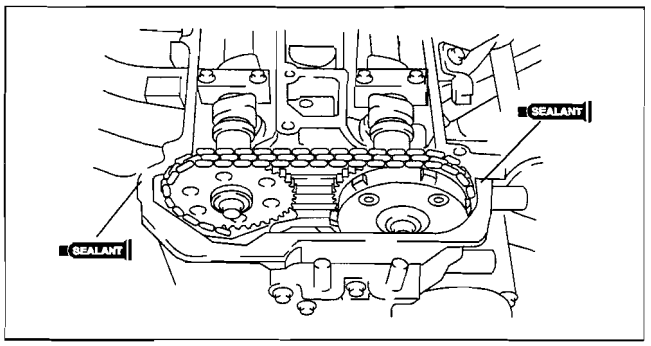
Cylinder Head Cover Installation Note

1. Apply silicone sealant to the areas shown in the figure.



acxuuw00000245

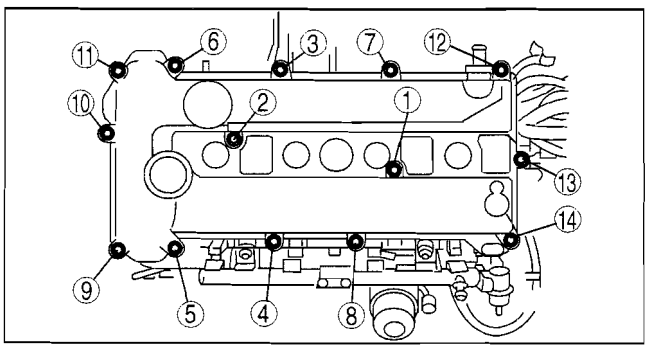
Thickness
5.0 mm {0.20 in}



acxuuw00000246

2. Tighten the cylinder head cover bolts in the order shown in the figure.

Tightening torque
8.0—10.5 N·m {82—107 kgf·cm, 71—92 in·lbf}



acxuuw00000247

CYLINDER HEAD GASKET REPLACEMENT[L3 WITH TC]

id011039800700

Warning

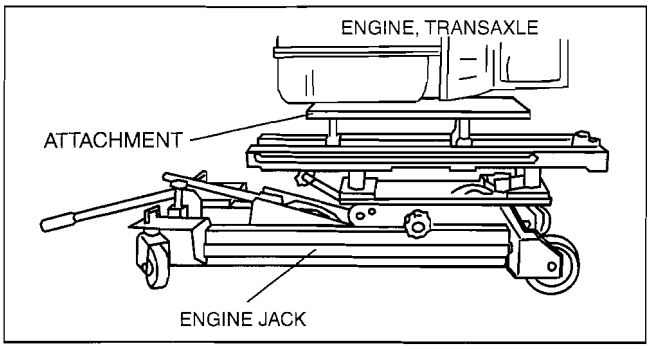
- **Fuel vapor is hazardous. It can very easily ignite, causing death, serious injury, or damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can easily ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always perform the Fuel Line Safety Procedure. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)**

1. Remove the timing chain. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the generator. (See 01-17B-6 GENERATOR REMOVAL/INSTALLATION[L3 WITH TC].)

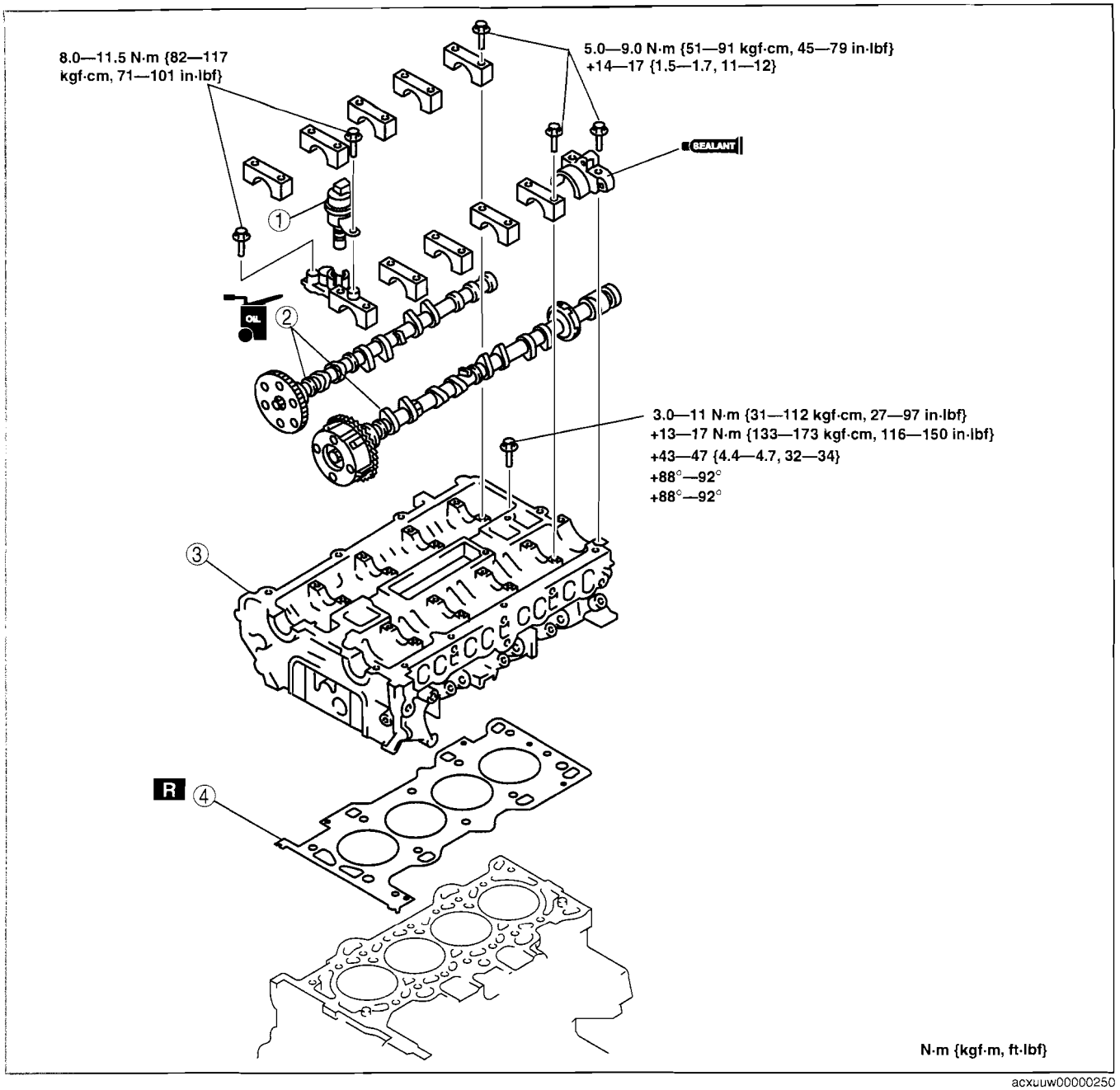
Note

- Place the generator out of the way with the wiring harnesses connected.

3. Remove the exhaust manifold. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the intake manifold. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Disconnect the heater hose and radiator hose.
6. Disconnect the wiring harness.
7. To firmly support the engine, first set the engine jack and attachment to the oil pan.
8. Remove in the order indicated in the figure.
9. Install in the reverse order of removal.
10. Bleed the air from the cooling system. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
11. Inspect the compression pressure. (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].)



acxuuw00000249



acxuuw00000250

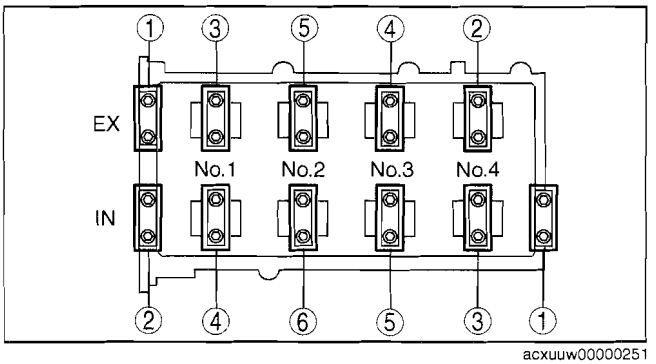
1	OCV
2	Camshaft (See01-10B-22 Camshaft Removal Note.) (See01-10B-23 Camshaft Installation Note.)

3	Cylinder head (See01-10B-22 Cylinder Head Removal Note.) (See01-10B-22 Cylinder Head Installation Note.)
4	Cylinder head gasket

Camshaft Removal Note

Note
- The camshaft caps are to be kept ordered for correct reassembly in their original positions.

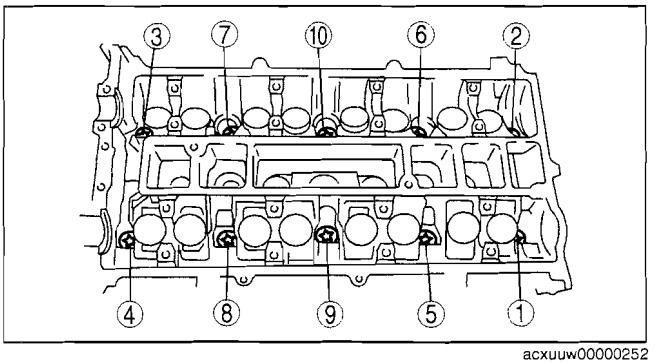
1. Loosen the camshaft cap bolts in two or three passes in the order shown, and remove them.



acxuuw00000251

Cylinder Head Removal Note

1. Loosen the cylinder head installation bolts in two to three passes in the order shown in the figure and remove them.

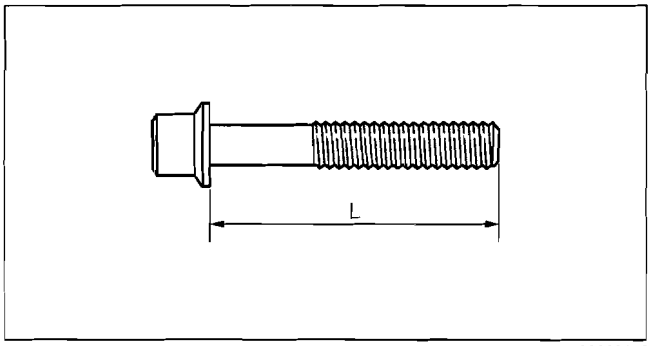


acxuuw00000252

Cylinder Head Installation Note

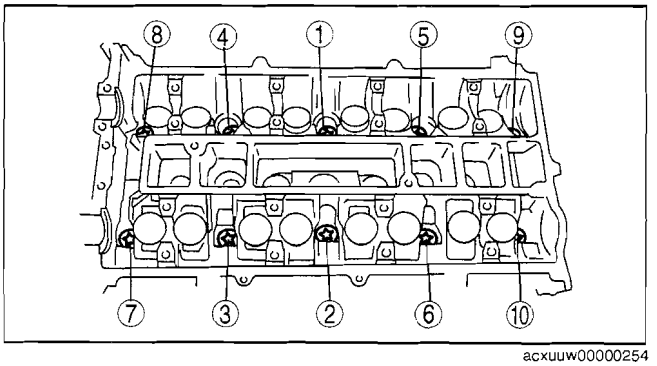
1. Measure the length of each cylinder head bolt.
   - Replace any cylinder head bolts that exceed the maximum length.

Cylinder head bolt length
Standard: 144.7—145.3 mm {5.697—5.720 in}
Maximum: 146 mm {5.74 in}



acxuuw00000253

Tightening procedure
1st step: 3.0—11 N·m {31—112 kgf·cm, 27—97 in·lbf}
2nd step: 13—17 N·m {133—173 kgf·cm, 116—150 in·lbf}
3rd step: 43—47 N·m {4.4—4.7 kgf·m, 32—34 ft·lbf}
4th step: 88°—92°
5th step: 88°—92°

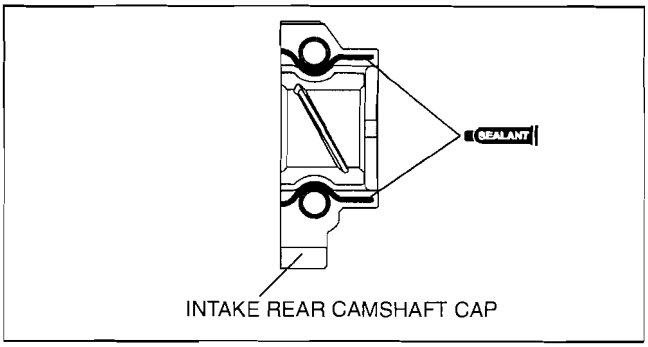


acxuuw00000254

Camshaft Installation Note

1. Install the camshaft with No.3 cylinder cam aligned at TDC of compression stroke.
2. Carefully apply adhesive agent to the area indicated in the figure so that it does not leak into the sliding part.

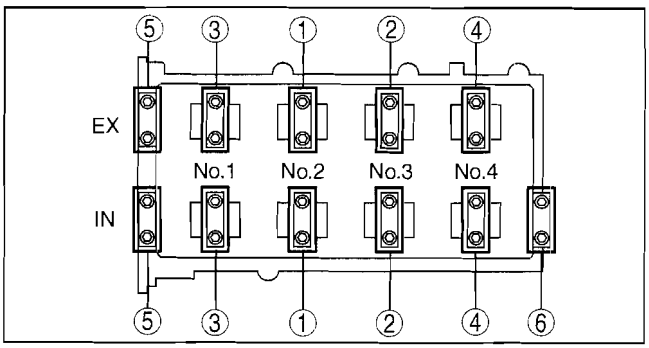
   Thickness
   1.0 mm {0.039 in}



acxuuw00000255

3. Install the camshaft caps and temporarily tighten the camshaft cap bolts evenly in two or three passes, and then tighten the camshaft cap bolts using the following two steps, in the order shown in the figure.

   Tightening procedure
   1st step: 5.0—9.0 N·m {51—91 kgf·cm, 45—79 in·lbf}
   2nd step: 14—17 N·m {1.5—1.7 kgf·m, 11—12 ft·lbf}

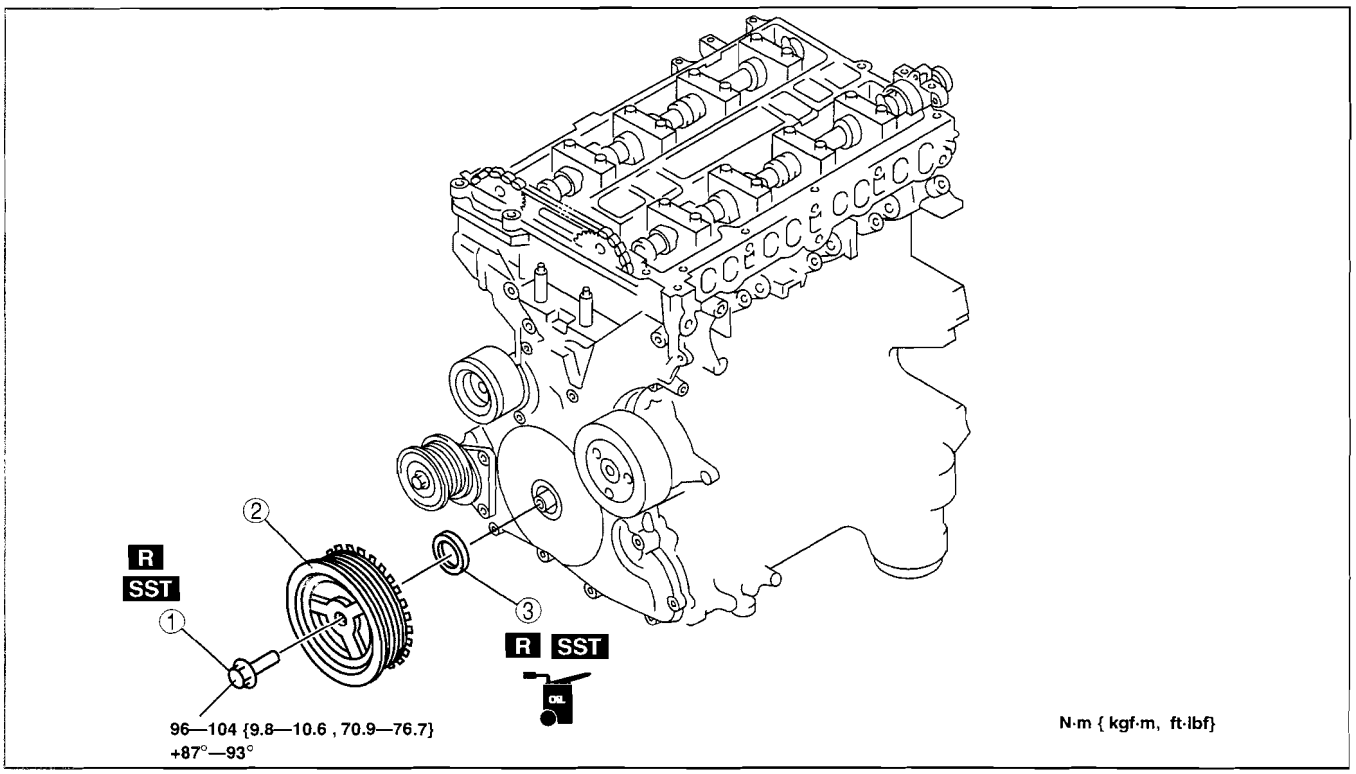


acxuuw00000256

FRONT OIL SEAL REPLACEMENT[L3 WITH TC]

id011039800800

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
8. Disconnect the wiring harness.
9. Remove the ventilation hose.
10. Remove cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
11. Remove the crankshaft position (CKP) sensor. (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
12. Remove in the order indicated in the figure.
13. Install in the reverse order of removal.

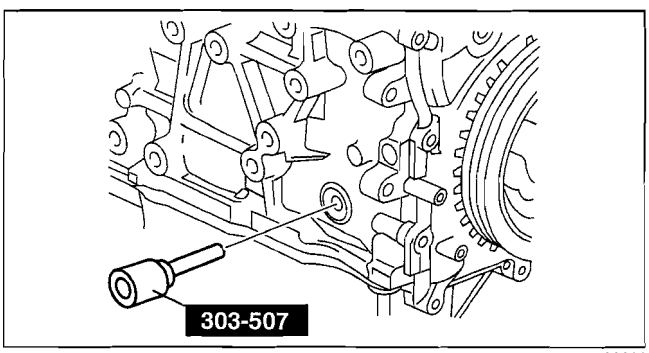


acxuuw00000196

1	Crankshaft pulley lock bolt (See01-10B-24 Crankshaft Pulley Lock Bolt Removal Note.) (See01-10B-26 Crankshaft Pulley Lock Bolt Installation Note.)
2	Crankshaft pulley
3	Front oil seal (See01-10B-25 Front Oil Seal Removal Note.) (See01-10B-25 Front Oil Seal Installation Note.)

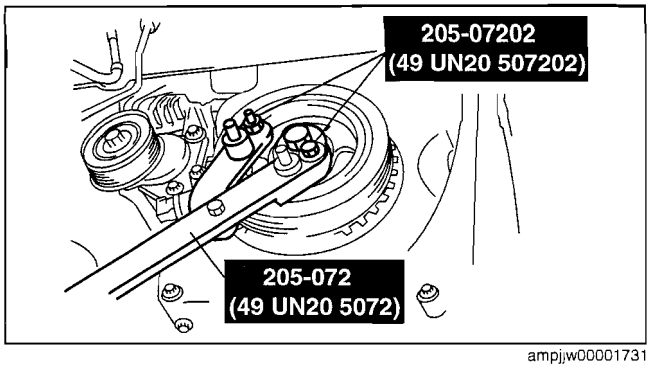
Crankshaft Pulley Lock Bolt Removal Note

1. Rotate the crankshaft in the direction of the engine rotation and remove the cylinder block lower blind plug when the No. 1 cylinder is at the point prior to top dead center (TDC) of compression, then install the **SST**.
2. Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the crank weight contacts **SST** and stops.)



am3uuw0000099

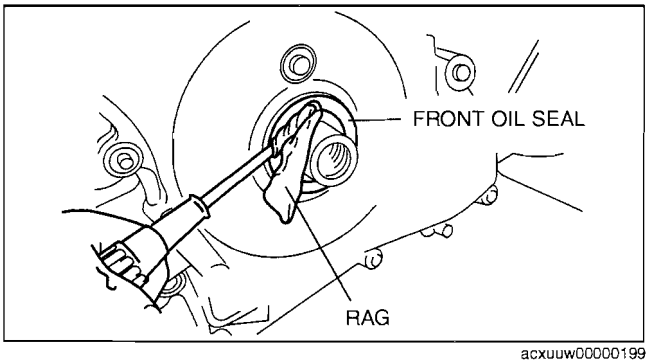
3. Install the **SSTs** to the crankshaft pulley and lock the crankshaft against rotation.



ampjjw00001731

Front Oil Seal Removal Note

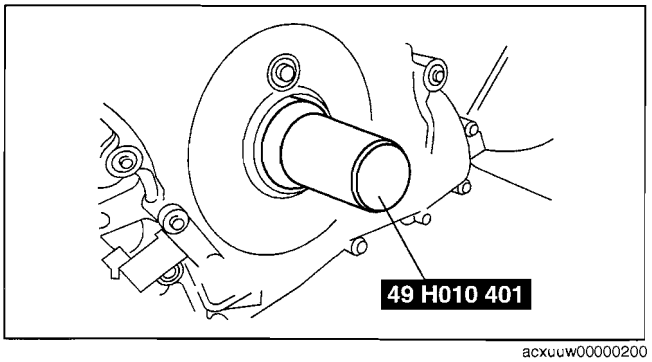
1. Remove the oil seal lip using a razor.
2. Remove the oil seal using a flathead screwdriver with the tip protected by a rag to prevent crankshaft oil seal damage.



acxuuw00000199

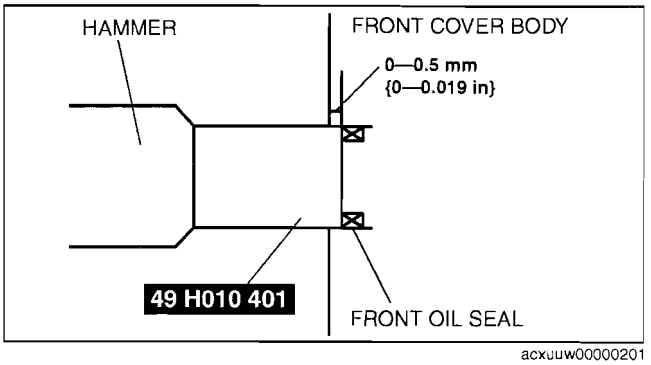
Front Oil Seal Installation Note

1. Apply clean engine oil to a new oil seal.
2. Insert the oil seal into the engine front cover.
3. Tap in the oil seal using the **SST.**



acxuuw00000200

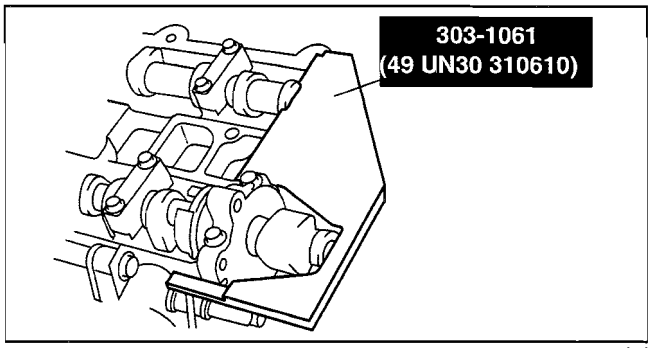
Front oil seal press-in amount
0—0.5 mm {0—0.019 in}



acxuuw00000201

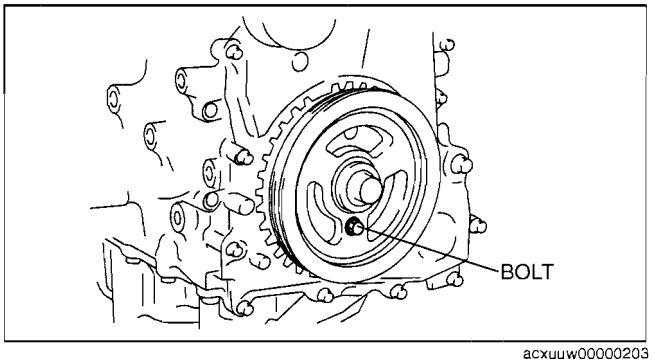
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown in the figure.
2. Verify that cylinder No.1 is at TDC of the compression stroke. (Position crank weight contacts **SST**.)



acxuuw00000202

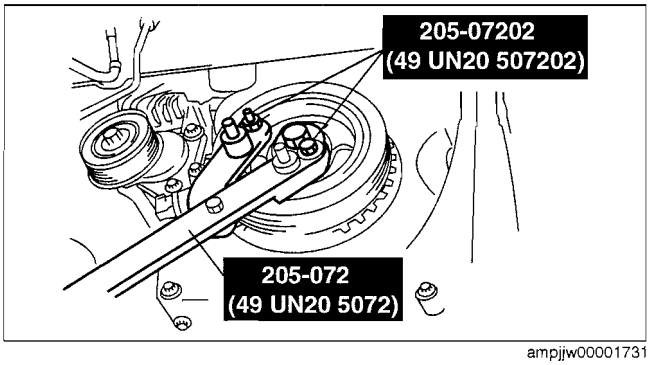
3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 x 1.0**), fix the crankshaft pulley to the engine front cover.



acxuuw00000203

4. Install the **SSTs** to the crankshaft pulley and lock the crankshaft against rotation, and tighten the crankshaft pulley lock bolt using the following two steps.

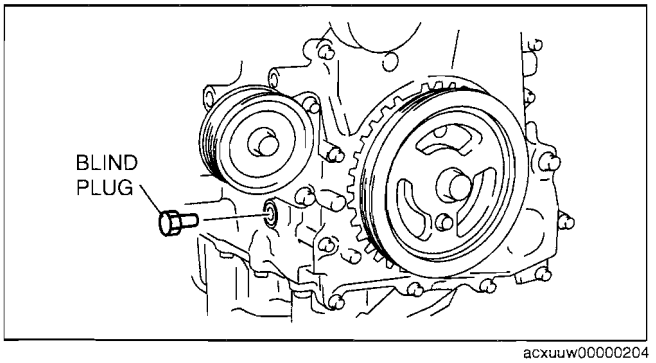
   Tightening procedure
   1st step: 96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}
   2nd step: 87°—93°



ampjjw00001731

5. Remove the crankshaft pulley installation bolt **(M6 X 1.0)**.
6. Remove the SST from the camshaft.
7. Remove the SST installed in the cylinder block lower blind plug hole.
8. Rotate the crankshaft clockwise two turns and inspect the valve timing.
   - If not aligned, repeat from Step 1.
9. Install the cylinder block lower blind plug.

   Tightening torque
   18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}



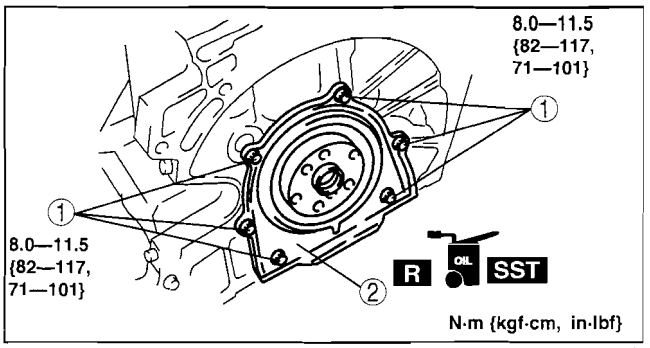
acxuuw00000204

REAR OIL SEAL REPLACEMENT[L3 WITH TC]

id011039800900

1. Remove the flywheel.
2. Remove in the order indicated in the figure.
3. Install in the reverse order of removal.

1	Bolt
2	Rear oil seal (See01-10B-27 Rear Oil Seal Installation Note.)



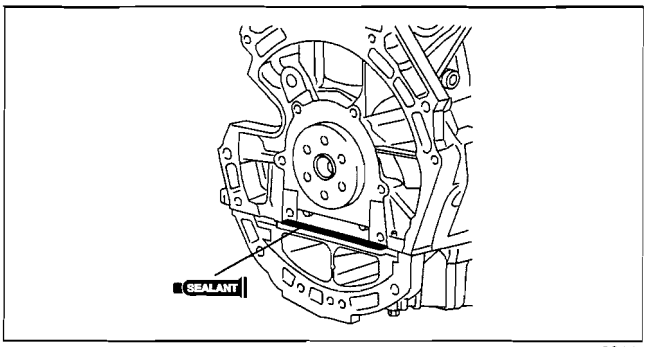
acxuuw00000146

Rear Oil Seal Installation Note

1. Apply silicone sealant to the areas shown in the figure.

Caution
- **Install the rear oil seal within 10 min of applying the silicone sealant.**

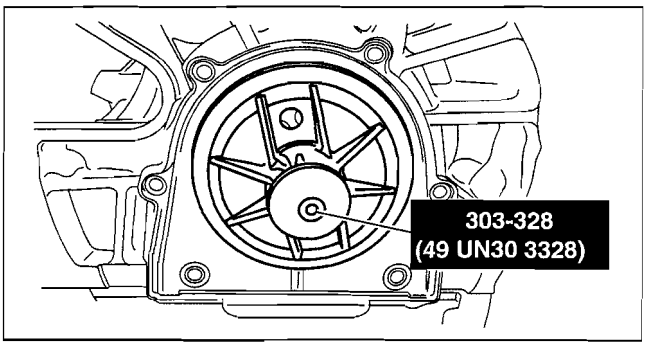
Thickness
4.0—6.0 mm {0.16—0.23 in}



acxuuw00000147

2. Apply clean engine oil to a new rear oil seal.

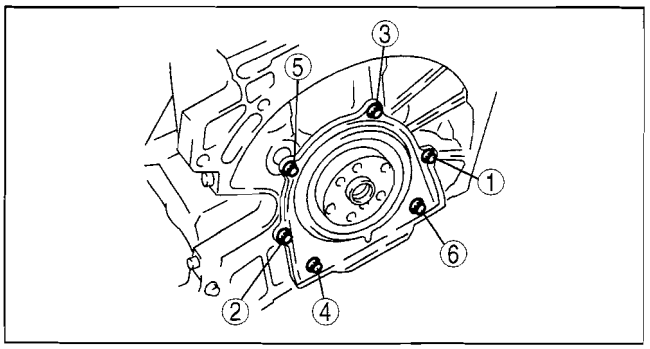
3. Install the rear oil seal using a **SST.**



acxuuw00000148

4. Tighten the rear oil seal installation bolts in the order shown in the figure.

Tightening torque
8.0—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}



acxuuw00000149

ENGINE REMOVAL/INSTALLATION[L3 WITH TC]

id011039800400

Warning

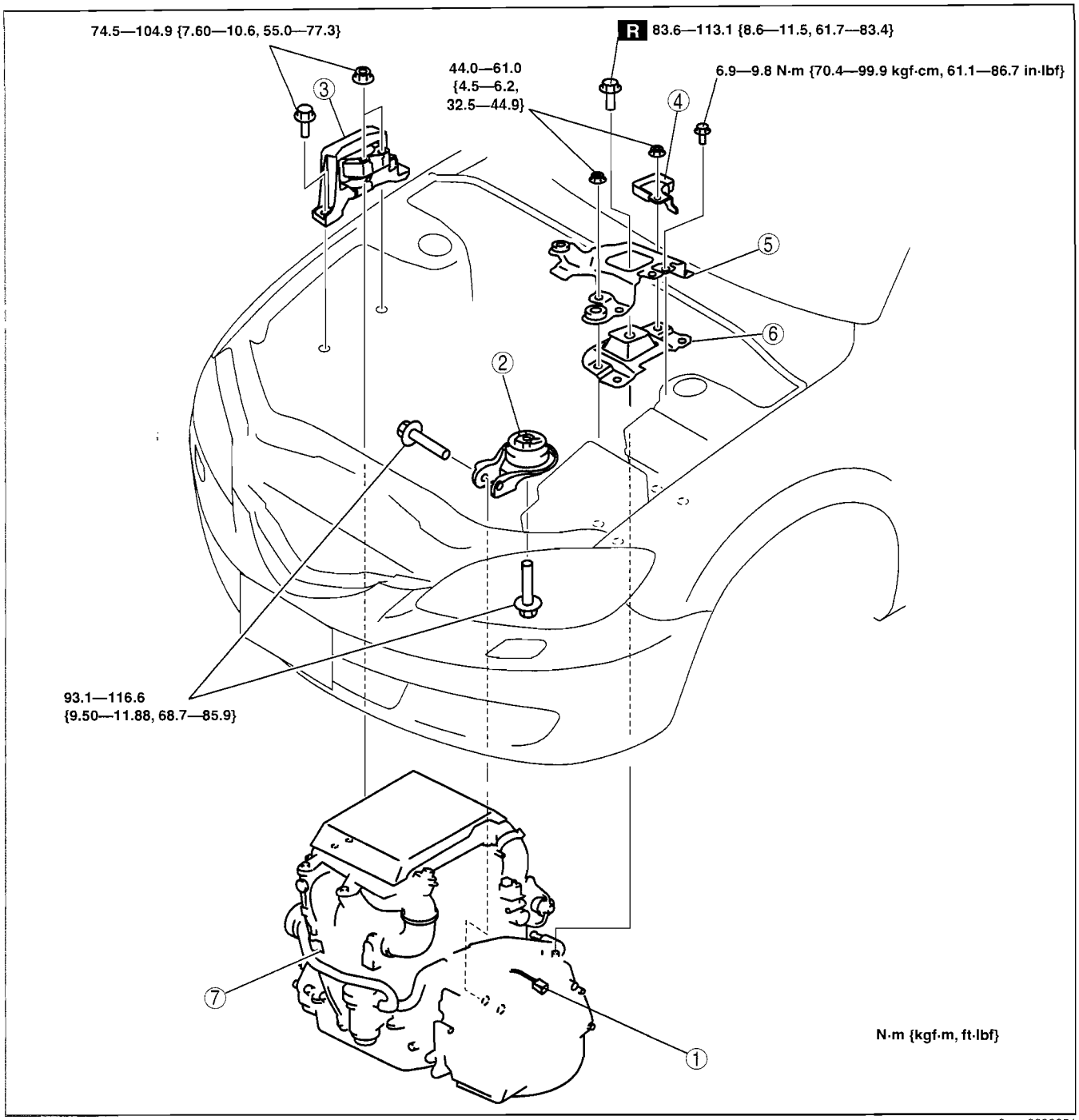
- **Fuel vapor is hazardous. It can very easily ignite, causing death, serious injury, or damage. Always keep sparks and flames away from fuel.'**
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can easily ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always perform the Fuel Line Safety Procedure. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)**

1. Remove the battery and battery tray. (See 01-17B-4 BATTERY INSPECTION[L3 WITH TC].)
2. Remove the front tire.
3. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the air cleaner. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the under cover, splash shield and mudguard.
6. Drain the engine coolant (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
7. Drain the transaxle oil. (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R].)
8. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
9. Remove the tunnel member. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
10. Remove the member. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
11. Remove the TWC. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
12. Remove the insulator. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
13. Remove the WU-TWC. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
14. Disconnect the heater hose. (See 07-11-3 A/C UNIT REMOVAL/INSTALLATION.)
15. Disconnect the radiator hose. (See 01-12B-7 RADIATOR REMOVAL/INSTALLATION[L3 WITH TC].)
16. Disconnect the brake vacuum hose. (See 04-11-4 VACUUM HOSE REMOVAL/INSTALLATION.)
17. Disconnect the fuel hose and vacuum hose. (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
18. Disconnect the shift cable. (See 05-15B-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[A26M-R].)
19. Disconnect the clutch release cylinder with the pipe. (See 05-10-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.)
20. Disconnect the wiring harnesses.
21. Disconnect the front drive shaft (RH) from the joint shaft side. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.)
22. Disconnect the front drive shaft (LH) from the transaxle side. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.)
23. Remove the A/C compressor with the pipes still connected. (See 07-11-16 A/C COMPRESSOR REMOVAL/INSTALLATION[L3 WITH TC].)

Note

- Position and secure the A/C compressor out of the way with rope.

24. Remove the front crossmember, lower arm, front stabilizer, and steering gear and linkage as a single unit. (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
25. Remove in the order indicated in the figure.
26. Install in the reverse order of removal.
27. Start the engine, and inspect and adjust the following:
    - Air bleeding (See 06-14-4 AIR BLEEDING.)
    - Front wheel alignment (See 02-11-2 FRONT WHEEL ALIGNMENT.)
    - Bleed the air from the cooling system. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
    - Runout and contact on pulley and belt
    - Leakage of engine oil, engine coolant, automatic transmission fluid, or fuel.
    - Ignition timing, idle speed and idle mixture (CO and HC)
    - Engine accessories operation
28. Perform a road test and verify that there is no abnormal vibration or noise.



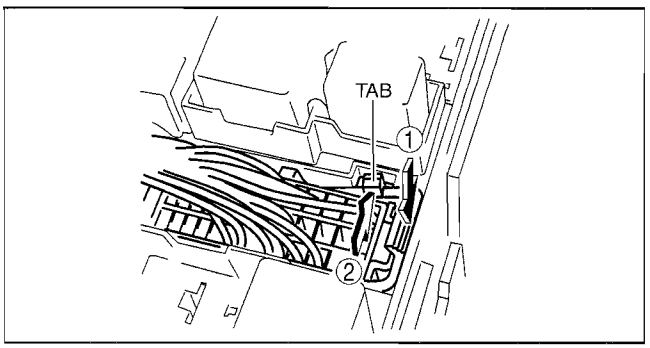
am3zzw0000351

1	Main fuse block connector (See 01-10B-30 Main Fuse Block Connector Removal Note.)
2	No.1 engine mount rubber (See 01-10B-31 No.1 Engine Mount Rubber Installation Note.)
3	No.3 Engine mount (See 01-10B-30 No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note.) (See 01-10B-30 No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note.)
4	Dynamic damper (if equipped)

5	Battery bracket
6	No.4 Engine mount rubber (See 01-10B-30 No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note.) (See 01-10B-30 No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note.)
7	Engine, transaxle

Main Fuse Block Connector Removal Note

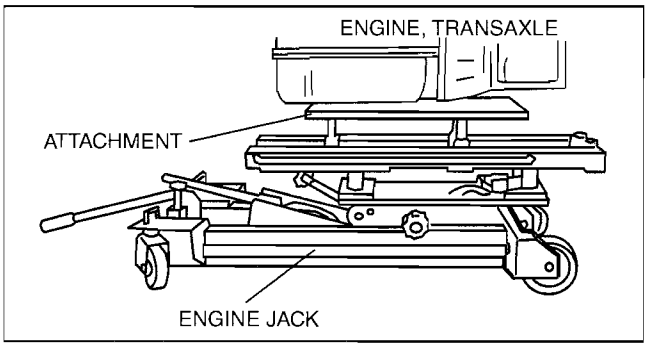
1. Release the tab in the order shown in the figure.
2. Pull the lock lever up and remove the connector.



am3zzw0000247

No.3 Engine Mount and No.4 Engine Mount Rubber Removal Note

1. Secure the engine and the transaxle using an engine jack and attachment as shown in the figure.



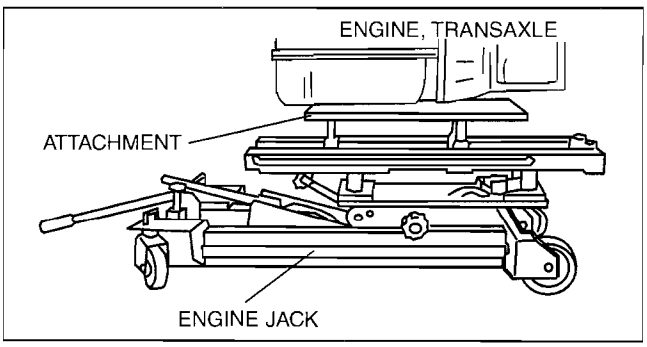
am3zzw0000247

No.3 Engine Mount and No.4 Engine Mount Rubber Installation Note

1. Secure the engine and the transaxle using an engine jack and attachment as shown in the figure.
2. Install the No.1 engine mount rubber and No.4 engine mount rubber.

Note

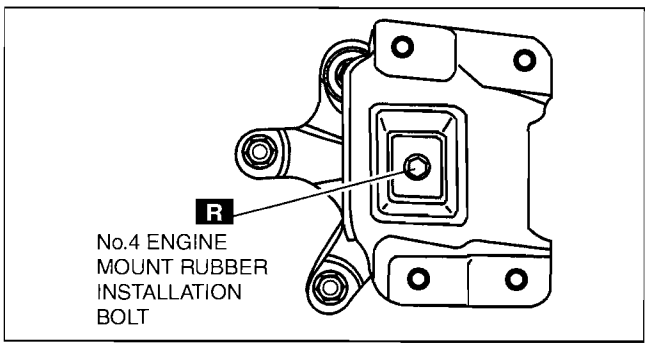
- Do not tighten the bolt and nut for the No.1 engine mount rubber and No.4 engine mount rubber during this step.



am3zzw0000247

3. Tighten the new No.4 engine mount rubber installation bolt as shown in the figure.

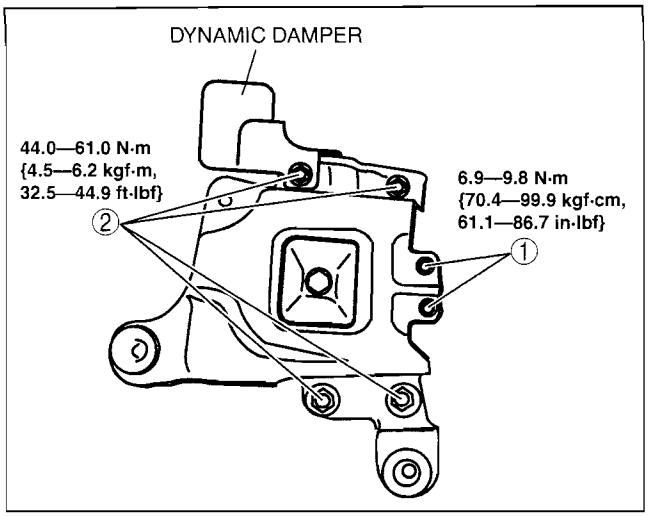
Tightening torque
83.6—113.1 N·m {8.6—11.5 kgf·m, 61.7—83.4 ft·lbf}



am3zzw0000247

4. Tighten the No.4 engine mount rubber and battery bracket bolts and nuts in the order as shown in the figure.

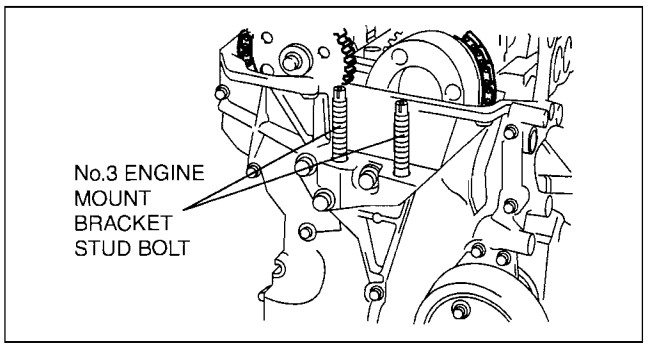
Tightening torque
1st step: 6.9—9.8 N·m {70.4—99.9 kgf·cm, 61.1—86.7 in·lbf}
2nd step: 44.0—61.0 N·m {4.5—6.2 kgf·m, 32.5—44.9 ft·lbf}



am3zzw0000247

5. Tighten the No.3 engine mount bracket stud bolts.

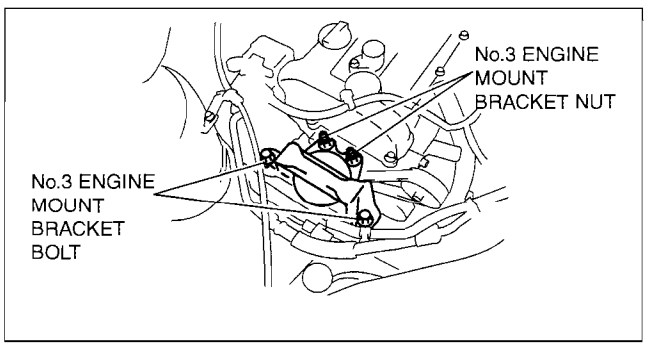
Tightening torque
7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}



am3zzw0000247

6. Tighten the No.3 engine mount bracket bolts and nuts in the order as shown in the figure.

Tightening torque
74.5—104.9 N·m {7.60—10.6 kgf·m, 55.0—77.3 ft·lbf}



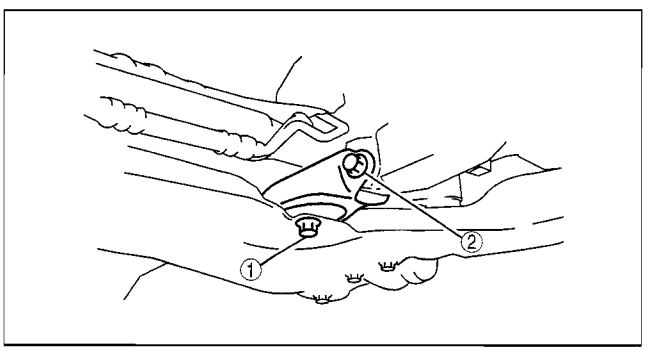
am3zzw0000247

No.1 Engine Mount Rubber Installation Note

1. Remove the engine jack and attachment.
2. Tighten the No.1 engine mount rubber installation bolts as shown in the figure.

Caution
- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**

Tightening torque
93.1—116.6 N·m {9.50—11.88 kgf·m, 68.7—85.9 ft·lbf}



am3zzw0000247

ENGINE DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id011039800500

1. Remove the engine from the transaxle.
2. Remove the intake-air system. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the exhaust system. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the generator. (See 01-17B-6 GENERATOR REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the starter. (See 01-19B-2 STARTER REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the crankshaft position (CKP) sensor. (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
7. Install in the reverse order of removal.

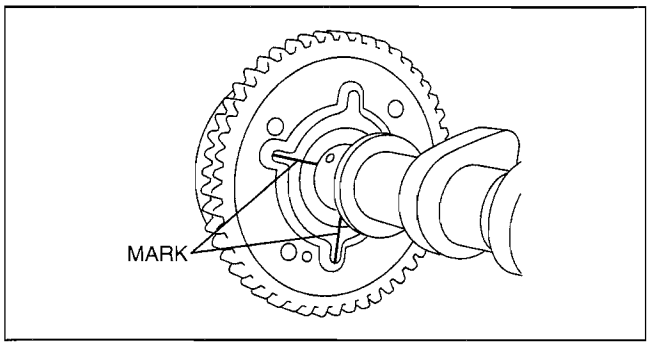
VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION[L3 WITH TC]

id011039801100

Caution
- **Remove the variable valve timing actuator and camshaft sprocket as a single unit.**

Note
- The variable valve timing actuator and camshaft sprocket cannot be disassembled.

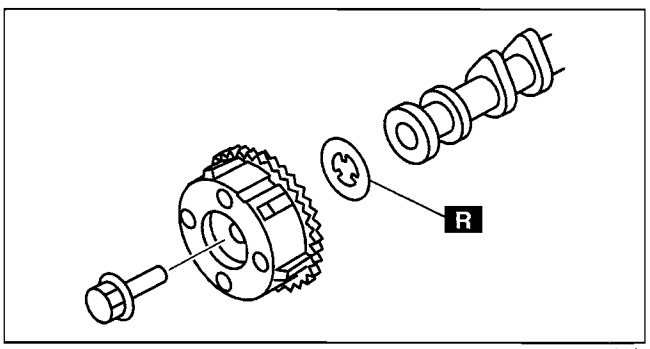
1. Referring to the valve clearance adjustment procedure, remove the variable valve timing actuator and the camshaft on the intake air side as a single unit. (See 01-10B-4 VALVE CLEARANCE INSPECTION/ ADJUSTMENT[L3 WITH TC].)
2. Remove the variable valve timing actuator.
   (1) Place alignment marks on the camshaft and variable valve timing actuator as shown in the figure so that the variable valve timing actuator is re-assembled in its original position.
   (2) Fix the camshaft in a vise.
   (3) Loosen the variable valve timing actuator installation bolt.



acxuuw00000144

3. Install a new washer.
4. Install the variable valve timing actuator.
   (1) Fix the camshaft in a vise.
   (2) Align the marks on the camshaft and the variable valve timing actuator.

Caution
- **If replacing with a new variable valve timing actuator, place alignment marks in the same positions as those prior to the replacement.**



acxuuw00000145

   (3) Tighten the variable valve timing actuator installation bolt.

Tightening torque
69—75 N·m {7.1—7.6 kgf·m, 51—55 ft·lbf}

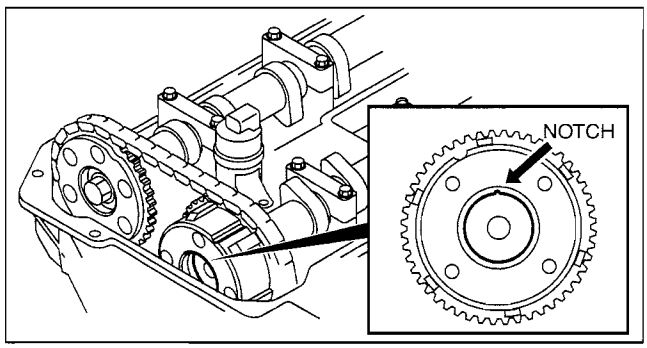
5. Referring to the valve clearance adjustment procedure, install the variable valve timing actuator and camshaft on the intake air side as a single unit. (See 01-10B-4 VALVE CLEARANCE INSPECTION/ADJUSTMENT[L3 WITH TC].)

VARIABLE VALVE TIMING ACTUATOR INSPECTION[L3 WITH TC]

id011039801200

Caution
- **Due to the precision interior construction of the variable valve timing actuator, it cannot be disassembled.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the spark plugs. (See 01-18B-3 SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC].)
6. Disconnect the wiring harness.
7. Remove the ventilation hose.
8. Remove cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
9. Verify that the groove of the rotor and notch of the cover on the variable valve timing actuator are aligned and fitted.
   - If they are not aligned, rotate the crankshaft in the direction of engine rotation two times and verify that they are aligned.
     — If they will not align, replace the variable valve timing actuator.
   - If under any condition, the variable valve timing actuator always makes a hitting noise directly after the camshaft exceeds maximum lift while rotating the crankshaft two times in the direction of engine rotation, replace the variable valve timing actuator as it has not been fixed.
10. install the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
11. install the ventilation hose.
12. Connect the wiring harness.
13. Install the spark plugs. (See 01-18B-3 SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC].)
14. Install the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
15. Install the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
16. Connect the negative battery cable.
17. Install the battery cover.



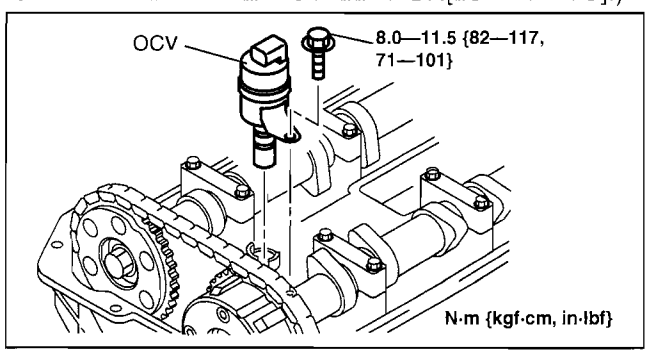
acxuuw00000143

OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[L3 WITH TC]

id011039801300

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
5. Disconnect the wiring harness.
6. Remove the ventilation hose.
7. Remove the cylinder head cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
8. Remove the OCV.
9. Install the OCV.

Tightening torque
8.0—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}



am3zzw0000352

OIL CONTROL VALVE (OCV) INSPECTION[L3 WITH TC]

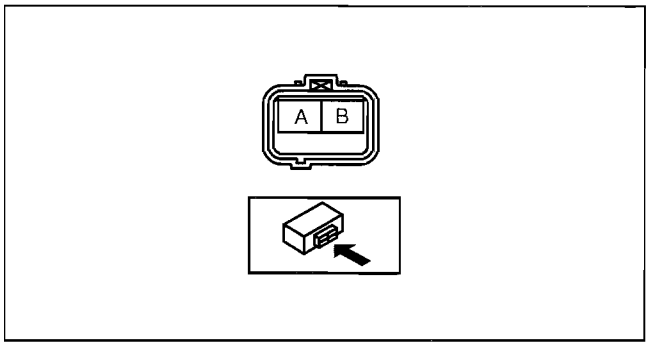
id011039801400

Coil Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Disconnect the OCV connector.
4. Measure the coil resistance between terminals A and B using a tester.
   - If it is not within the specification, replace the OCV.

   OCV resistance
   6.9—7.9 ohms [20°C {68°F}]

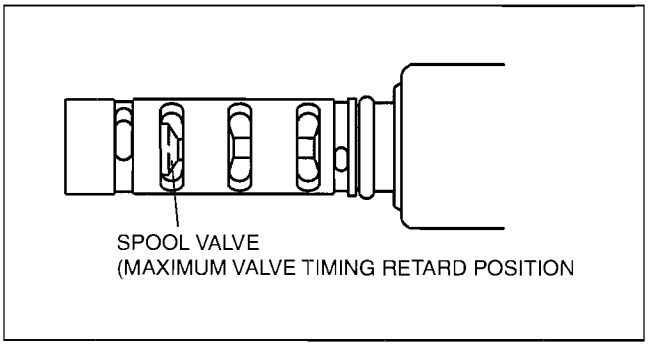
5. Connect the OCV connector.
6. Connect the negative battery cable.
7. Install the battery cover.



am3zzw0000352

Spool Valve Operation Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Disconnect the OCV connector.
4. Remove the OCV. (See 01-10B-33 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[L3 WITH TC].)
5. Verify that the spool valve in the OCV is in the maximum valve timing retard position as indicated in the figure.
   - If not as specified, replace the OCV.
6. Verify that the battery is fully charged.
   - If not as specified, recharge the battery.



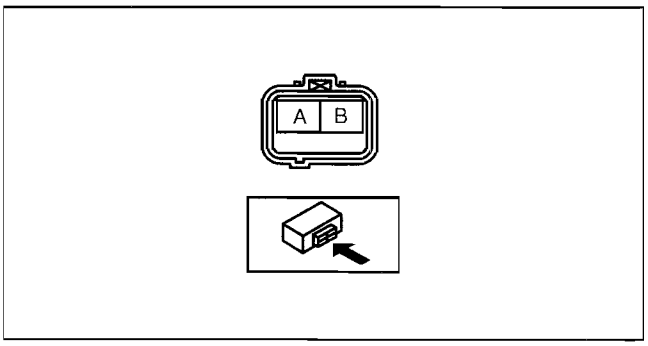
acxuuw00000140

7. Apply battery positive voltage between the OCV terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.
   - If not as specified, replace the OCV.

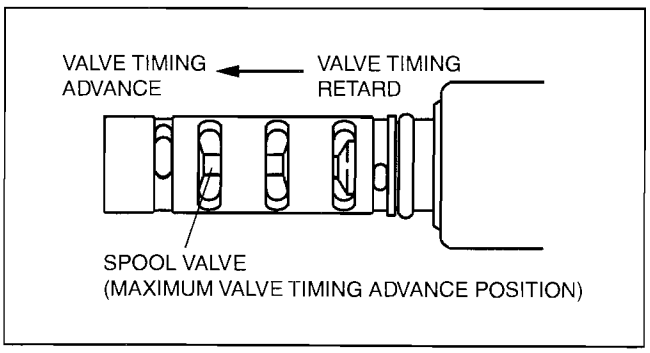
   Note
   - When applying battery positive voltage between the OCV terminals, the connection can be either of the following:
     — Positive battery cable to terminal A, Negative battery cable to terminal B

     — Positive battery cable to terminal B, Negative battery cable to terminal A

8. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.
   - If not as specified, replace the OCV. (See 01-10B-33 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION[L3 WITH TC].)
9. Connect the OCV connector.
10. Connect the negative battery cable.
11. Install the battery cover.



am3zzw0000352



acxuuw00000142

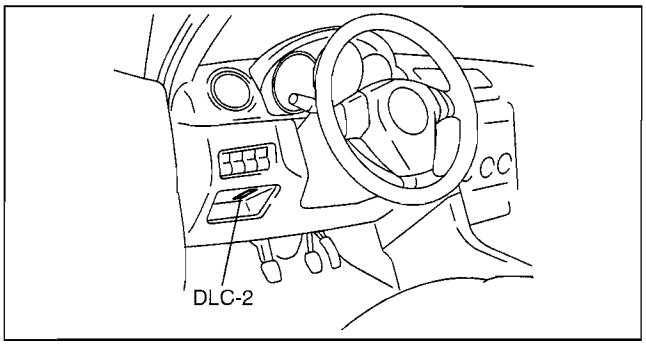
ENGINE TUNE-UP[L3 WITH TC]

id011039800600

Note
- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

Engine Tune-up Preparation

1. Verify that the shift lever is in neutral position
2. Connect the M-MDS to the DLC-2.
3. Verify that no DTCs are available.
4. Warm up the engine (ECT is **approx. 80°C {176 °F} or more**).
5. Turn off the electrical loads.
6. Wait until the cooling fans stop.



am3zzw0000351

Ignition Timing Inspection

Note
- The ignition timing cannot be adjusted.
- The M-MDS is required to verify the ignition timing.

1. Verify the ignition timing (M-MDS: SPARKADV) using the PID/data monitor function of the M-MDS.

Ignition timing
Approx. BTDC 10°

2. Verify that ignition timing advances when the engine speed increases gradually.
   - If there is malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)

Idle Speed Inspection

Note
- Idle speed is not adjustable.
- Idle speed verification requires M-MDS.

1. Verify that the idle speed (M-MDS: RPM PID) is within the specification using M-MDS.
   - If there is malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)

Idle speed
No load: 650—750 rpm
Electrical load on*1: 650—750 rpm
P/S operation: 650—750 rpm
A/C operation: 700—800 rpm

*1 : When the following electrical loads are on: Headlights, rear defroster, cooling fan No.1, cooling fan No.2, and the blower motor (2-step or more.)

Idle Mixture Inspection

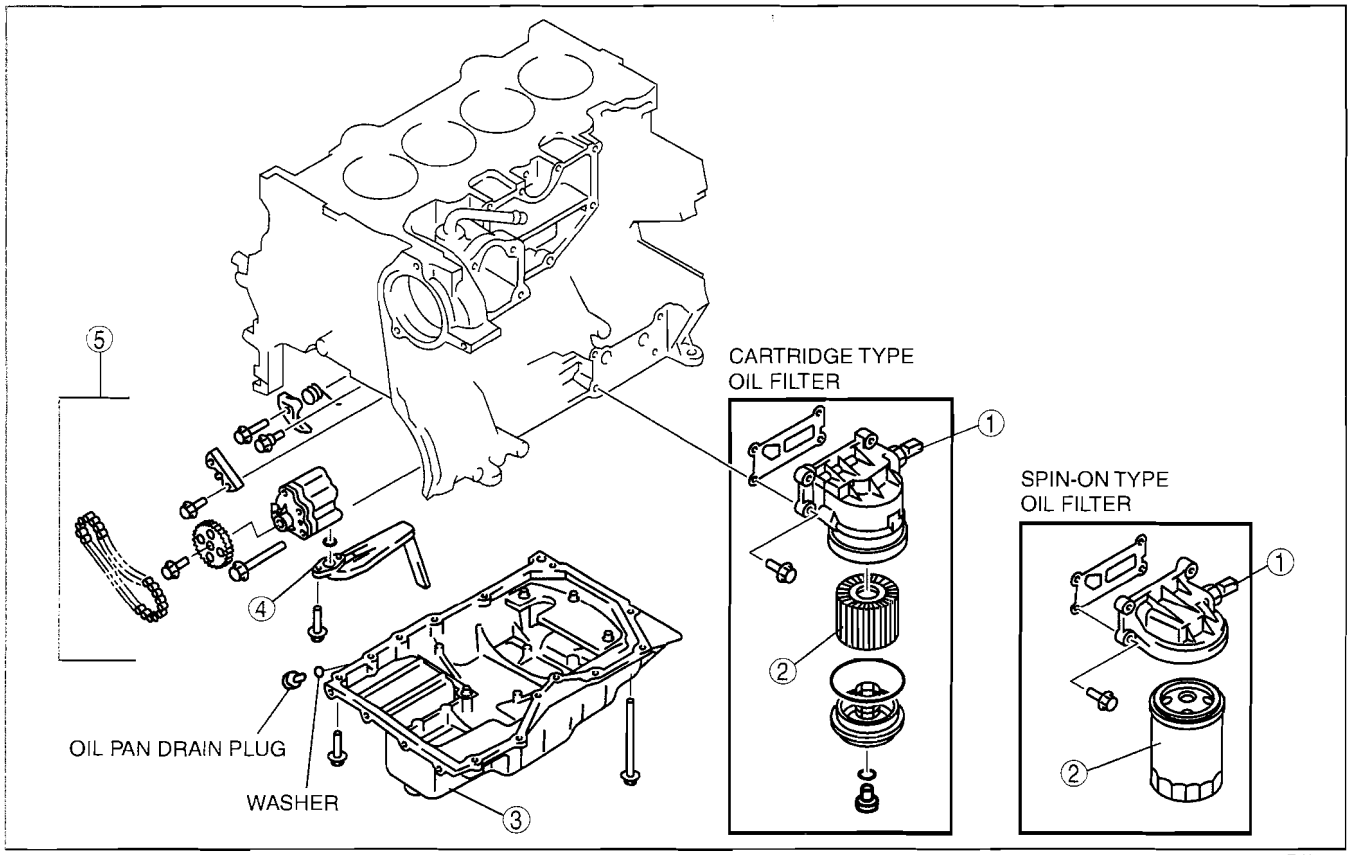
1. Verify that the idle speed and ignition timing are within the specification. (See01-10B-35 Idle Speed Inspection.) (See01-10B-35 Ignition Timing Inspection.)
2. Insert an exhaust gas analyzer to the tailpipe.
3. Verify that the CO and HC concentrations are within the regulation.

Idle mixture
HC concentration: Within the regulation
CO concentration: Within the regulation

01-11A LUBRICATION [LF, L3]

LUBRICATION SYSTEM LOCATION INDEX[LF, L3]

id0111c2800100



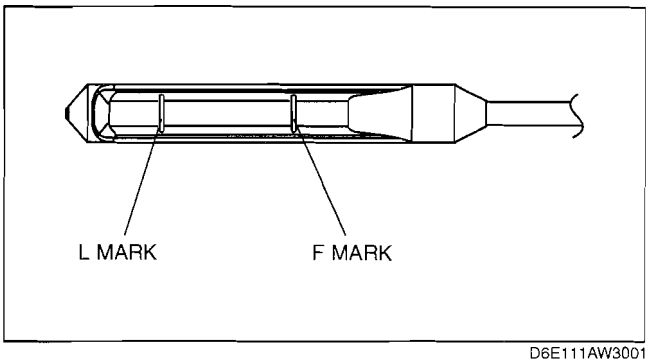
E3U111ZW6001

1	Oil pressure switch (See 01-11A-3 OIL PRESSURE INSPECTION[LF, L3].)
2	Oil filter (See 01-11A-4 OIL FILTER REPLACEMENT[LF, L3].)
3	Oil pan (See 01-11A-5 OIL PAN REMOVAL/ INSTALLATION[LF, L3].)
4	Oil strainer (See 01-11A-8 OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)
5	Oil pump component (See 01-11A-8 OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)

ENGINE OIL LEVEL INSPECTION[LF, L3]

id0111c2800500

1. Position the vehicle on level ground.
2. Warm up the engine.
3. Stop the engine and allow **approx. 5 min** before continuing.
4. Remove the dipstick and verify that the oil level is between the F and L marks on the dipstick.
   - If the oil level is below the L mark, add engine oil.



D6E111AW3001

ENGINE OIL REPLACEMENT[LF, L3]

id0111c2800400

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to used engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

Caution

- **In case you spill engine oil on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**

1. Position the vehicle on level ground.
2. Remove the oil filler cap.
3. Remove the oil pan drain plug.
4. Drain the engine oil into a container.
5. Install the oil pan drain plug with a new washer.

Oil pan drain plug tightening torque
30—41 N·m {3.0—4.2 kgf·m, 22—30 ft·lbf}

Note
- The amount of residual oil in the engine can vary according to the replacement method, oil temperature, etc. Verify the oil level after engine oil replacement.

6. Refill with the following type and amount of the engine oil.

Engine oil specification

Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade	(ILSAC)	(ILSAC) API SL or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)

Oil capacity (approx. quantity)

L {US qt, Imp qt}

Item	Specifications
Oil replacement	3.9 {4.1, 3.4}
Oil and oil filter replacement	4.3 {4.5, 3.8}
Total (dry engine)	4.6 {4.9, 4.0}

7. Install the oil filler cap.
8. Start the engine and confirm that there is no oil leakage.
   - If there is oil leakage, repair or replace the applicable part.
9. Inspect the oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)

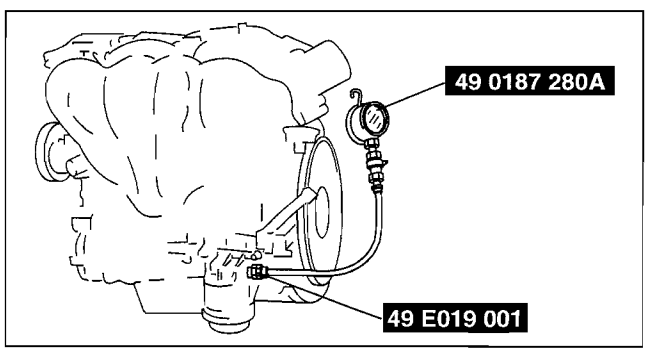
OIL PRESSURE INSPECTION[LF, L3]

id0111c2800300

Warning
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**
- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the oil pressure switch.
5. Screw the **SST** into the oil pressure switch installation hole.
6. Warm up the engine to normal operating temperature.
7. Run the engine at the specified speed, and note the gauge readings.
   - If the pressure is not as specified, inspect for the cause and repair or replace if necessary.

Note
- The oil pressure can vary with oil viscosity and temperature.



D6E111AW3004

Oil pressure (reference value) [oil temperature: 100 °C {212 °F}]

337—591 kPa {3.44—6.03 kgf/cm^2, 49.0—85.8 psi} [3,000 rpm]

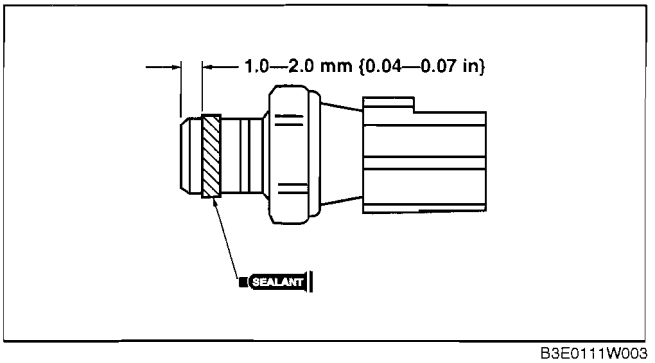
8. Stop the engine and wait until it is cool.
9. Remove the **SST**.

Caution
- **Be sure there is no sealant between 1.0—2.0 mm {0.04—0.07 in} from the end of the oil pressure switch to prevent a possible operation malfunction.**

10. Apply silicone sealant to the oil pressure switch threads as shown.
11. Install the oil pressure switch.

Tightening torque
12—18 N·m {1.2—1.8 kgf·m, 9—13 ft·lbf}

12. Install the under cover.
13. Connect the negative battery cable.
14. Install the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
15. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.



B3E0111W003

OIL FILTER REPLACEMENT[LF, L3]

id0111c2800700

Warning
- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to used engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

Caution
- **In case you spill engine oil on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**

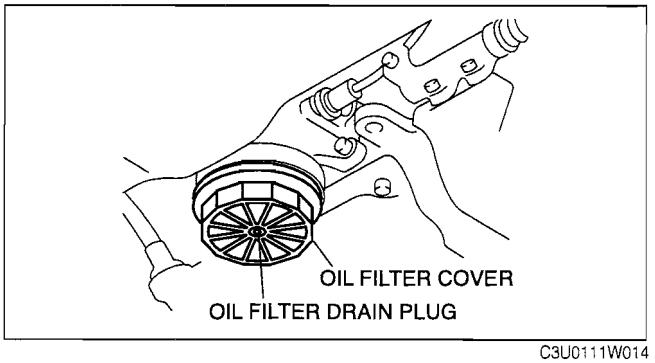
Cartridge Type

Caution
- **To avoid damage to the oil filter, use only specified oil filter.**

1. Remove the under cover.
2. Loosen the oil filter drain plug. (Do not remove.)
3. Loosen the filter cover for 1 turn using a commercially available, cup-type oil filter wrench (**74 mm {2.9 in} diameter, 14 sided**).
4. Remove the oil filter drain plug, and drain the engine oil.

Note
- Oil could be easily drained when the air is in the filter.

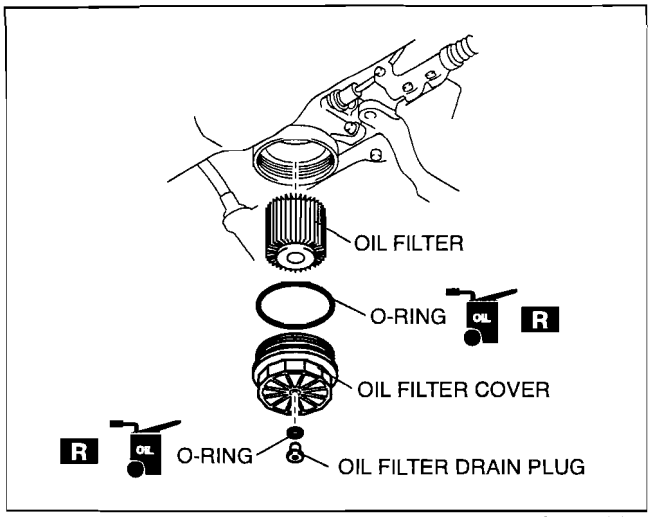
5. Loosen the oil filter cover for another 1 turn.



C3U0111W014

6. Remove the oil filter cover and the oil filter.
7. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil filter cover.
8. Apply clean oil to a new O-ring of the oil filter cover.
9. Apply clean oil to a new O-ring of the oil filter drain plug.
10. Install the oil filter, oil filter drain plug, and oil filter cover.
11. Tighten the oil filter cover and the oil filter drain plug.

Tightening torque
Oil filter cover: 30—35 N·m {3.1—3.5 kgf·m, 22.2—25.8 ft·lbf}
Oil filter drain plug: 9—11 N·m {91.8—112.2 kgf·cm, 79.6—97.2 in·lbf}



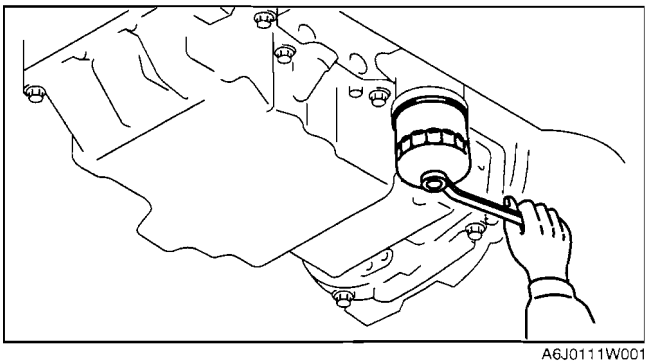
C3U0111W015

12. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
13. Inspect the oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
14. Install the under cover.

Spin-on Type

1. Remove the under cover.
2. Remove the oil filter using a commercially available, cup-type oil filter wrench (**76 mm {3.0 in} diameter, 15 sided**).
3. Use a clean rag to wipe off the mounting surface.
4. Apply clean engine oil to the gasket of a new oil filter.
5. Tighten the oil filter using cup-type oil filter wrench and according to the instructions on the package or side of the oil filter.

Tightening torque (reference value)
15—20 N·m {1.6—2.0 kgf·m, 11—14 ft·lbf}



A6J0111W001

6. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
7. Inspect the oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
8. Install the under cover.

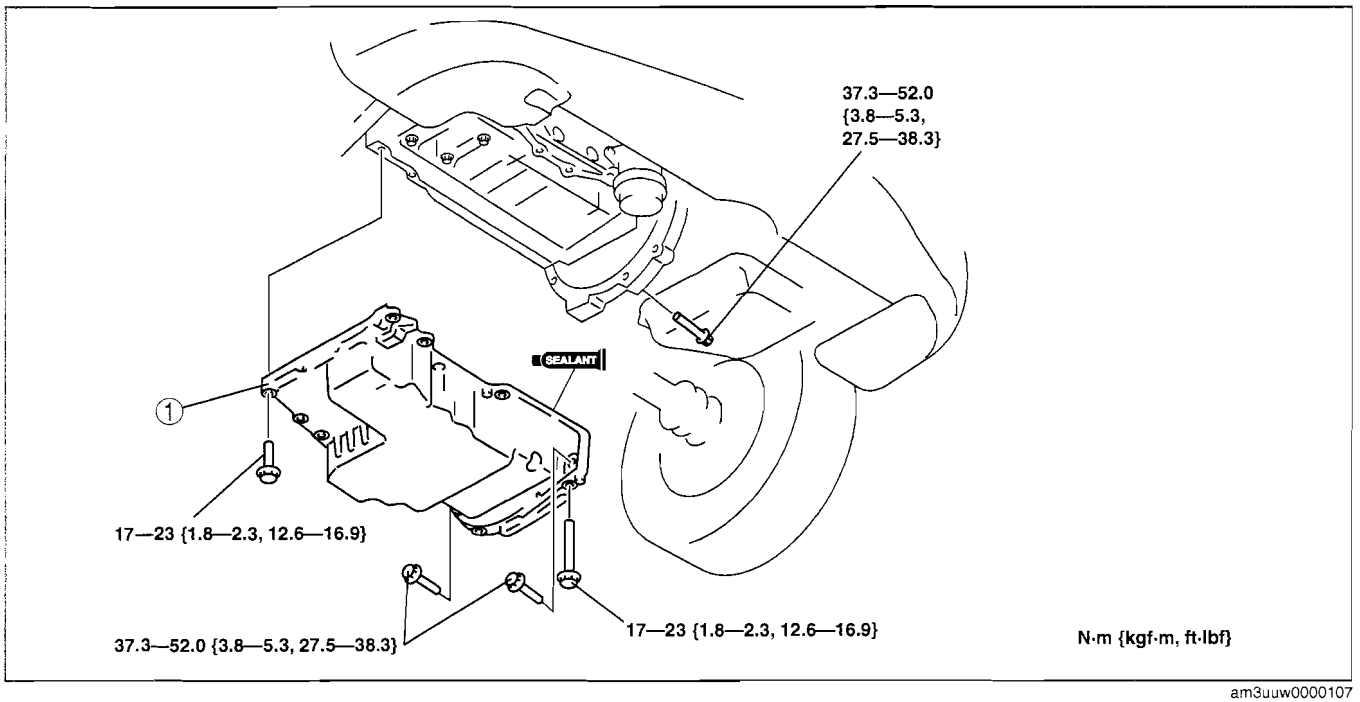
OIL PAN REMOVAL/INSTALLATION[LF, L3]

id0111c2800200

Warning
- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to used engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Remove the front tire (RH).
5. Drain the engine oil. (See 01-11A-2 ENGINE OIL REPLACEMENT[LF, L3].)
6. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
7. Remove the drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
8. Position the coolant reserve tank out of the way.

9. Remove the A/C compressor with the pipes still connected. (See 07-11-15 A/C COMPRESSOR REMOVAL/INSTALLATION[LF, L3].)
10. Remove the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
11. Remove the crankshaft position (CKP) sensor. (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
12. Remove the engine front cover. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
13. Remove in the order indicated in the table.
14. Install in the reverse order of removal.
15. Refill with the specified type and amount of the engine oil. (See 01-11A-2 ENGINE OIL REPLACEMENT[LF, L3].)
16. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
17. Inspect the oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
18. Inspect for the ignition timing and idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)

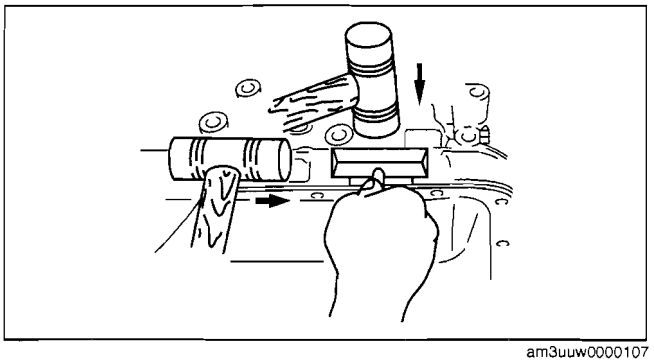


am3uuw0000107

1	Oil pan (See 01-11A-6 Oil Pan Removal Note.) (See 01-11A-7 Oil Pan Installation Note.)

Oil Pan Removal Note

1. Remove the oil pan using the separator tool.

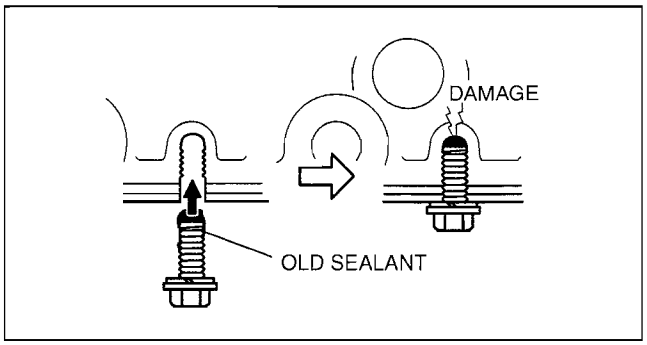


am3uuw0000107

Oil Pan Installation Note

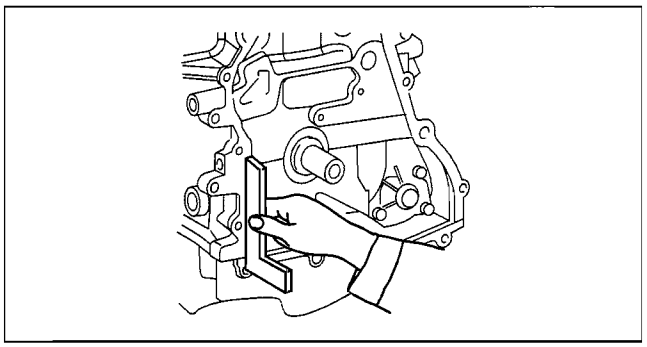
Caution
- **Apply the silicon sealant in a single, unbroken line around the whole perimeter.**
- **Using bolts with the old seal adhering could cause cracks in the housing.**

1. Completely clean and remove any oil, dirt, sealant or other foreign material that may be adhering to the housing and oil pan.
2. When reusing oil pan installation bolts, clean any old sealant from the bolts.



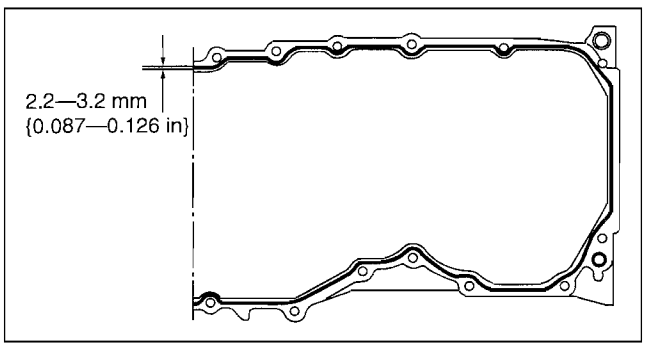
am3uuw0000107

3. Use a square ruler to align the oil pan and the cylinder block junction side on the engine front cover side.


am3uuw0000107

4. Apply silicone sealant to the oil pan along the inside of the bolt holes as shown in the figure.

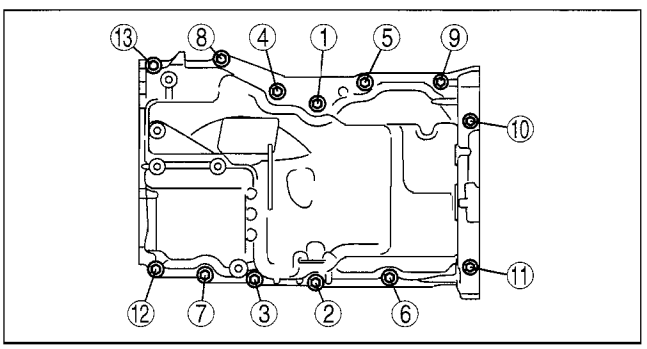
   Thickness
   2.2—3.2 mm {0.087—0.126 in}



am3uuw0000107

5. Tighten the bolts in the order shown in the figure.

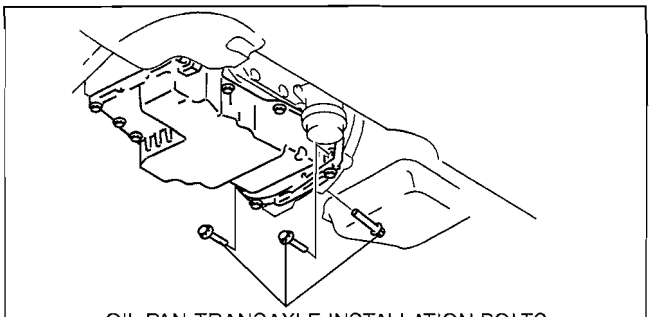
   Tightening torque
   17—23 N·m {1.8—2.3 kgf·m, 12.6—16.9 ft·lbf}



am3uuw0000107

6. Tighten the oil pan-transaxle installation bolts.

Tightening torque
37.3—52.0 N·m {3.8—5.3 kgf·m, 27.5—38.3 ft·lbf}


OIL PAN-TRANSAXLE INSTALLATION BOLTS

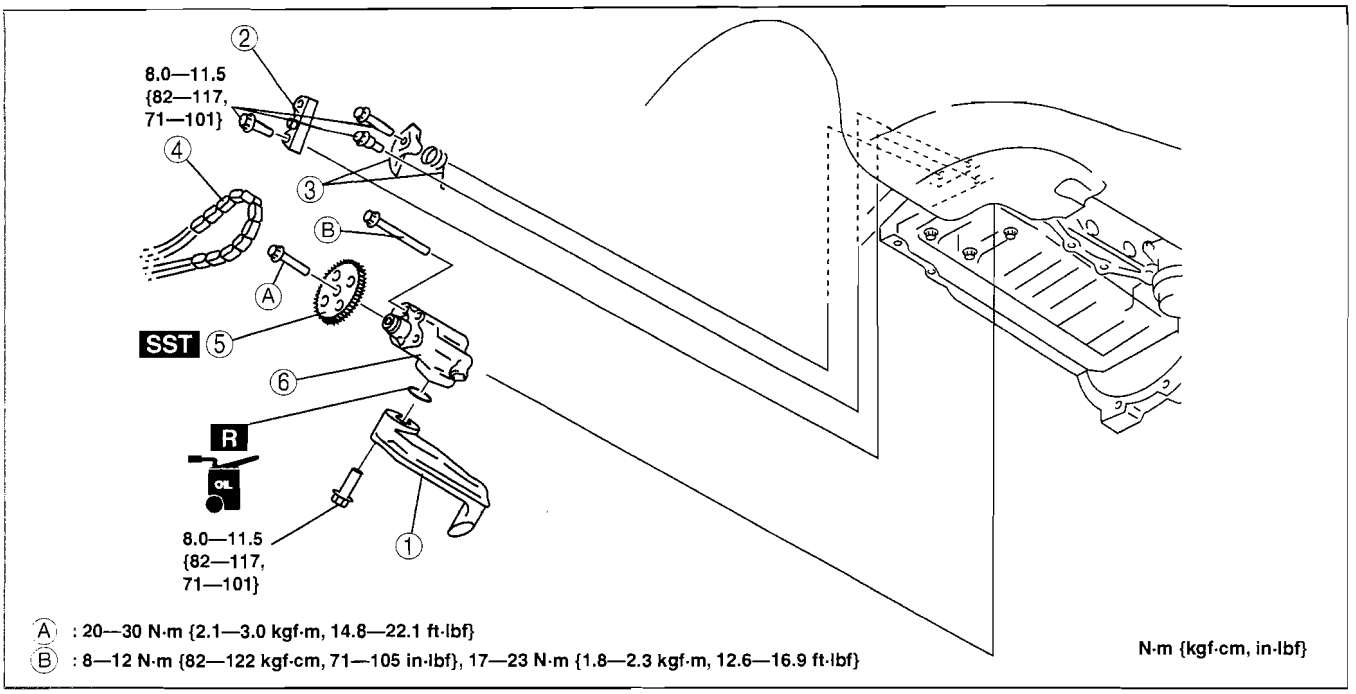
am3uuw0000108

OIL PUMP REMOVAL/INSTALLATION[LF, L3]

id0111c2800600

Warning
- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to used engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Remove the front tire (RH).
5. Drain the engine oil. (See 01-11A-2 ENGINE OIL REPLACEMENT[LF, L3].)
6. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
7. Remove the drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
8. Position the coolant reserve tank out of the way.
9. Remove the A/C compressor with the pipes still connected. (See 07-11-15 A/C COMPRESSOR REMOVAL/INSTALLATION[LF, L3].)
10. Remove the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
11. Remove the crankshaft position (CKP) sensor. (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
12. Remove the engine front cover. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
13. Remove the oil pan. (See 01-11A-5 OIL PAN REMOVAL/INSTALLATION[LF, L3].)
14. Remove in the order indicated in the table.
15. Install in the reverse order of removal.
16. Refill with the specified type and amount of the engine oil. (See 01-11A-2 ENGINE OIL REPLACEMENT[LF, L3].)
17. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
18. Inspect the oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
19. Inspect for the ignition timing and idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)



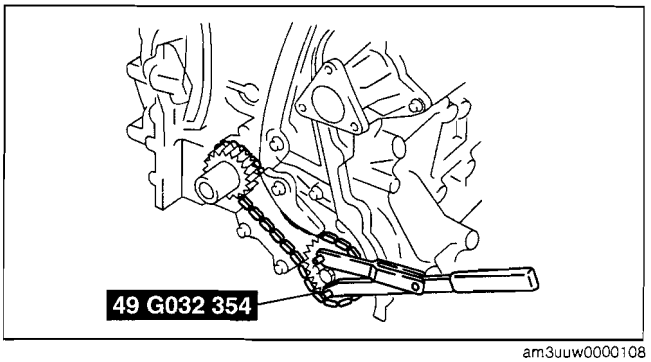
am3uuw0000108

1	Oil strainer
2	Oil pump chain guide
3	Oil pump chain tensioner
4	Oil pump chain

5	Oil pump sprocket (See 01-11A-9 Oil Pump Sprocket Removal/ Installation Note.)
6	Oil pump (See 01-11A-9 Oil Pump Installation Note.)

Oil Pump Sprocket Removal/Installation Note

1. Install the **SST** to the oil pump sprocket to stop the oil pump from rotating.

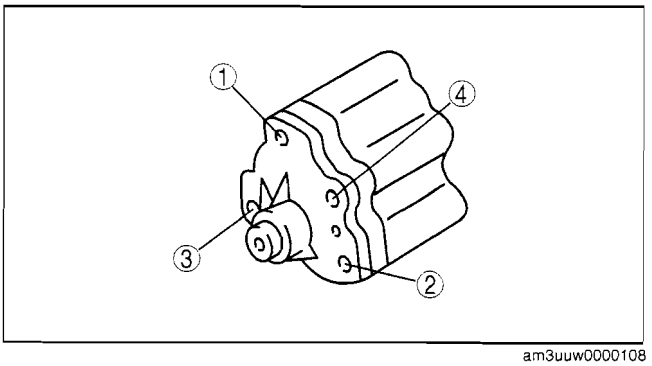


am3uuw0000108

Oil Pump Installation Note

1. Tighten the oil pump bolts in two steps in the order shown in the figure.

Tightening torque
Step 1: 8—12 N·m {82—122 kgf·cm, 71—105 in·lbf}
Step 2: 17—23 N·m {1.8—2.3 kgf·m, 12.6—16.9 ft·lbf}

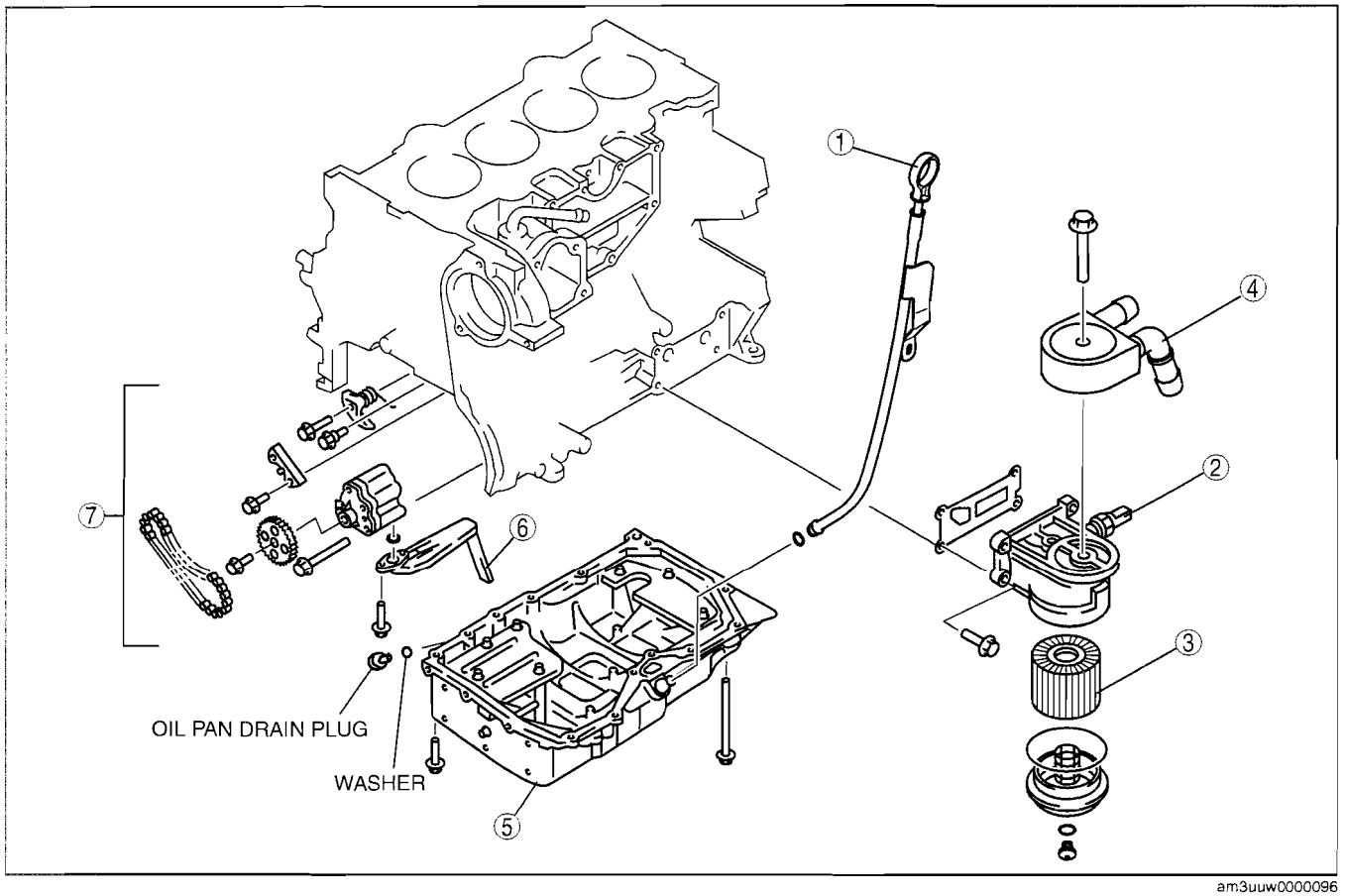


am3uuw0000108

01-11B LUBRICATION [L3 WITH TC]

LUBRICATION SYSTEM LOCATION INDEX[L3 WITH TC]

id011139800100



am3uuw0000096

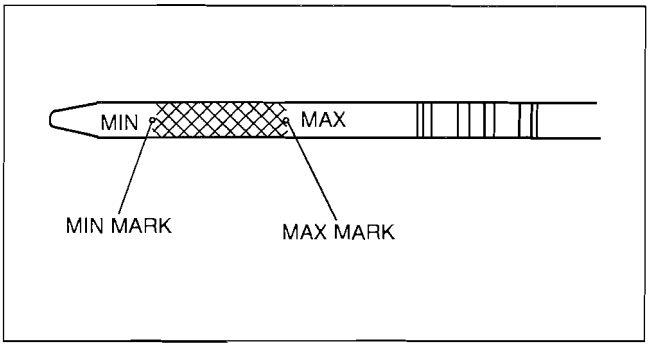
1	Dipstick (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].) (See 01-11B-2 ENGINE OIL REPLACEMENT[L3 WITH TC].)
2	Oil pressure switch (See 01-11B-3 OIL PRESSURE INSPECTION[L3 WITH TC].)
3	Oil filter (See 01-11B-4 OIL FILTER REPLACEMENT[L3 WITH TC].)

4	Oil cooler (See 01-11B-5 OIL COOLER REMOVAL/INSTALLATION[L3 WITH TC].)
5	Oil pan (See 01-11B-5 OIL PAN REMOVAL/INSTALLATION[L3 WITH TC].)
6	Oil strainer (See 01-11B-8 OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
7	Oil pump component (See 01-11B-8 OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)

ENGINE OIL LEVEL INSPECTION[L3 WITH TC]

id011139800500

1. Position the vehicle on level ground.
2. Warm up the engine.
3. Stop the engine and allow **approx. 5 min** before continuing.
4. Remove the dipstick and verify that the oil level is between the MIN and MAX marks on the dipstick.
   - If the oil level is below the MIN mark, add engine oil.



acxuuw00002002

ENGINE OIL REPLACEMENT[L3 WITH TC]

id011139800400

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

Caution

- **If engine oil is spilled on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**

1. Position the vehicle on level ground.
2. Remove the oil filler cap.
3. Remove the oil pan drain plug.
4. Drain the engine oil into a container.
5. Install the oil pan drain plug with a new washer.

Oil pan drain plug tightening torque
30—41 N·m {3.1—4.1 kgf·m, 23—30 ft·lbf}

Note

- The amount of residual oil in the engine can vary according to factors such as the replacement method and oil temperature. Verify the oil level after engine oil replacement.

6. Refill with the following type and amount of the engine oil.

Engine oil capacity (approx. quantity)
Oil replacement: 5.3 L {5.6 US qt, 4.7 Imp qt}
Oil and oil filter replacement: 5.7 L {6.0 US qt, 5.0 Imp qt}
Total (dry engine): 6.4 L {6.8 US qt, 5.6 Imp qt}

Engine oil specification

Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade	(ILSAC)	(ILSAC) API SM or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)

7. Install the oil filler cap.
8. Start the engine and confirm that there is no oil leakage.
   - If there is oil leakage, repair or replace the applicable part.
9. Inspect the oil level. (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].)

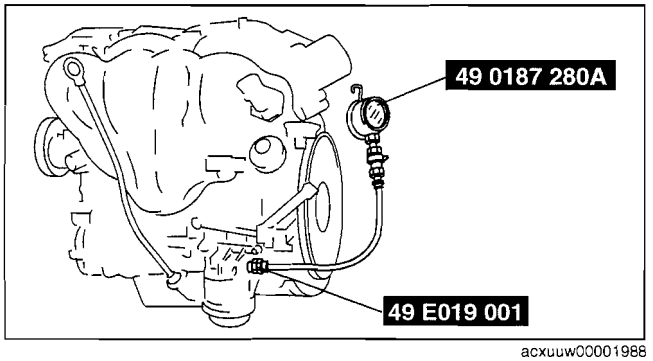
OIL PRESSURE INSPECTION[L3 WITH TC]

id011139800300

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the oil pressure switch.
5. Screw the **SSTs** into the oil pressure switch installation hole.
6. Connect the negative battery cable.
7. Warm up the engine to normal operating temperature.
8. Run the engine at the specified speed, and note the gauge readings.
   - If not within the specification, inspect for the cause and repair or replace if necessary.



acxuuw00001988

Note

- The oil pressure can vary with oil viscosity and temperature.

Oil pressure (reference value) [oil temperature: 100 °C {212 °F}]
297—551 kPa {3.03—5.61 kgf/cm^2, 43.1—79.9 psi} [3,000 rpm]

9. Stop the engine and wait until it is cool.
10. Disconnect the negative battery cable.
11. Remove the **SSTs.**

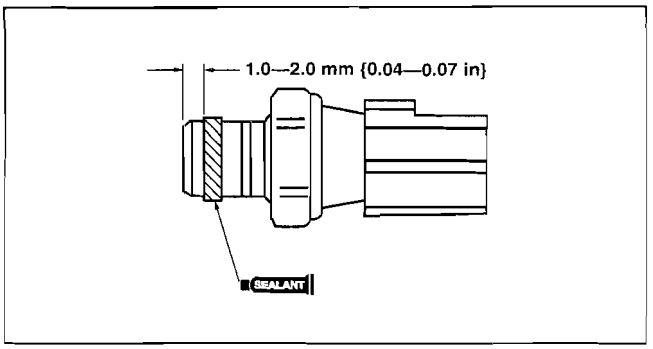
Caution

- **Make sure that there is no sealant between 1.0—2.0 mm {0.04—0.07 in} from the end of the oil pressure switch to prevent a possible operation malfunction.**

12. Apply silicone sealant to the oil pressure switch threads as shown in the figure.
13. Install the oil pressure switch.

    Tightening torque
    12—18 N·m {1.3—1.8 kgf·m, 9—13 ft·lbf}

14. Connect the negative battery cable.
15. Install the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
16. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
17. Install the under cover.



acxuuw00001989

OIL FILTER REPLACEMENT[L3 WITH TC]

id011139800700

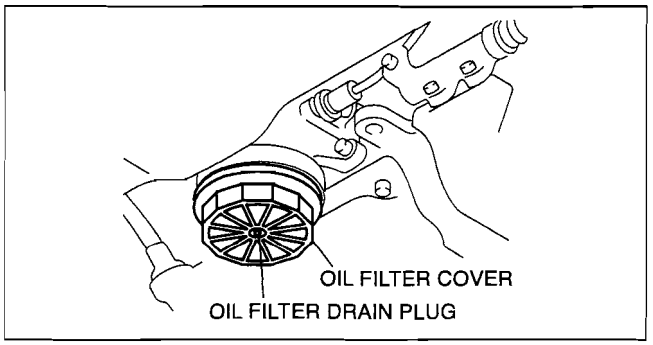
Warning
- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

Caution
- **If engine oil is spilled on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.**
- **To avoid damage to the oil filter, use only specified oil filter.**

1. Remove the under cover.
2. Loosen the oil filter drain plug. (Do not remove.)
3. Loosen the filter cover for 1 turn using a commercially available, cup-type oil filter wrench **(74 mm {2.9 in} diameter, 14 sided).**
4. Remove the oil filter drain plug, and drain the engine oil.

   Note
   - Oil could be easily drained when the air is in the filter.

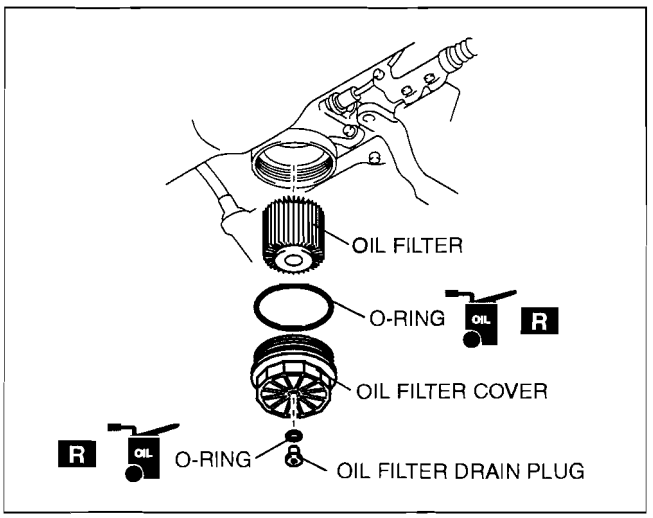
5. Loosen the oil filter cover for another 1 turn.



acxuuw00002007

6. Remove the oil filter cover and the oil filter.
7. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil filter cover.
8. Apply clean engine oil to a new O-ring of the oil filter cover.
9. Apply clean engine oil to a new O-ring of the oil filter drain plug.
10. Install the oil filter, oil filter drain plug, and oil filter cover.
11. Tighten the oil filter cover and the oil filter drain plug.

    Tightening torque
    Oil filter cover: 30—35 N·m {3.1—3.5 kgf·m, 22.2—25.8 ft·lbf}
    Oil filter drain plug: 9—11 N·m {91.8—112.2 kgf·cm, 79.6—97.2 in·lbf}



acxuuw00002008

12. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
13. Inspect the oil level. (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].)
14. Install the under cover.

OIL COOLER REMOVAL/INSTALLATION[L3 WITH TC]

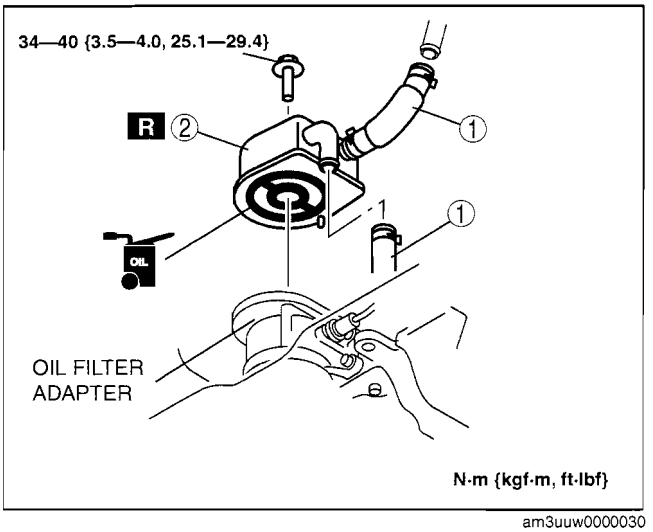
id011139800800

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
5. Remove in the order indicated in the table.
6. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil cooler.
7. Install in the reverse order of the removal.
8. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
9. Start the engine and confirm that there is no oil leakage.
   - If there is oil leakage, repair or replace the applicable part.
10. Inspect the oil level. (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].).

1	Water hose
2	Oil cooler



am3uuw0000030

OIL PAN REMOVAL/INSTALLATION[L3 WITH TC]

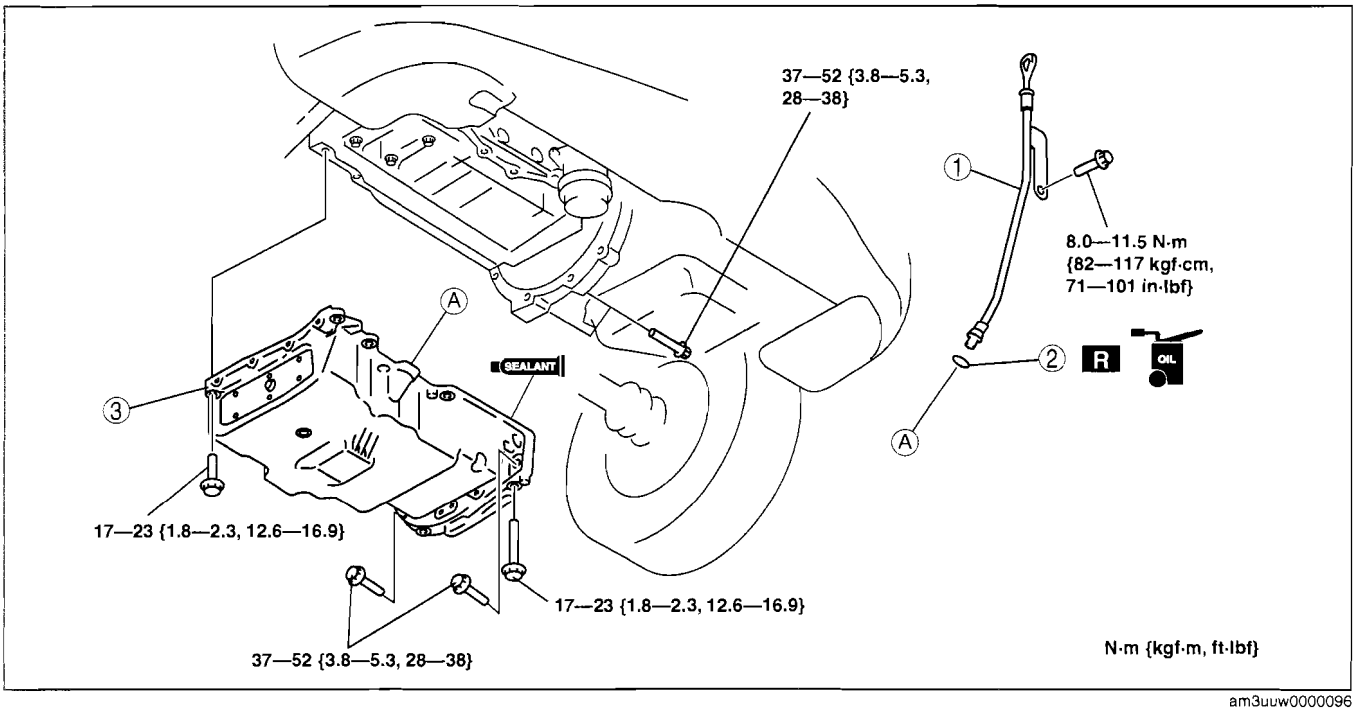
id011139800200

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Complete the "BEFORE SERVICE PRECAUTION". (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery, battery tray and PCM component. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the front tire (RH).
4. Remove the under cover and splash shield as a single unit.
5. Drain the engine oil. (See 01-11B-2 ENGINE OIL REPLACEMENT[L3 WITH TC].)
6. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
7. Remove the air cleaner, charge air cooler, and air hose. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
8. Disconnect the quick release connector on the high pressure fuel pump. (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)

9. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
10. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
11. Loosen the water pump pulley bolts before removing the drive belt.
12. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
13. Remove the P/S oil pump with hose and pipe still connected. Position the P/S oil pump out of the way. (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
14. Remove the crankshaft position (CKP) sensor. (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
15. Remove the engine front cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
16. Remove in the order indicated in the table.
17. Install in the reverse order of removal.
18. Refill with the specified type and amount of the engine oil. (See 01-11B-2 ENGINE OIL REPLACEMENT[L3 WITH TC].)
19. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
20. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
21. Inspect the oil level. (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].)
22. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
23. Inspect for the ignition timing and idle speed. (See 01-10B-35 ENGINE TUNE-UP[L3 WITH TC].)



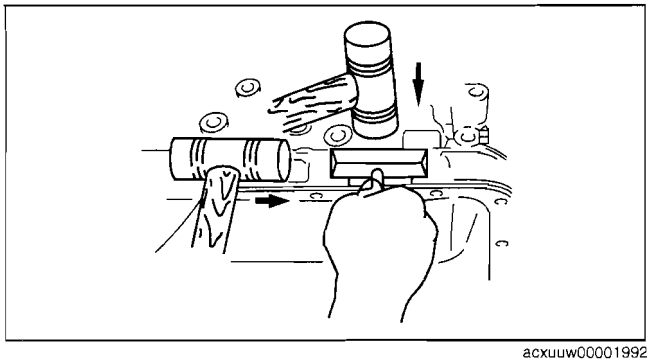
am3uuw0000096

1	Dipstick pipe
2	O-ring

3	Oil pan (See 01-11B-7 Oil Pan Removal Note.) (See 01-11B-7 Oil Pan Installation Note.)

Oil Pan Removal Note

1. Remove the oil pan using a separator tool.



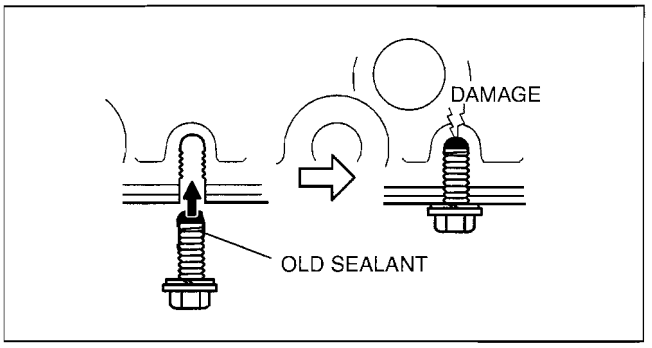
acxuuw00001992

Oil Pan Installation Note

Caution

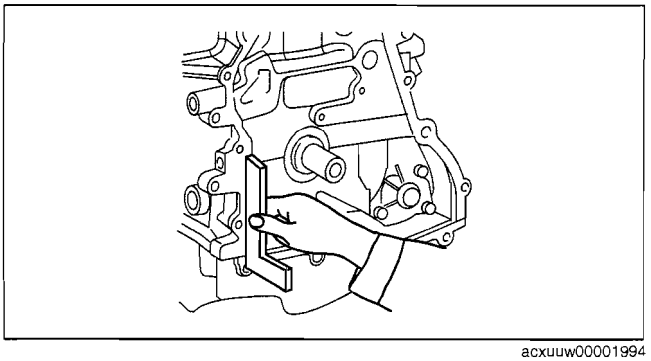
- **Apply the silicon sealant in a single, unbroken line around the whole perimeter.**
- **Using bolts with the old seal adhering could cause cracks in the housing.**

1. Completely clean and remove any oil, dirt, sealant or other foreign material that may be adhering to the housing and oil pan.
2. When reusing the oil pan installation bolts, clean any old sealant from the bolts.



acxuuw00001993

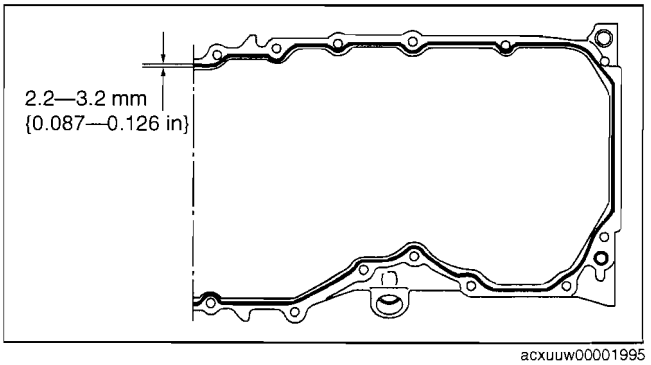
3. Use a square ruler to align the oil pan and the cylinder block junction side on the engine front cover side.



acxuuw00001994

4. Apply silicone sealant to the oil pan along the inside of the bolt holes as shown in the figure.

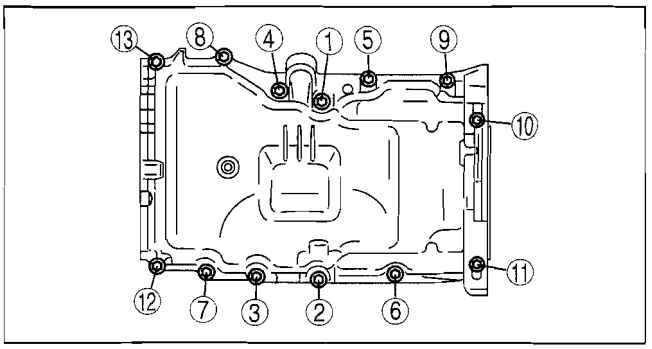
Thickness
2.2—3.2 mm {0.087—0.126 in}



acxuuw00001995

5. Tighten the bolts in the order shown in the figure.

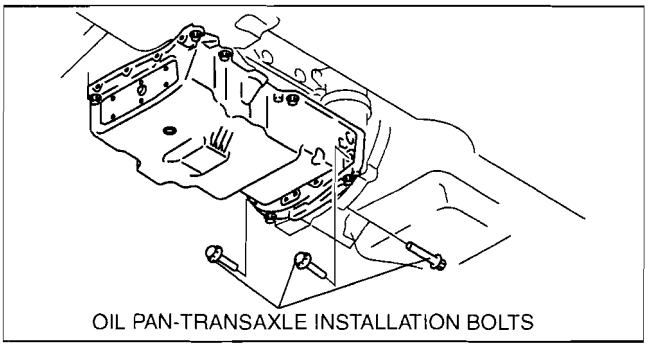
Tightening torque
17—23 N·m {1.8—2.3 kgf·m, 12.6—16.9 ft·lbf}



acxuuw00001996

6. Tighten the oil pan-transaxle installation bolts.

Tightening torque
37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}



OIL PAN-TRANSAXLE INSTALLATION BOLTS

acxuuw00001997

OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC]

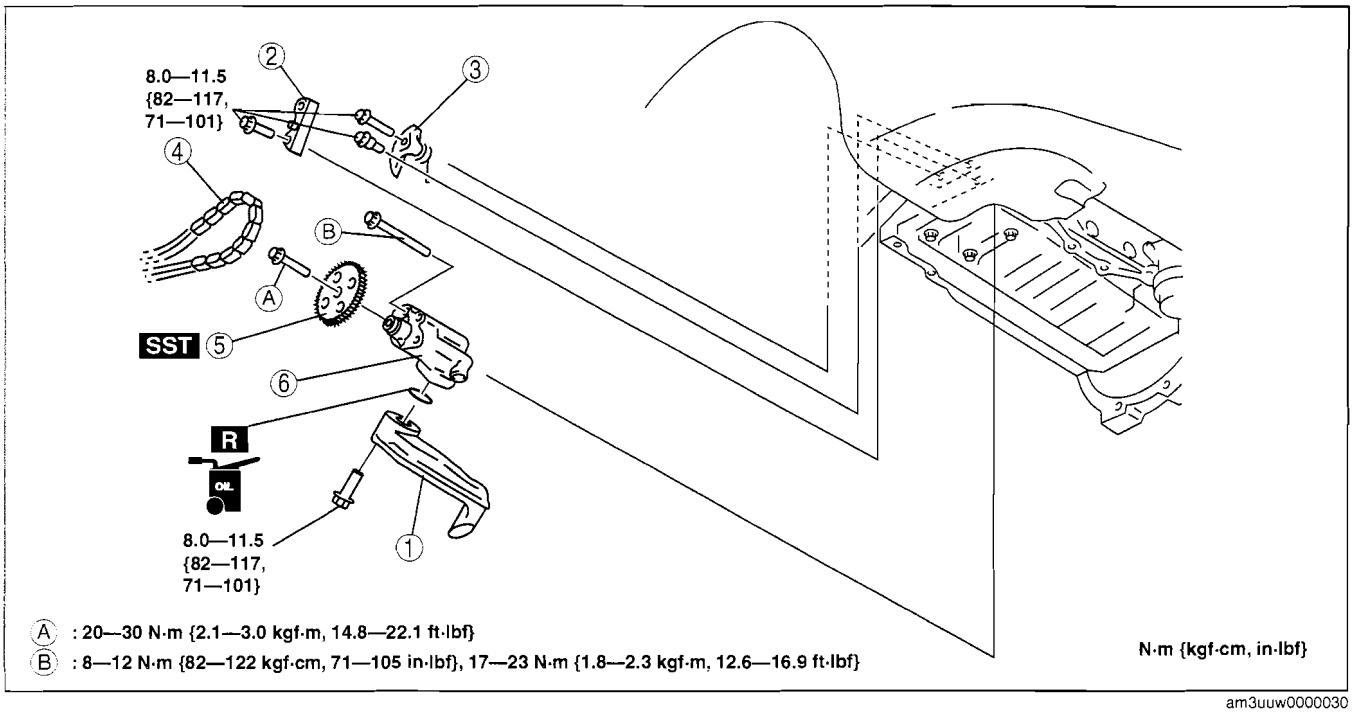
id011139800600

Warning

- **Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.**
- **A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.**
- **Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.**

1. Complete the "BEFORE SERVICE PRECAUTION". (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery, battery tray and PCM component. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the front tire (RH).
4. Remove the under cover and splash shield as a single unit.
5. Drain the engine oil. (See 01-11B-2 ENGINE OIL REPLACEMENT[L3 WITH TC].)
6. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
7. Remove the air cleaner, charge air cooler, and air hose. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
8. Disconnect the quick release connector on the high pressure fuel pump. (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
9. Remove the high pressure fuel pump. (See 01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
10. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
11. Loosen the water pump pulley bolts before removing the drive belt.
12. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
13. Remove the P/S oil pump with hose and pipe still connected. Position the P/S oil pump out of the way. (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
14. Remove the crankshaft position (CKP) sensor. (See 01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].)
15. Remove the engine front cover. (See 01-10B-10 TIMING CHAIN REMOVAL/INSTALLATION[L3 WITH TC].)
16. Remove the oil pan. (See 01-11B-5 OIL PAN REMOVAL/INSTALLATION[L3 WITH TC].)
17. Remove in the order indicated in the table.
18. Install in the reverse order of removal.
19. Refill with the specified type and amount of the engine oil. (See 01-11B-2 ENGINE OIL REPLACEMENT[L3 WITH TC].)
20. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
21. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
22. Inspect the oil level. (See 01-11B-2 ENGINE OIL LEVEL INSPECTION[L3 WITH TC].)

23. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
24. Inspect for the ignition timing and idle speed. (See 01-10B-35 ENGINE TUNE-UP[L3 WITH TC].)
25. Inspect the oil pressure. (See 01-11B-3 OIL PRESSURE INSPECTION[L3 WITH TC].)



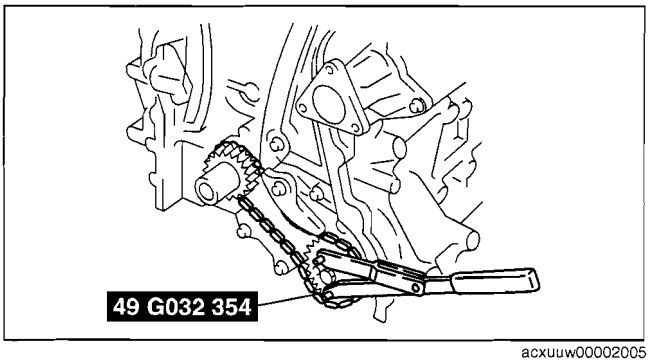
am3uuw0000030

1	Oil strainer
2	Oil pump chain guide
3	Oil pump chain tensioner
4	Oil pump chain

5	Oil pump sprocket (See 01-11B-9 Oil Pump Sprocket Removal/ Installation Note.)
6	Oil pump (See 01-11B-9 Oil Pump Installation Note.)

Oil Pump Sprocket Removal/Installation Note

1. Install the **SST** to the oil pump sprocket to stop the oil pump from rotating.

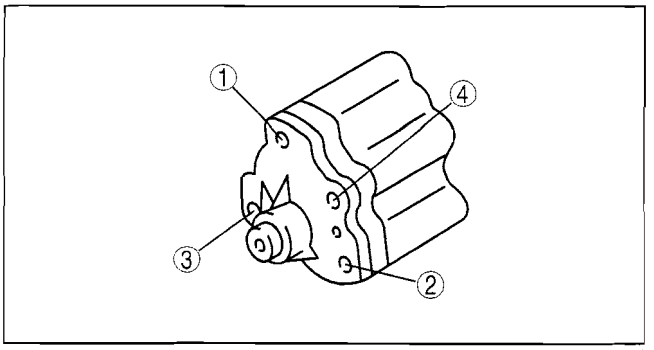


acxuuw00002005

Oil Pump Installation Note

1. Tighten the oil pump bolts in two steps in the order shown in the figure.

Tightening torque
Step 1: 8—12 N·m {82—122 kgf·cm, 71—105 in·lbf}
Step 2: 17—23 N·m {1.8—2.3 kgf·m, 12.6—16.9 ft·lbf}

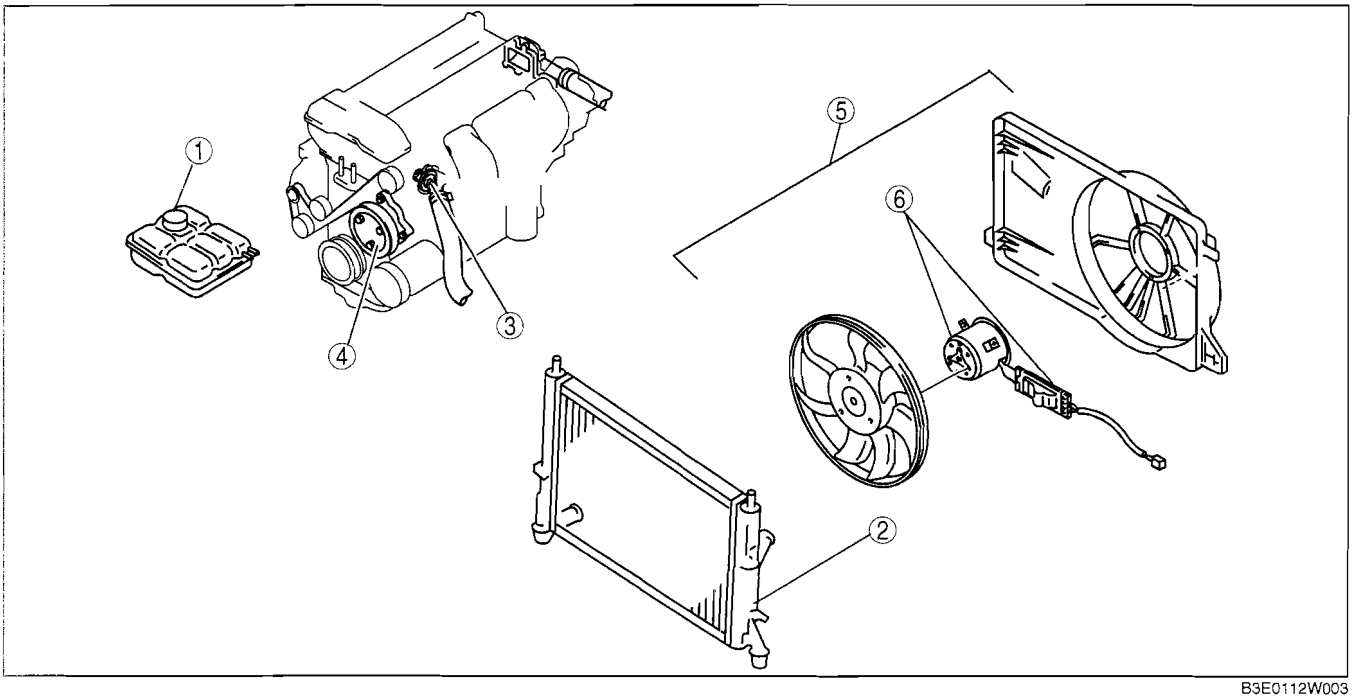


acxuuw00002006

01-12A COOLING SYSTEM [LF, L3]

COOLING SYSTEM LOCATION INDEX[LF, L3]

id0112c2800100



B3E0112W003

1	Cooling system cap (See 01-12A-5 COOLING SYSTEM CAP INSPECTION[LF, L3].)
2	Radiator (See 01-12A-6 RADIATOR REMOVAL/ INSTALLATION[LF, L3].)
3	Thermostat (See 01-12A-8 THERMOSTAT REMOVAL/ INSTALLATION[LF, L3].) (See 01-12A-8 THERMOSTAT INSPECTION[LF, L3].)

4	Water pump (See 01-12A-9 WATER PUMP REMOVAL/ INSTALLATION[LF, L3].)
5	Cooling fan component (See 01-12A-6 RADIATOR REMOVAL/ INSTALLATION[LF, L3].)
6	Cooling fan motor component (See 01-12A-9 COOLING FAN MOTOR COMPONENT INSPECTION[LF, L3].)

COOLING SYSTEM SERVICE WARNINGS[LF, L3]

id0112c2800200

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turns the cap using the cloth, and remove it.**

ENGINE COOLANT LEVEL INSPECTION[LF, L3]

id0112c2800300

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Verify that the engine coolant level in the coolant reserve tank is between the MIN and MAX marks.
2. If the engine coolant level is below MIN mark, add engine coolant.

ENGINE COOLANT PROTECTION INSPECTION[LF, L3]

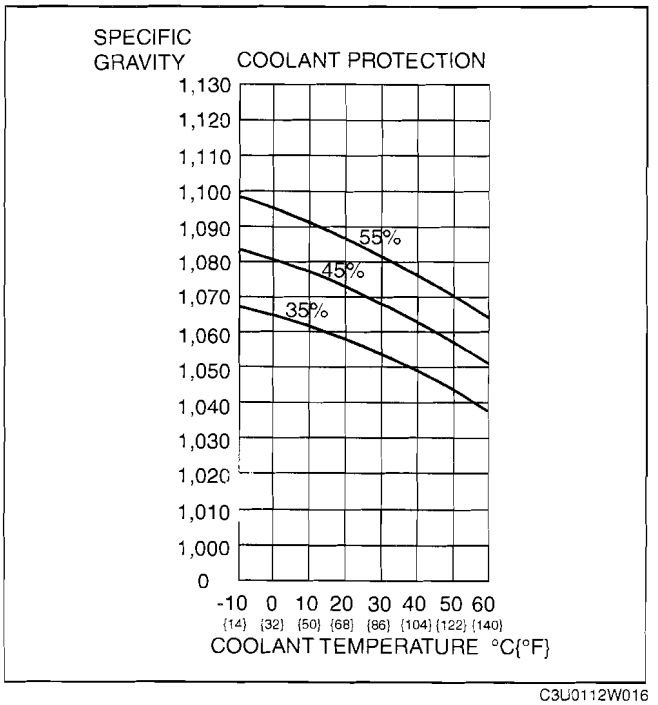
id0112c2800400

1. Measure the coolant temperature and specific gravity using a thermometer and a hydrometer.

Caution

- **Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.**
- **The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.**
- **Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**
- **Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.**

2. Determine the coolant protection level by referring to the graph shown.
   - If the coolant protection level is not correct, add water or coolant.



C3U0112W016

ENGINE COOLANT REPLACEMENT[LF, L3]

id0112c2800600

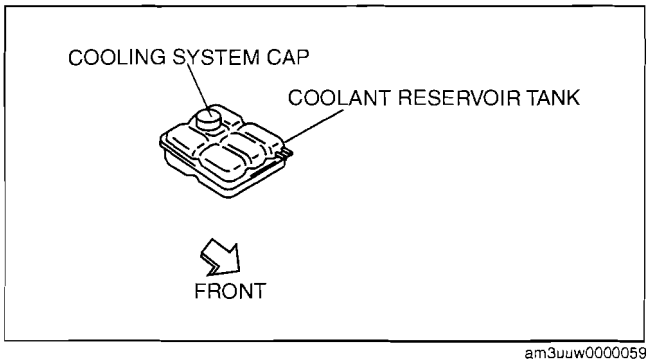
Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

Caution

- **Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.**
- **The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.**
- **Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**
- **Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.**

1. Remove the cooling system cap.
2. Remove the under cover.

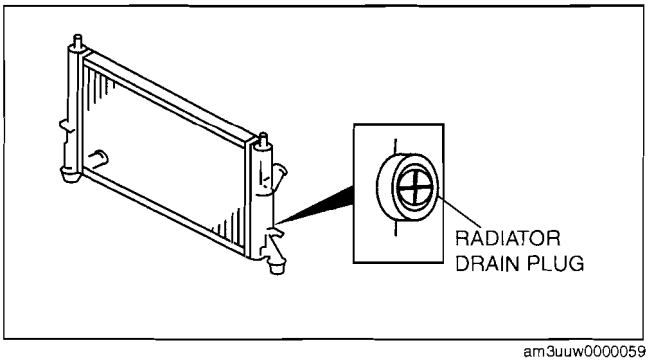


am3uuw0000059

3. Remove the radiator drain plug and drain the engine coolant into a container.
4. Flush the cooling system with water until all traces of color are gone.
5. Let the system drain completely.
6. Tighten the radiator drain plug.

Tightening torque
1.2—1.5 N·m {13—15 kgf·cm, 11—13 in·lbf}

7. Referring to the following chart, select the correct volume percentage of the water and coolant.



am3uuw0000059

Antifreeze solution mixture percentage

Coolant protection	Volume percentage		Gravity at 20 °C {68 °F}
	Water	Coolant	
Above –16 °C {3 °F}	65	35	1.057
Above –26 °C {–15°F}	55	45	1.072
Above –40 °C {–40 °F}	45	55	1.086

8. Refill the coolant into the coolant reserve tank up to the MAX mark on the tank.
9. Fully install the cooling system cap.

Caution
- **If the water temperature gauge rises too high, stop the engine and decrease the water temperature to prevent overheating. Then, verify the malfunctioning part and repair or replace it.**
- **If the engine coolant level in the coolant reserve tank is below the MIN mark during engine coolant air bleeding operation, stop the engine, and after the engine coolant temperature decreases, add engine coolant. Then, resume the engine coolant air bleeding operation.**

10. Start the engine and idle it until the thermometer indicator is in the center when the engine is at **below 1,500 rpm**.
11. Bleed the air by following the procedures below. At this time, be careful of the coolant temperature to prevent overheating.

Note
- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

(1) Run the engine at **2,500 rpm** for **2—3 min**, **2 times**.
(2) Run the engine at **3,000 rpm** for **5 s**, then idle.
(3) Repeat steps (1), (2) twice.

12. Stop the engine, and inspect the coolant level after the coolant temperature decreases (water temperature gauge indicates 'C' or less).
13. Check the coolant level.
    - If it is low, refill the coolant into the coolant reserve tank up to the MAX mark on the tank.
14. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)

ENGINE COOLANT LEAKAGE INSPECTION[LF, L3]

id0112c2800500

Warning
- **Never remove the cooling system cap while the engine is running, or when the engine and radiator are hot. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

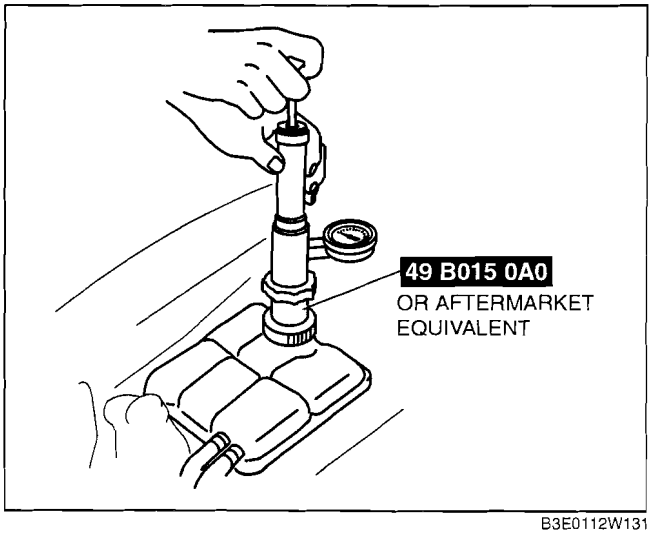
1. Inspect the engine coolant level.
2. Remove the cooling system cap.
3. Clean the installation parts of the cooling system cap.
4. Install the **SST** or aftermarket equivalent and a radiator cap tester to the coolant reserve tank filler port.
5. Apply pressure using the radiator cap tester.

Caution
- **Applying more than 145 kPa {1.5 kgf/cm^2, 21 psi} can damage the hoses, fittings, and other components, and cause leakage.**

Pressure

145 kPa {1.5 kgf/cm^2, 21 psi} [1 min]

6. When pressurizing the coolant reserve tank, verify that the pressure is maintained.
    - If the gauge needle drops, it may indicate water leakage. Repair or replace the applicable part.



B3E0112W131

COOLING SYSTEM CAP INSPECTION[LF, L3]

id0112c2801500

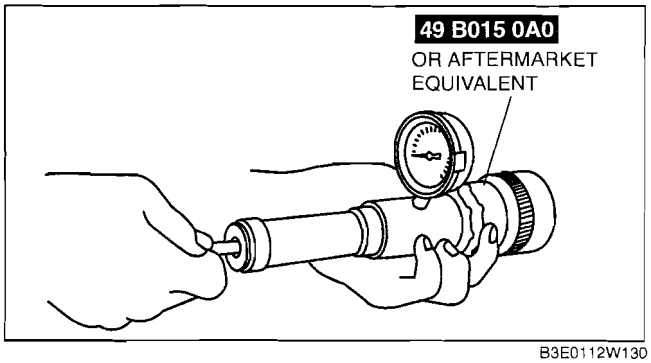
Warning

- **Never remove the cooling system cap while the engine is running, or when the engine and radiator are hot. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you"re sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Clean the cooling system cap and the sealed part.
2. Inspect the cooling system cap for cracks or everted seal.
   - If there is any malfunction, replace the cooling system cap.
3. Attach the cooling system cap to the radiator cap tester.
4. Hold the cooling system cap downward and apply pressure gradually. Verify that the pressure holds for **10 s**.
   - If the pressure is not held stable within the specification, replace the cooling system cap.

Pressure

135—155 kPa {1.38—1.58 kgf/cm^2, 19.6—22.4 psi}



B3E0112W130

COOLANT RESERVE TANK REMOVAL/INSTALLATION[LF, L3]

id0112c2801000

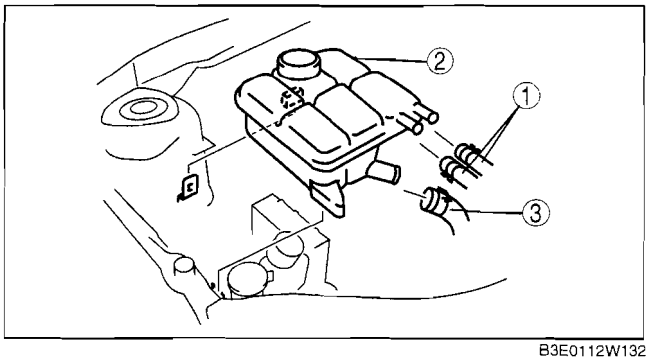
Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**

1. Drain the engine coolant until the coolant reserve tank becomes empty. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
2. Remove in the order indicated in the table.

1	Hose
2	Coolant reserve tank
3	Hose

3. Install in the reverse order of removal.
4. Add engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
5. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)



B3E0112W132

RADIATOR REMOVAL/INSTALLATION[LF, L3]

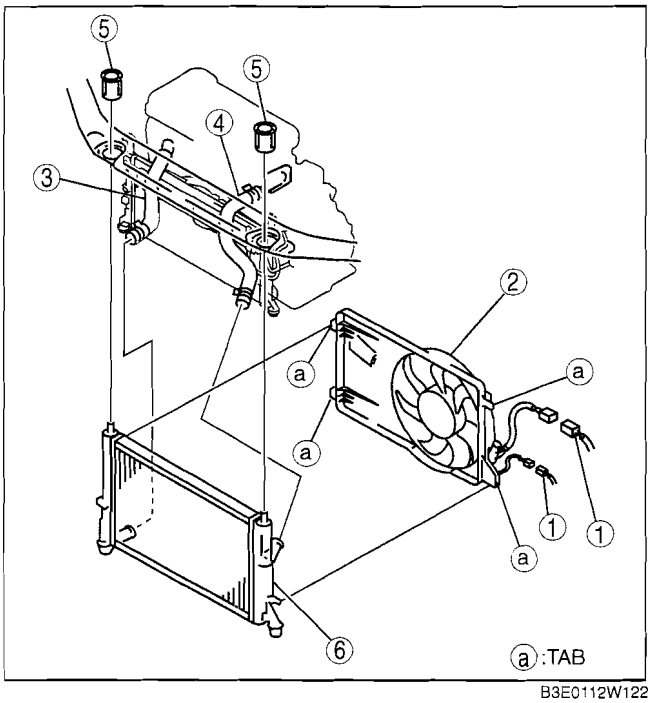
id0112c2801400

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
5. Disconnect the coolant reservoir hose from the radiator.
6. Position the front wiring harnesses out of the way.
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Add engine coolant.(See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
10. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)

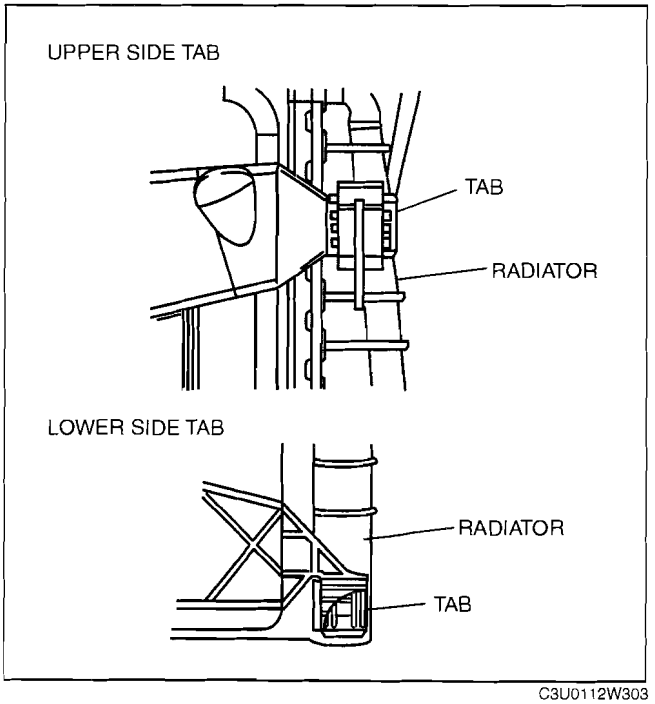
1	Fan control module connector
2	Cooling fan component (See 01-12A-6 Cooling Fan Component Removal Note.) (See 01-12A-7 Cooling Fan Component Installation Note.)
3	Radiator lower hose
4	Radiator upper hose
5	Radiator mount
6	Radiator (See 01-12A-7 Radiator Removal Note.) (See 01-12A-7 Radiator Installation Note.)



B3E0112W122

Cooling Fan Component Removal Note

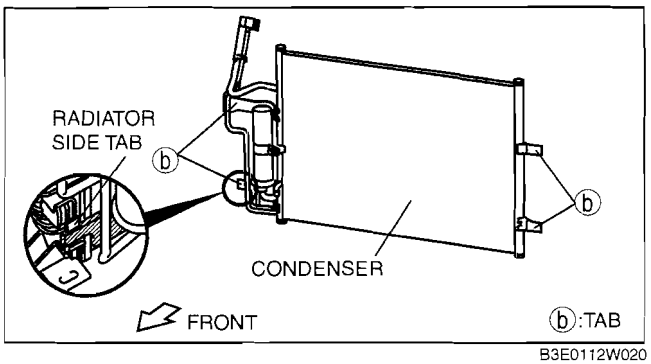
1. Unlock lower side tabs a at two points by pressing the cooling fan side tabs, remove upper side tabs a at two points, then remove the cooling fan component from the radiator.



C3U0112W303

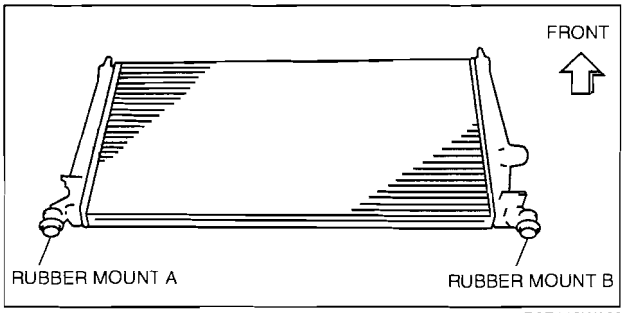
Radiator Removal Note

1. Remove the condenser from the radiator with the pipes still connected, by pressing the radiator side tabs to unlock tabs b on the condenser.



B3E0112W020

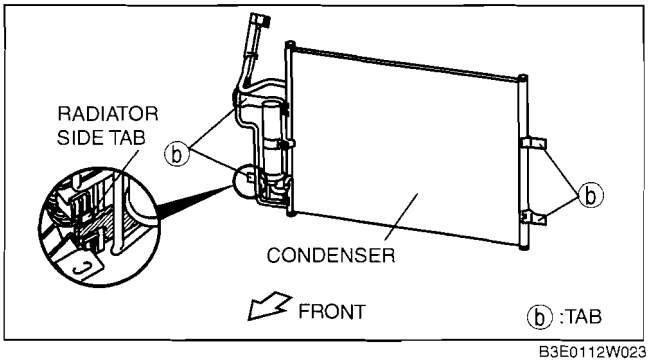
2. Remove rubber mount A from the mount installation hole.
3. Tilt the radiator to the engine side.
4. Remove rubber mount B from the mount installation hole.
5. Remove the radiator from below.



B3E112W002

Radiator Installation Note

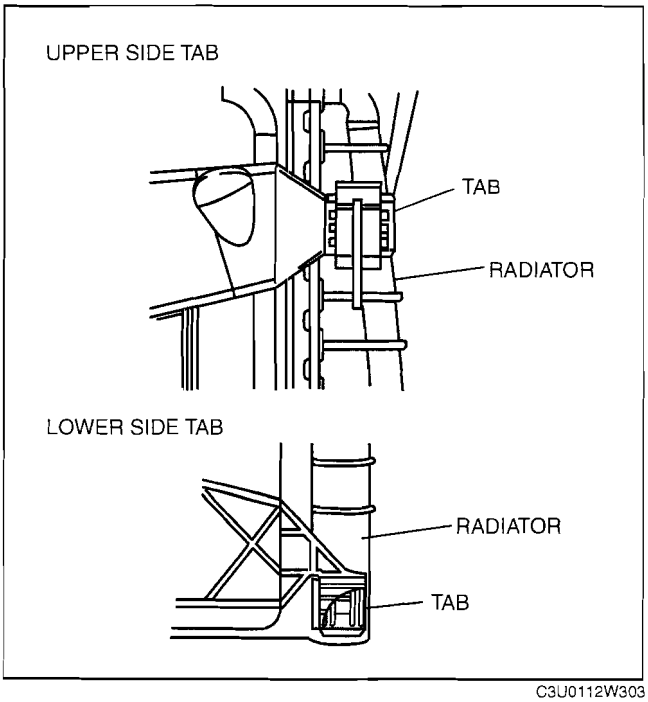
1. Install the condenser to the radiator by aligning lower side tabs b with the radiator side tabs, install upper tabs b, then install lower side tabs b.
2. Install the radiator.



B3E0112W023

Cooling Fan Component Installation Note

1. Insert tabs a to the radiator to install the cooling fan component.



C3U0112W303

THERMOSTAT REMOVAL/INSTALLATION[LF, L3]

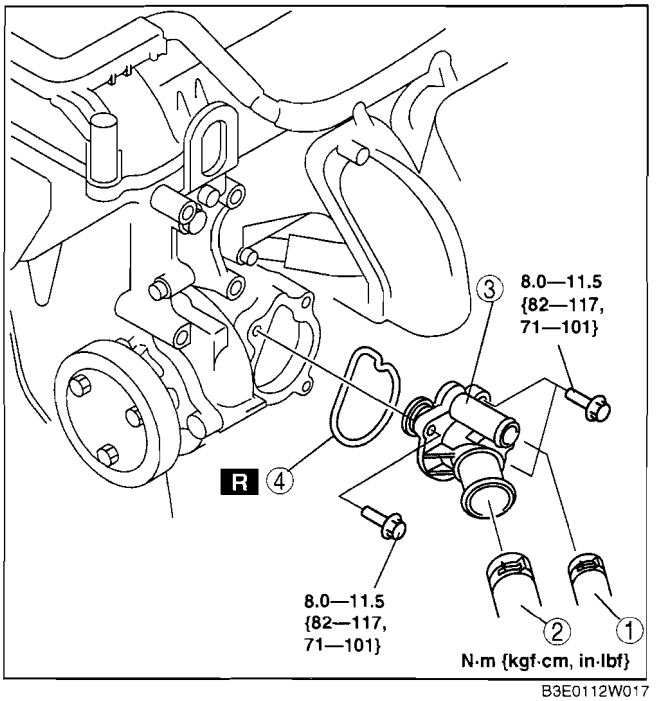
id0112c2801200

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
5. Position the coolant reserve tank out of the way.
6. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
7. Position the drive belt out of the way. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
8. Remove the drive belt tensioner. (See 01-10A-12 TIMING CHAIN REMOVAL/INSTALLATION[LF, L3].)
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Add engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
12. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)

1	Water hose
2	Lower radiator hose
3	Thermostat component
4	Gasket



B3E0112W017

THERMOSTAT INSPECTION[LF, L3]

id0112c2801300

1. Inspect the thermostat for the following.

Warning

- **During inspection, the thermostat and water are extremely hot and can cause severe burns. Do not touch the thermostat and water.**

- The valve should not open under normal temperature.
- Opening temperature and valve lift
  — If there is a malfunction, replace the thermostat.

Item		Specification
Initial-opening temperature	(°C {°F})	80—84 {176—183}
Full-open temperature	(°C {°F})	97 {207}
Full-open lift	(mm {in})	8.0 {0.31} or more

WATER PUMP REMOVAL/INSTALLATION[LF, L3]

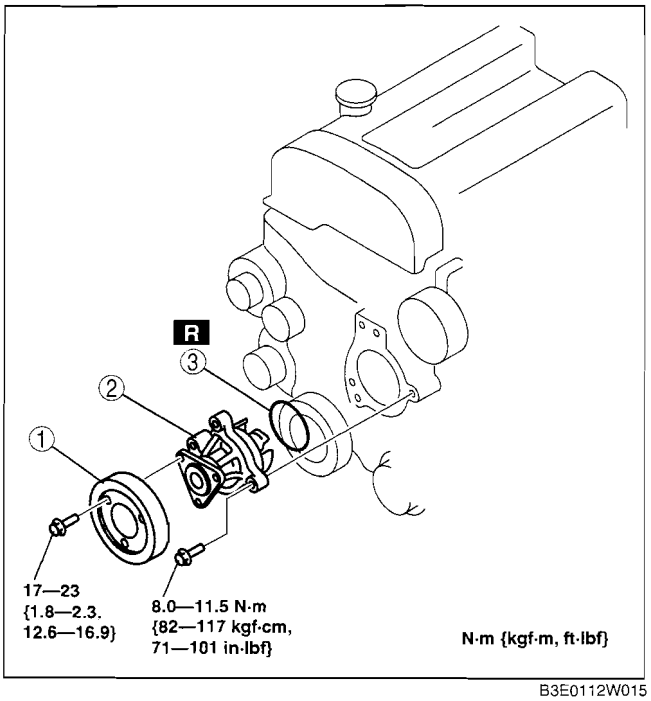
id0112c2800700

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
5. Position the coolant reserve tank out of the way.
6. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
7. Loosen the water pump pulley bolt and position the drive belt out of the way. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Add engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
11. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)

1	Water pump pulley
2	Water pump
3	O-ring



B3E0112W015

COOLING FAN MOTOR COMPONENT INSPECTION[LF, L3]

id0112c2802000

1. Perform the cooling fan control system inspection. (See 01-03A-68 ENGINE CONTROL SYSTEM OPERATION INSPECTION[LF, L3].)
   - If the cooling fan control does not operate properly, inspect the following.
     - — ECT sensor
     - — A/C switch
     - — A/C refrigerant pressure switch (High/low pressure)
     - — A/C refrigerant pressure switch (Middle pressure)
     - — VSS
     - — A/C magnetic clutch
     - — Fan control module power supply circuit
     - — Fan control module ground circuit
     - — Fan control signal circuit (between fan control module terminal B and PCM terminal 1Y*1, 1W*2, 1R*3)
       - If the all items are normal, replace the cooling fan component.

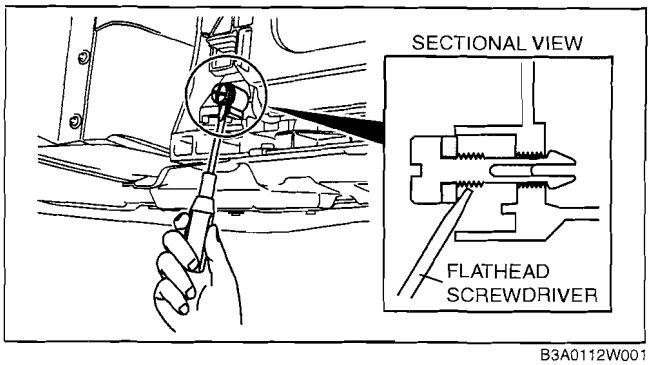
*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF ATX
*3 : Except for California emission regulation applicable model with LF MTX, L3

RADIATOR DRAIN PLUG REPLACEMENT[LF, L3]

id0112c2802100

1. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
2. Loosen the radiator drain plug completely.
3. Using a flathead screwdriver or equivalent, pry out the radiator drain plug.

Caution
- **Do not apply excessive force to the flathead screwdriver or equivalent as doing so can damage the drain bore. Slowly and carefully pry out the radiator drain plug when removing it.**



B3A0112W001

4. Install a new radiator drain plug with a new O-ring.

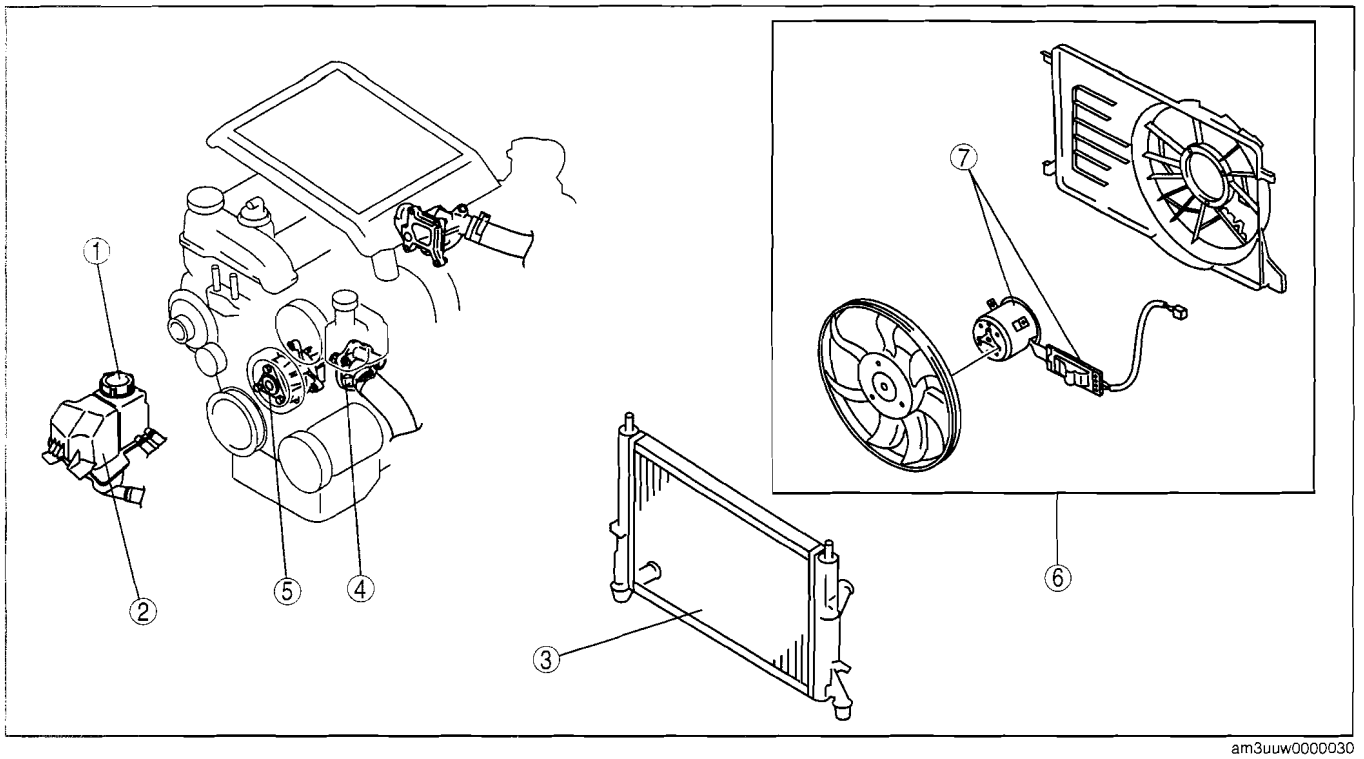
Tightening torque
1.2—1.5 N·m {13—15 kgf·cm, 11—13 in·lbf}

5. Add engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)

01-12B COOLING SYSTEM [L3 WITH TC]

COOLING SYSTEM LOCATION INDEX[L3 WITH TC]

id011239800100



am3uuw0000030

1	Cooling system cap (See 01-12B-6 COOLING SYSTEM CAP INSPECTION[L3 WITH TC].)
2	Coolant reserve tank (See 01-12B-3 ENGINE COOLANT LEVEL INSPECTION[L3 WITH TC].) (See 01-12B-7 COOLANT RESERVE TANK REMOVAL/INSTALLATION[L3 WITH TC].)
3	Radiator (See 01-12B-4 ENGINE COOLANT PROTECTION INSPECTION[L3 WITH TC].) (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].) (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].) (See 01-12B-7 RADIATOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-12B-13 RADIATOR DRAIN PLUG REPLACEMENT[L3 WITH TC].)

4	Thermostat (See 01-12B-10 THERMOSTAT REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-12B-11 THERMOSTAT INSPECTION[L3 WITH TC].)
5	Water pump (See 01-12B-12 WATER PUMP REMOVAL/ INSTALLATION[L3 WITH TC].)
6	Cooling fan component (See 01-12B-7 RADIATOR REMOVAL/ INSTALLATION[L3 WITH TC].)
7	Cooling fan motor component (See 01-12B-12 COOLING FAN MOTOR COMPONENT INSPECTION[L3 WITH TC].)

COOLING SYSTEM SERVICE WARNINGS[L3 WITH TC]

id011239800200

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**
- **Depending on the vehicle, the cooling fan may operate suddenly even when the ignition switch is turned off. Therefore, keep hands and tools away from the cooling fan even if the cooling fan is not operating to prevent injury to personnel or damage to the cooling fan. Always disconnect the negative battery cable when servicing the cooling fan or parts near the cooling fan.**

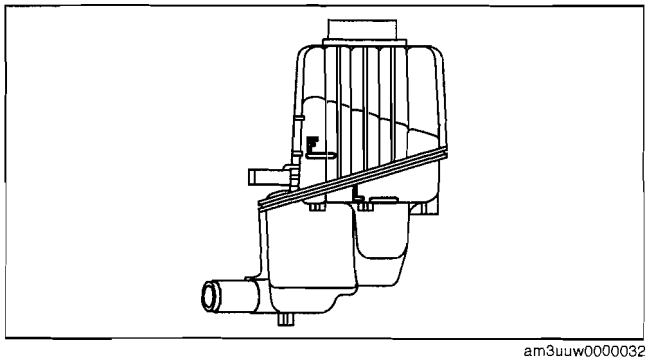
ENGINE COOLANT LEVEL INSPECTION[L3 WITH TC]

id011239800300

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Verify that the engine coolant level in the coolant reserve tank is between the F and L marks.
   - If the engine coolant level is below the L mark, add engine coolant.



am3uuw0000032

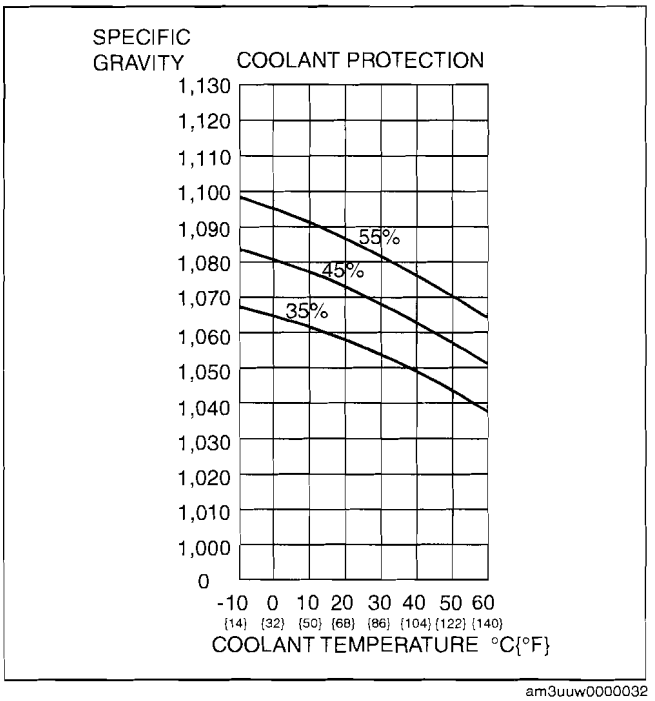
ENGINE COOLANT PROTECTION INSPECTION[L3 WITH TC]

id011239800400

1. Measure the engine coolant temperature and specific gravity using a thermometer and a hydrometer.

Caution
- **Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.**
- **The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.**
- **Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**
- **Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.**

2. Determine the engine coolant protection level by referring to the graph shown in the figure.
   - If the engine coolant protection level is not correct, add water or engine coolant.



am3uuw0000032

ENGINE COOLANT REPLACEMENT[L3 WITH TC]

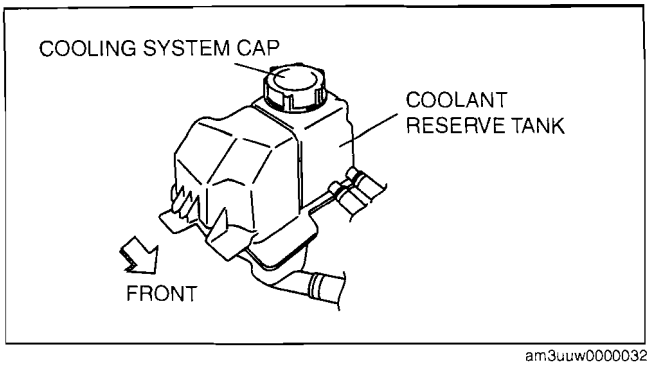
id011239800600

Warning
- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

Caution
- **Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.**
- **The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.**
- **Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**
- **Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.**

Engine coolant capacity (approx. quantity)
7.5 L {7.9 US qt, 6.6 Imp qt}

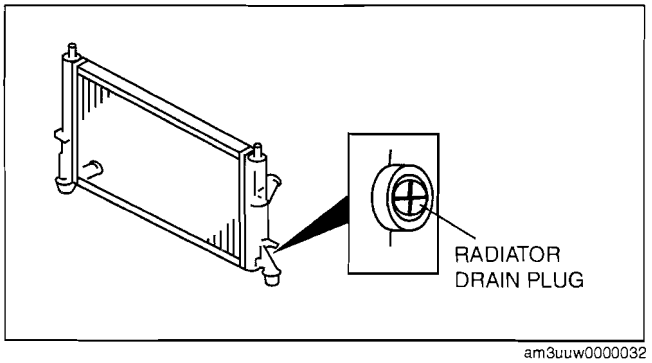
1. Remove the cooling system cap.
2. Remove the under cover.



am3uuw0000032

3. Loosen the radiator drain plug and drain the engine coolant into a container.
4. Flush the cooling system with water until all traces of color are gone.
5. Let the system drain completely.
6. Tighten the radiator drain plug.

Tightening torque
1.2—1.5 N·m {13—15 kgf·cm, 11—13 in·lbf}



am3uuw0000032

7. Referring to the following chart, select the correct volume percentage of the water and engine coolant.

Antifreeze solution mixture percentage

Engine coolant protection	Volume percentage (%)		Gravity at 20 °C {68 °F}
	Water	Coolant	
Above -16 °C {3 °F}	65	35	1.057
Above -26 °C {-15 °F}	55	45	1.072
Above -40 °C {-40 °F}	45	55	1.086

8. Refill the engine coolant into the coolant reserve tank up to the F mark on the tank.
9. Fully install the cooling system cap.

Caution
- **If the water temperature gauge rises too high, stop the engine and decrease the engine coolant temperature to prevent overheating. Then, verify the malfunctioning part and repair or replace it.**
- **If the engine coolant level in the coolant reserve tank is below the L mark during engine coolant air bleeding operation, stop the engine, and after the engine coolant temperature decreases, add engine coolant. Then, resume the engine coolant air bleeding operation.**

10. Start the engine and idle it until the thermometer indicator is in the center when the engine is at **below 1,500 rpm**.
11. Bleed the air by following the procedures below. At this time, be careful of the coolant temperature to prevent overheating.

Note
- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

(1) Run the engine at **2,500 rpm** for **2—3 min**, **2 times**.
(2) Run the engine at **3,000 rpm** for **5 s**, then idle.
(3) Repeat steps (1), (2) twice.

12. Stop the engine, and inspect the coolant level after the coolant temperature decreases (water temperature gauge indicates 'C' or less).
13. Check the coolant level.
    - If it is low, refill the coolant into the coolant reserve tank up to the F mark on the tank.
14. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
15. Install the under cover.

ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC]

id011239800500

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Inspect the engine coolant level. (See 01-12B-3 ENGINE COOLANT LEVEL INSPECTION[L3 WITH TC].)
2. Remove the cooling system cap.
3. Install the **SST** or aftermarket equivalent and a radiator cap tester to the coolant reserve tank filler port.
4. Apply pressure using the radiator cap tester.

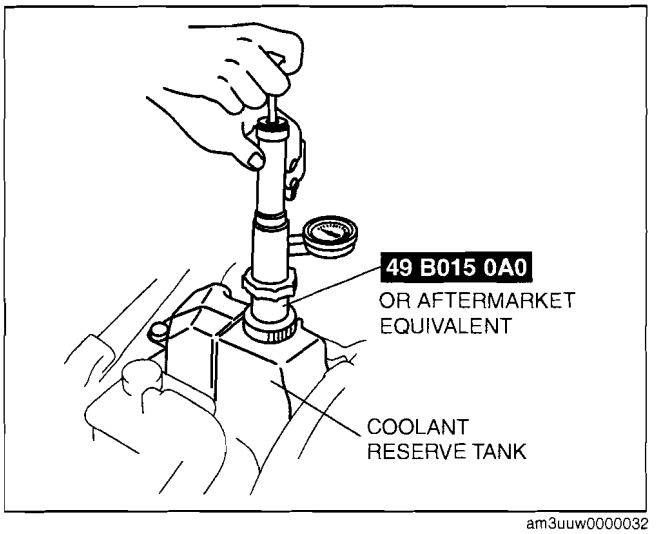
Caution

- **Applying more than 145 kPa {1.5 kgf/cm^2, 21 psi} can damage the hoses, fittings, and other components, and cause leakage.**

Pressure

145 kPa {1.5 kgf/cm^2, 21 psi} [1 min]

5. When pressurizing the cooling system, verify that the pressure is maintained.
   - If the gauge needle drops, it may indicate water leakage. Repair or replace the applicable part.



am3uuw0000032

COOLING SYSTEM CAP INSPECTION[L3 WITH TC]

id011239801500

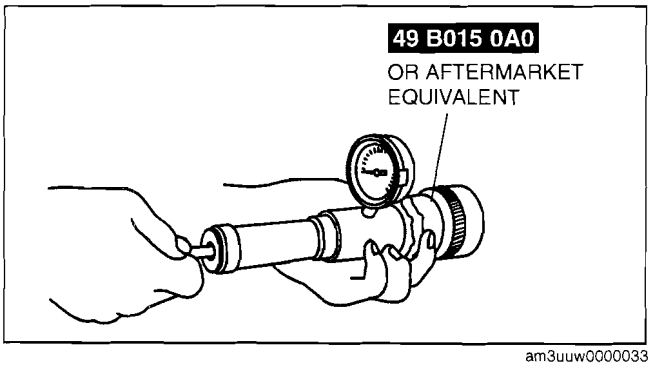
Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Clean the cooling system cap and the sealed part.
2. Inspect the cooling system cap for cracks or everted seal.
   - If there is any malfunction, replace the cooling system cap.
3. Attach the cooling system cap to the **SST** and a radiator cap tester.
4. Hold the cooling system cap downward and apply pressure gradually. Verify that the pressure is held stable for **10 s.**
   - If the pressure is not held stable, replace the cooling system cap.

Cooling system cap valve opening pressure

135—155 kPa {1.38—1.58 kgf/cm^2, 19.6—22.4 psi}



am3uuw0000033

COOLANT RESERVE TANK REMOVAL/INSTALLATION[L3 WITH TC]

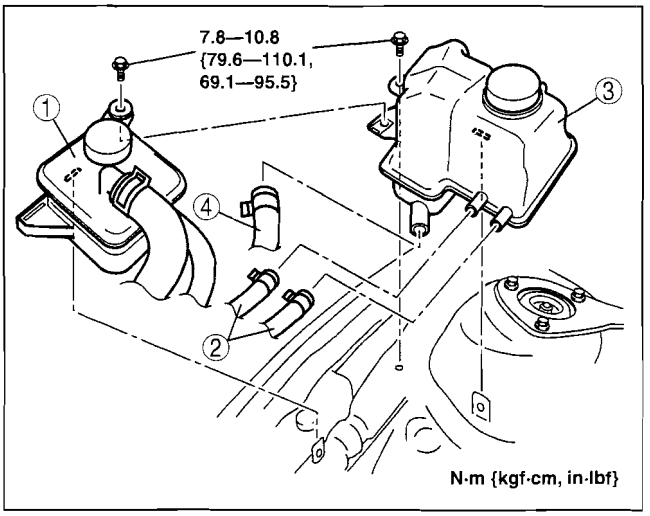
id011239801000

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Remove the under cover.
2. Drain the engine coolant until the coolant reserve tank becomes empty. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
6. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].).

1	P/S fluid reserve tank (See 01-12B-7 P/S Fluid Reserve Tank Removal Note.)
2	Hose
3	Coolant reserve tank
4	Hose



am3uuw0000032

P/S Fluid Reserve Tank Removal Note

1. Remove the P/S fluid reserve tank with the hoses still connected. Position the P/S fluid reserve tank out of the way.

RADIATOR REMOVAL/INSTALLATION[L3 WITH TC]

id011239801400

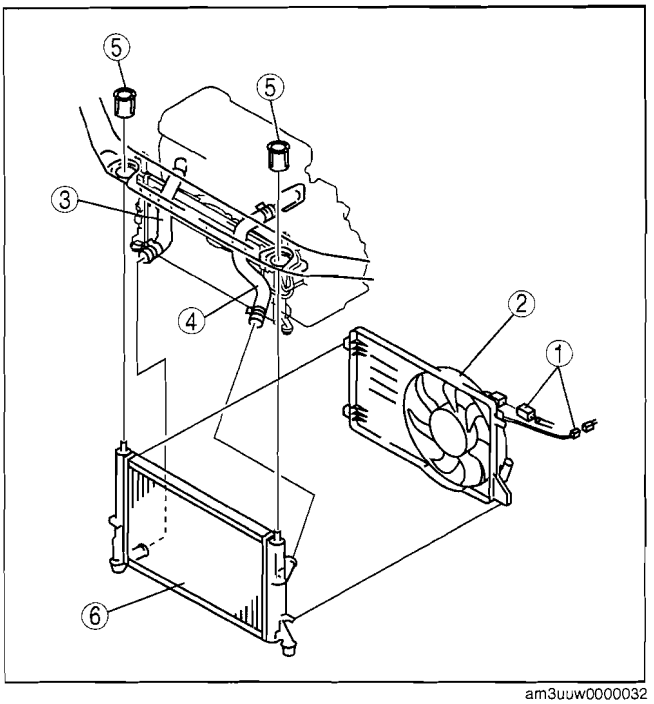
Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
5. Remove the air cleaner. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
6. Disconnect the coolant reserve tank hose from the radiator.
7. Position the front wiring harnesses out of the way.
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Refill the engine coolant.(See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)

11. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].).

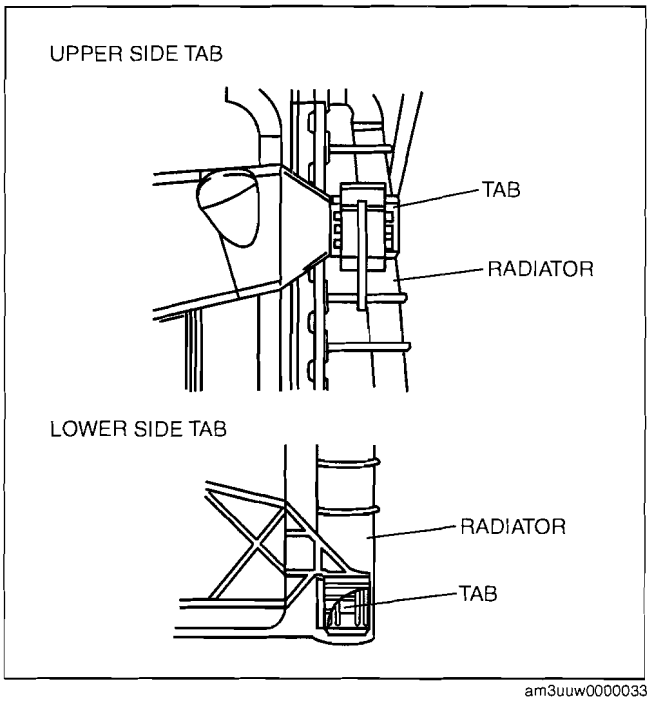
1	Fan control module connector
2	Cooling fan component (See 01-12B-8 Cooling Fan Component Removal Note.) (See 01-12B-10 Cooling Fan Component Installation Note.)
3	Radiator lower hose
4	Radiator upper hose
5	Upper mount rubber
6	Radiator (See 01-12B-9 Radiator Removal Note.) (See 01-12B-9 Radiator Installation Note.)



am3uuw0000032

Cooling Fan Component Removal Note

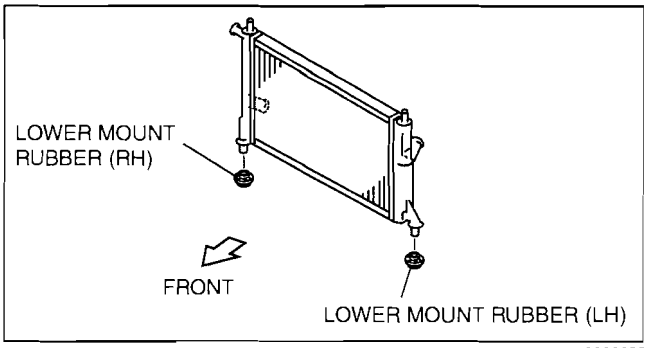
1. Unlock lower side tabs at two points by pressing the cooling fan side tabs, remove upper side tabs at two points, then remove the cooling fan component from the radiator.



am3uuw0000033

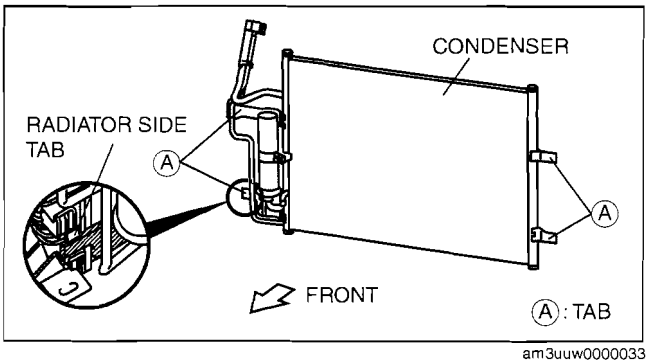
Radiator Removal Note

1. Tilt the radiator to the engine side.
2. While lifting the radiator, remove the lower mount rubber (LH) from the mount installation hole.
3. While lifting the radiator, remove the lower mount rubber (RH) from the mount installation hole.



am3uuw0000033

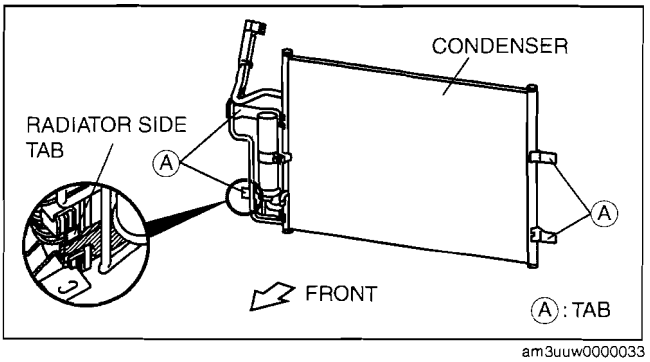
4. Remove the condenser from the radiator with the pipes still connected, by pressing the radiator side tab to unlock the tab A on the condenser.
5. Remove the radiator from below.



am3uuw0000033

Radiator Installation Note

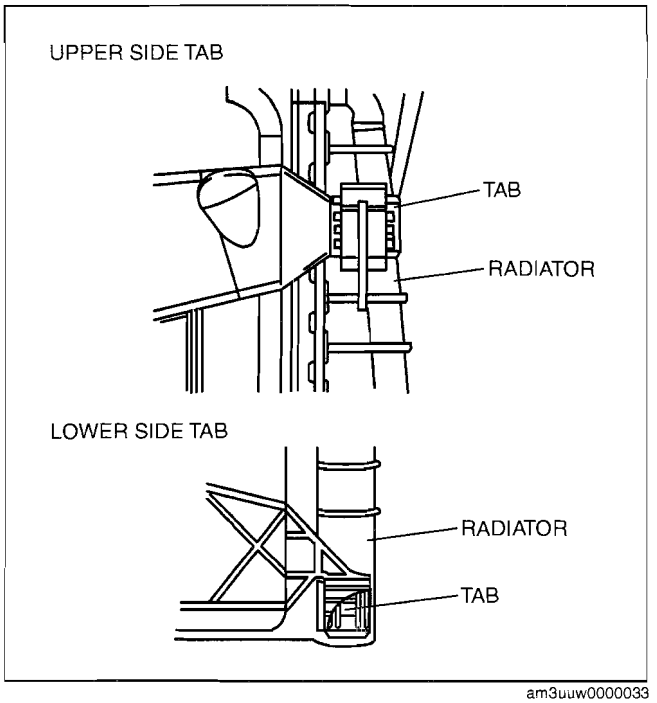
1. Install the condenser to the radiator by aligning lower side tab A with the radiator side tab, install upper tab A, then install lower side tab A.
2. Install the radiator.



am3uuw0000033

Cooling Fan Component Installation Note

1. Insert tabs to the radiator to install the cooling fan component.



am3uuw0000033

THERMOSTAT REMOVAL/INSTALLATION[L3 WITH TC]

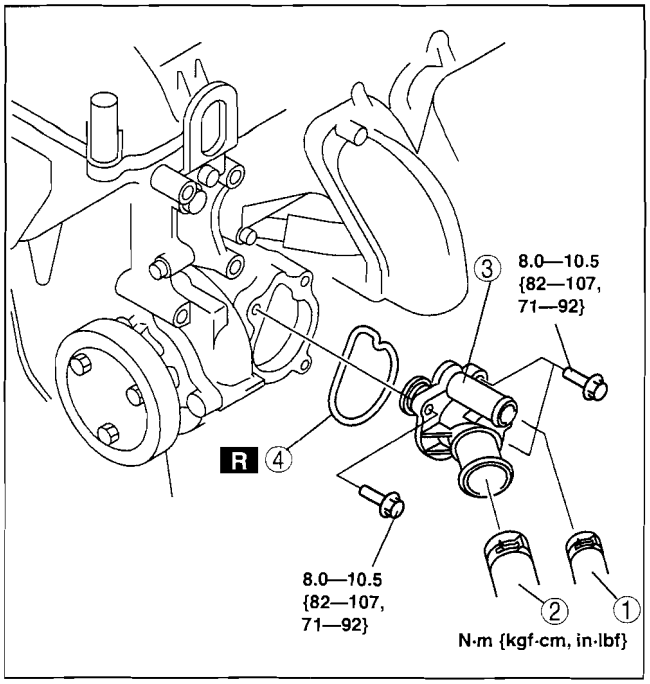
id011239801200

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
5. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove the P/S oil pump with hose and pipe still connected. Position the P/S oil pump out of the way. (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
11. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)

1	Water hose
2	Lower radiator hose
3	Thermostat component
4	Gasket



am3uuw0000101

THERMOSTAT INSPECTION[L3 WITH TC]

id011239801300

1 Inspect the thermostat for the following.

Warning
- **During inspection, the thermostat and water are extremely hot and can cause severe burns. Do not touch the thermostat and water.**

- The valve should not open under normal temperature.
- Opening temperature and valve lift
  — If there is a malfunction, replace the thermostat.

Thermostat initial-opening temperature
80—84 °C {176—183 °F}

Thermostat full-open temperature
97 °C {207 °F}

Thermostat full-open lift
More than 8.0 mm {0.31 in}

WATER PUMP REMOVAL/INSTALLATION[L3 WITH TC]

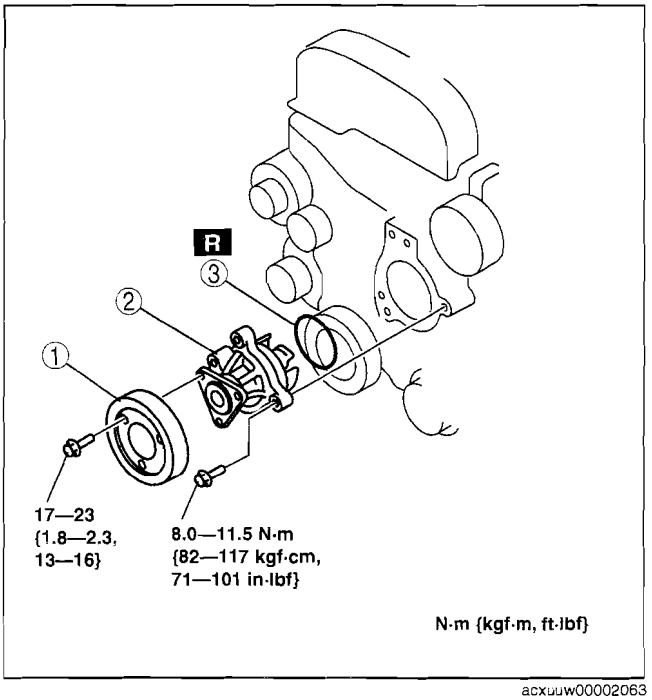
id011239800700

Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
5. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
6. Loosen the water pump pulley bolts before removing the drive belt.
7. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
8. Remove the P/S oil pump with hose and pipe still connected. Position the P/S oil pump out of the way. (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
12. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].).

1	Water pump pulley
2	Water pump
3	O-ring (See 01-12B-12 O-ring Installation Note.)



acxbuw00002063

O-ring Installation Note

1. Apply engine coolant to a new O-ring.
2. Install the O-ring.

COOLING FAN MOTOR COMPONENT INSPECTION[L3 WITH TC]

id011239802000

1. Perform the cooling fan control system inspection. (See 01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].)
   - If the cooling fan control does not operate properly, inspect the following.
     - — ECT sensor
     - — A/C switch
     - — A/C refrigerant pressure switch (High/low pressure)
     - — A/C refrigerant pressure switch (Middle pressure)
     - — VSS
     - — A/C magnetic clutch
     - — Fan control module power supply circuit
     - — Fan control module ground circuit
     - — Fan control signal circuit (between fan control module terminal B and PCM terminal 1AE)
       - If the all items are normal, replace the cooling fan component.

RADIATOR DRAIN PLUG REPLACEMENT[L3 WITH TC]

id011239802100

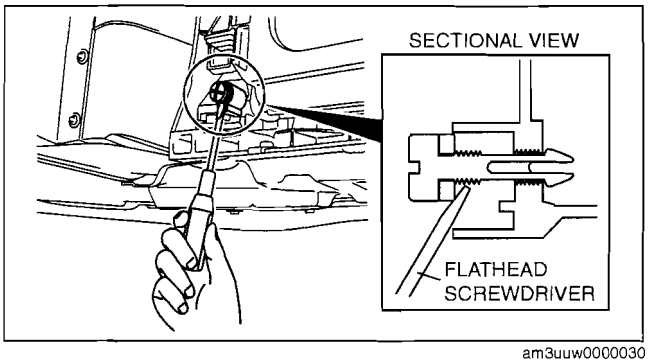
Warning

- **Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, turn the cap using the cloth, and remove it.**

1. Remove the under cover.
2. Drain the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
3. Loosen the radiator drain plug completely.
4. Using a flathead screwdriver or equivalent, pry out the radiator drain plug.

Caution

- **Do not apply excessive force to the flathead screwdriver or equivalent as doing so can damage the drain bore. Slowly and carefully pry out the radiator drain plug when removing it.**



am3uuw0000030

5. Install a new radiator drain plug with a new O-ring.

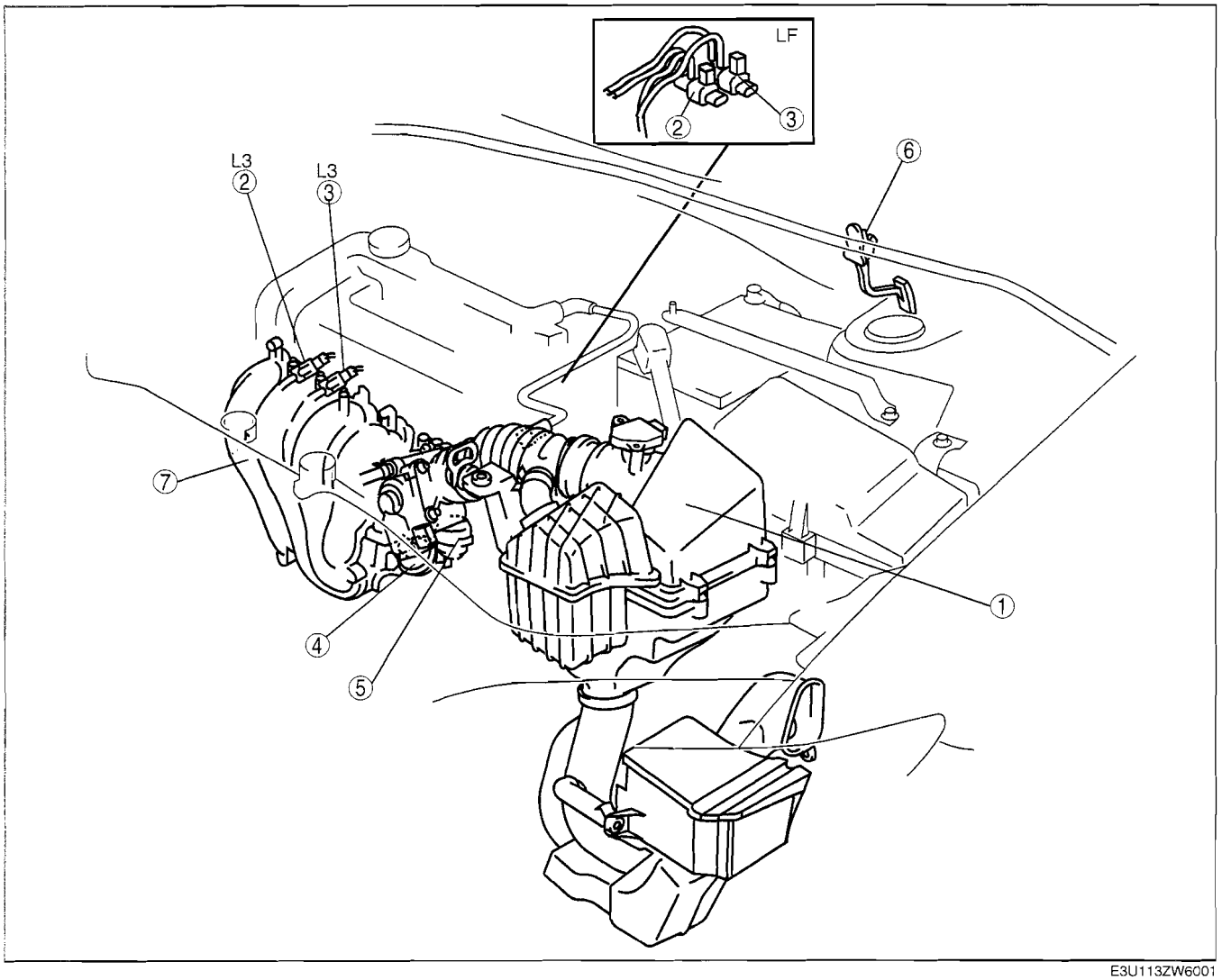
Tightening torque
1.2—1.5 N·m {13—15 kgf·cm, 11—13 in·lbf}

6. Refill the engine coolant. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
7. Inspect for engine coolant leakage. (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
8. Install the under cover.

01-13A INTAKE-AIR SYSTEM [LF, L3]

INTAKE AIR SYSTEM LOCATION INDEX[LF, L3]

id0113a5800100



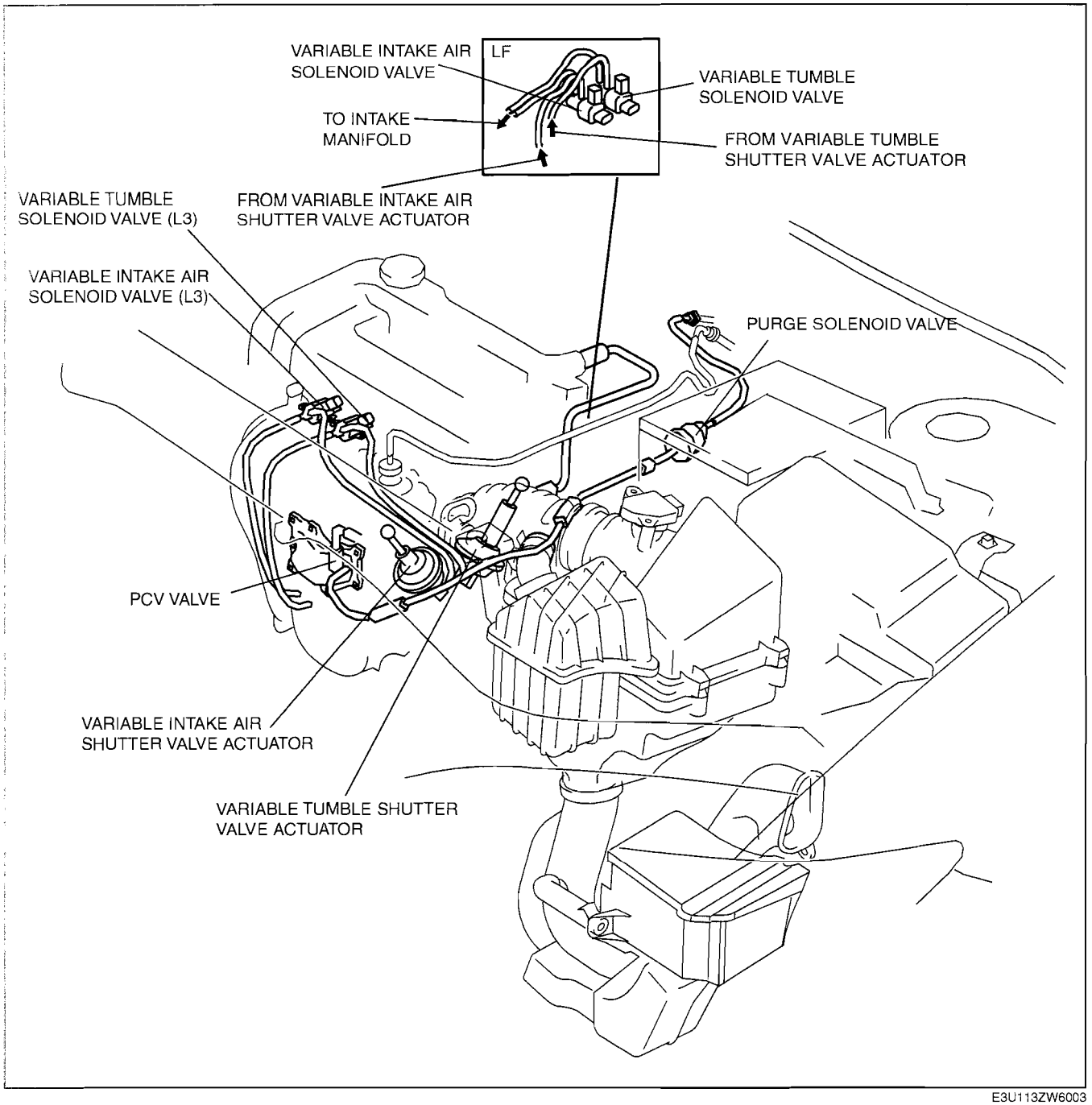
E3U113ZW6001

1	Air cleaner (See 01-13A-6 AIR CLEANER ELEMENT INSPECTION[LF, L3].)
2	Variable intake air solenoid valve (See 01-13A-8 VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION[LF, L3].)
3	Variable tumble solenoid valve (See 01-13A-9 VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3].)
4	Variable intake air shutter valve actuator (See 01-13A-10 VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].)

5	Variable tumble shutter valve actuator (See 01-13A-10 VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION[LF, L3].)
6	Accelerator pedal (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3].)
7	intake air system (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)

INTAKE AIR SYSTEM HOSE ROUTING DIAGRAM[LF, L3]

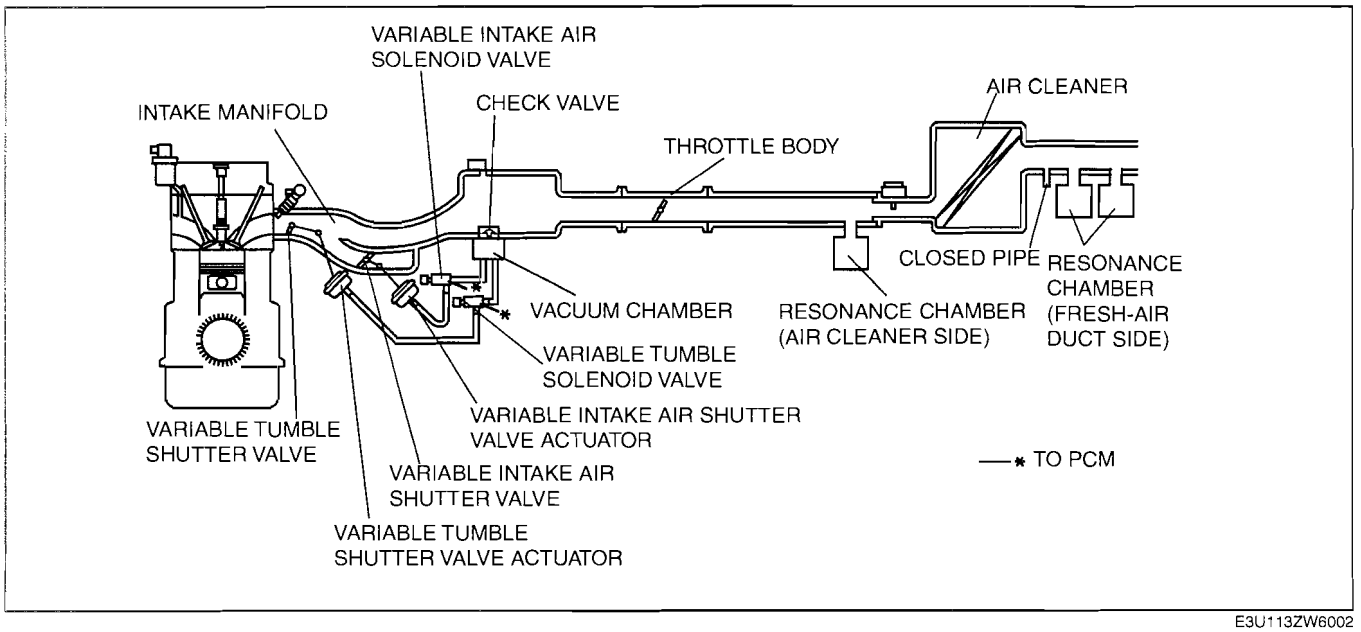
id0113a5804100



E3U113ZW6003

INTAKE AIR SYSTEM DIAGRAM[LF, L3]

id0113a5804000



E3U113ZW6002

INTAKE AIR SYSTEM MANIFOLD VACUUM INSPECTION[LF, L3]

id0113a5804200

1. Verify that the intake air hoses are installed securely.
2. Warm up the engine.
3. Disconnect the vacuum hose connecting the intake manifold and the purge solenoid valve (purge solenoid vaive side) and install the vacuum gauge. (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/ INSTALLATION[LF, L3].)
4. Measure the intake manifold vacuum while idling (no load) using the vacuum gauge.
   - If not within the specification, perform the following inspections.
     — Accelerator cable play
     — Compression pressure (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)
     — Air suction (installation areas of throttle body, fuel injector, PCV valve, intake manifold)

Note
- If any air suction exists, the change in engine speed can be made apparent by spraying the penetrant lubricating spray on the applicable part.

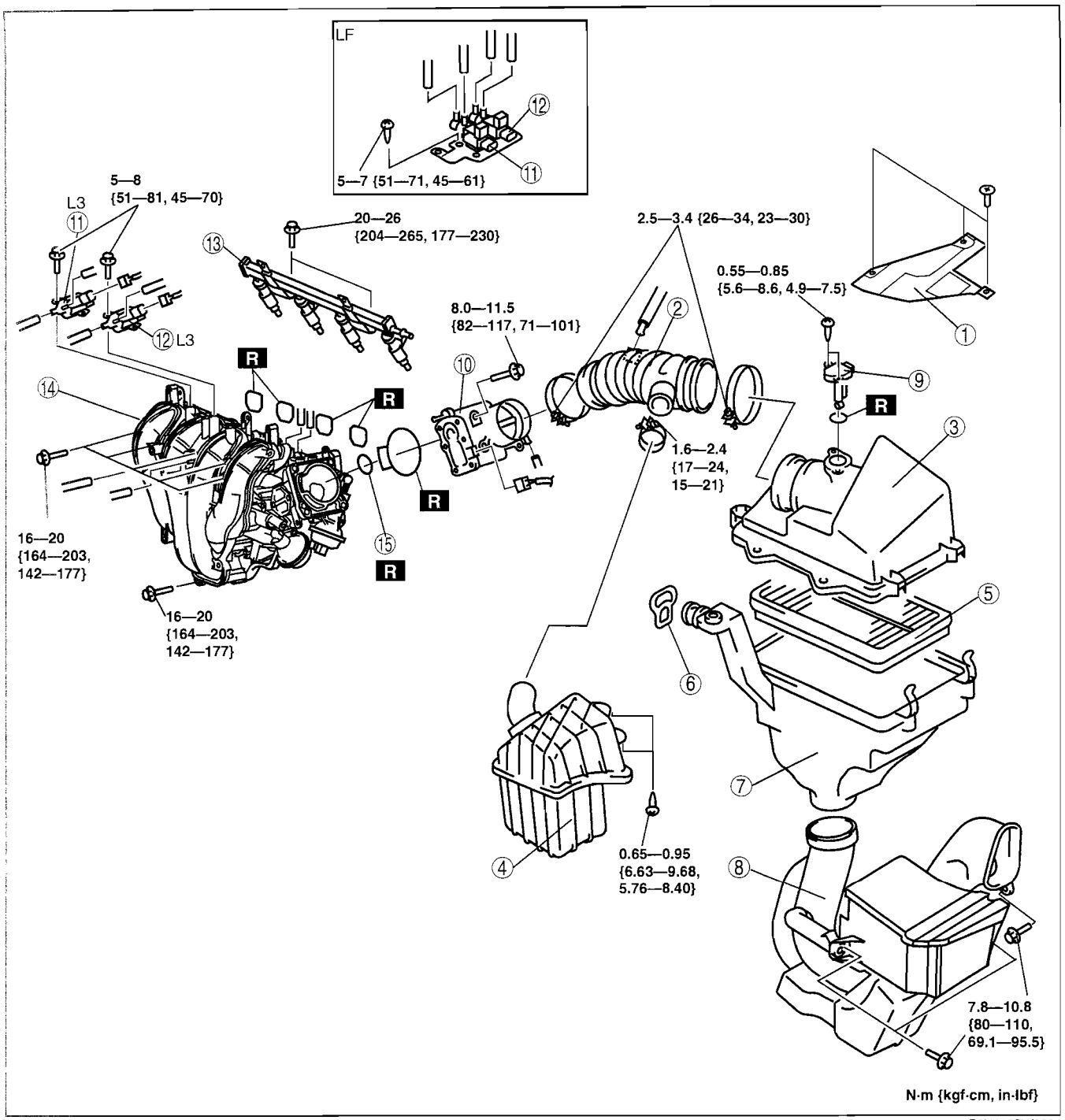
Standard
LF ATX: –55.0 kPa {–413 mmHg, –16.3 inHg} or more
LF MTX: –57.0 kPa {–428 mmHg, –16.9 inHg} or more
L3 ATX: –57.0 kPa {–428 mmHg, –16.9 inHg} or more
L3 MTX: –60.0 kPa {–451 mmHg, –17.8 inHg} or more

INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3]

id0113a5800400

Warning
- **A hot engine and intake air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake air system.**
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION". (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)**

1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery cover and battery duct. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Remove the under cover.
4. Disconnect the negative battery cable.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Complete the "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)



E3U113ZW6004

1	Intake air cover
2	Air hose (See 01-13A-6 Air Hose Installation Note.)
3	Air cleaner cover
4	Resonance chamber (Air cleaner side)
5	Air cleaner element
6	Strap (See 01-13A-6 Strap Installation Note.)
7	Air cleaner case (See 01-13A-6 Air Cleaner Case Installation Note.)
8	Fresh-air duct (See 01-13A-6 Fresh-air Duct Removal Note.)

9	MAF/IAT sensor
10	Throttle body (See 01-13A-6 Throttle Body Removal Note.)
11	Variable intake air solenoid valve
12	Variable tumble solenoid valve
13	Fuel distributor (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
14	Intake manifold (See 01-13A-6 Intake Manifold Removal Note.)
15	EGR pipe gasket

Fresh-air Duct Removal Note

1. Remove the front bumper before removing the fresh-air duct. (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)

Throttle Body Removal Note

1. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)

Intake Manifold Removal Note

1. Disconnect the vacuum hose connecting the intake manifold. (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the dipstick pipe. (See 01-11A-5 OIL PAN REMOVAL/INSTALLATION[LF, L3].)

Air Cleaner Case Installation Note

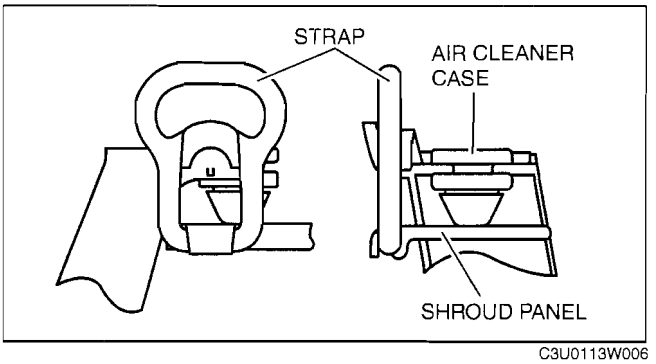
Note

- Before installing the air cleaner case, verify that the rubber mounts on the battery support bracket have not fallen off.
- When inserting the air cleaner case into the rubber mounts, applying soapy water aids the operation.

1. Verify that two rubber mounts are installed on the battery support bracket.
2. Install the air cleaner case into the rubber mounts.

Strap Installation Note

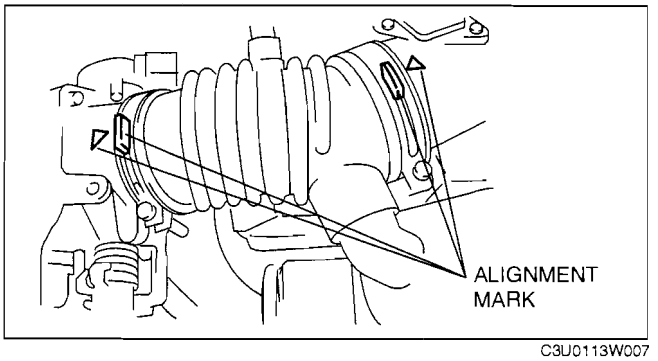
1. Using the strap, secure the shroud panel and the air cleaner case as shown in the figure.



C3U0113W006

Air Hose Installation Note

1. Align the alignment marks on the throttle body and the air hose.



C3U0113W007

AIR CLEANER ELEMENT INSPECTION[LF, L3]

id0113a5800800

1. Remove the air cleaner element. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].) (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following items:
   - If there is any abnormality, clean or replace the air cleaner element.
     - — Has the replacement interval come?
     - — Is the air cleaner element soiled, damaged, or bent?
     - — Are the air cleaner case and the air cleaner element correctly sealed?
     - — Is the correct air cleaner element installed?

THROTTLE BODY INSPECTION[LF, L3]

id0113a5802600

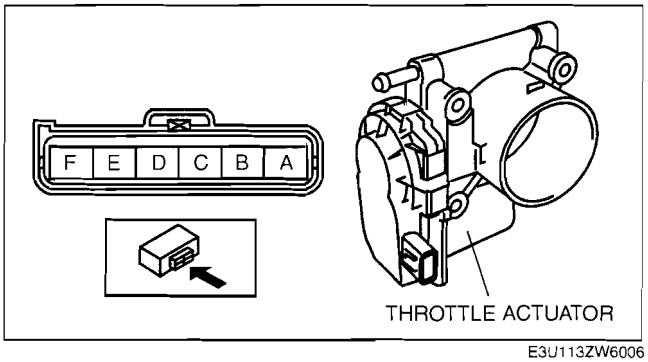
Note
- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the throttle body connector.
3. Measure the resistance between throttle actuator terminals E and F.
   - If not as specified, replace the throttle body. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].) (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   - If as specified, carry out the "Circuit Open/Short Inspection".

Specification

Ambient temperature (°C {°F})	Resistance (ohm)
Approx. 20 {68}	0.3—100



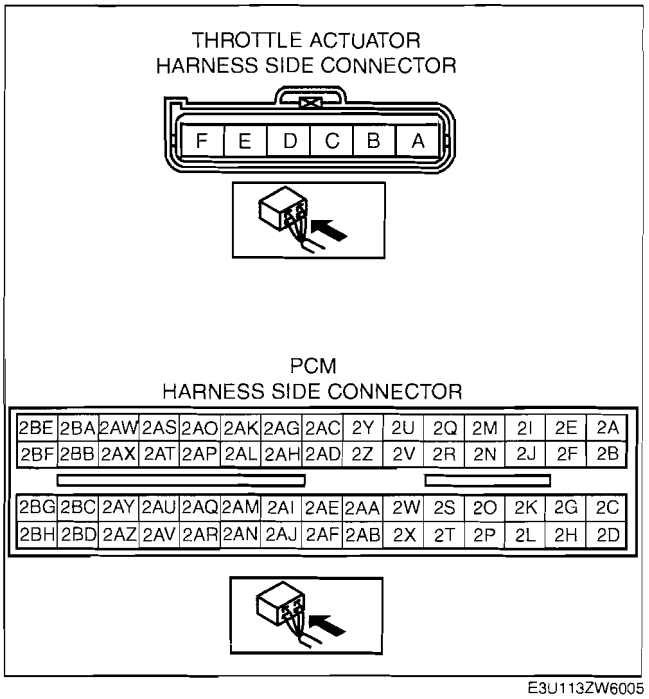
E3U113ZW6006

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harnesses for open or short (continuity check).

Open circuit
- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - — Throttle actuator terminal F and PCM terminal 2A
  - — Throttle actuator terminal E and PCM terminal 2B

Short circuit
- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - — Throttle actuator terminal F and power supply
  - — Throttle actuator terminal F and ground
  - — Throttle actuator terminal E and power supply
  - — Throttle actuator terminal E and ground



E3U113ZW6005

VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION[LF, L3]

id0113a5802800

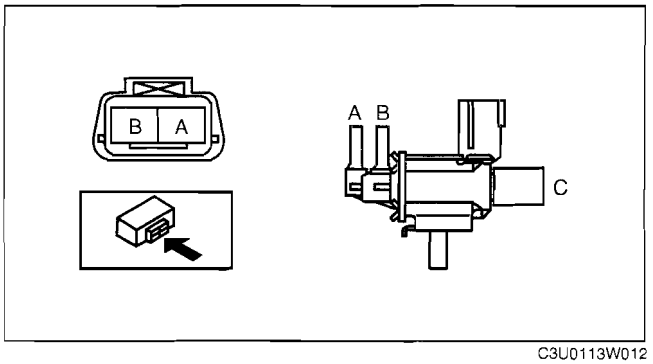
1. Remove the variable intake air solenoid valve. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the variable intake air solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○			○═○	
2	B+	GND	○═○		

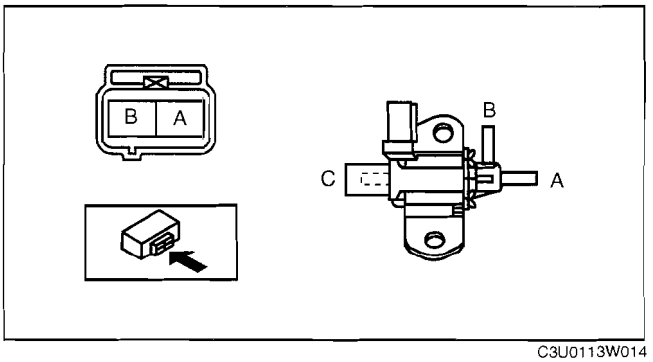
C3U0113W011

LF



C3U0113W012

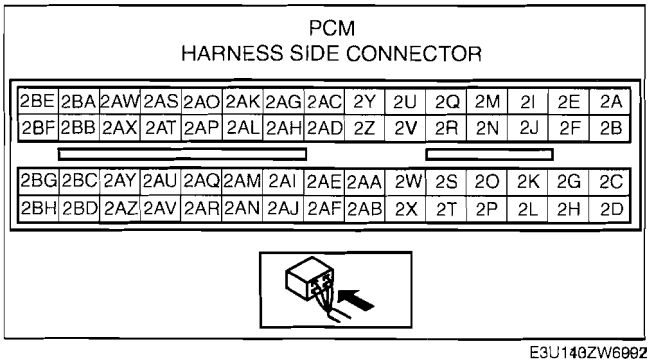
L3



C3U0113W014

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harness for open or short (continuity check).



E3U1403ZW6002

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - — Variable intake air solenoid valve terminal A and PCM terminal 2J*1, 2AJ*2
  - — Variable intake air solenoid valve terminal B and main relay terminal A

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - — Variable intake air solenoid valve terminal B and body ground
  - — Variable intake air solenoid valve terminal A and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

*2 : Except for California emission regulation applicable model with LF ATX

VARIABLE TUMBLE SOLENOID VALVE INSPECTION[LF, L3]

id0113a5802900

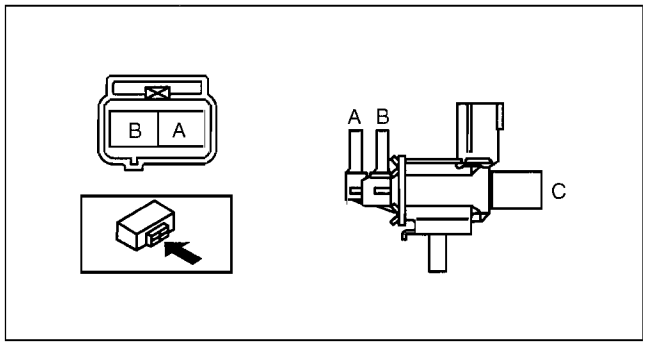
1. Remove the variable tumble solenoid valve. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the variable tumble solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○			○—○	
2	B+	GND	○═○		

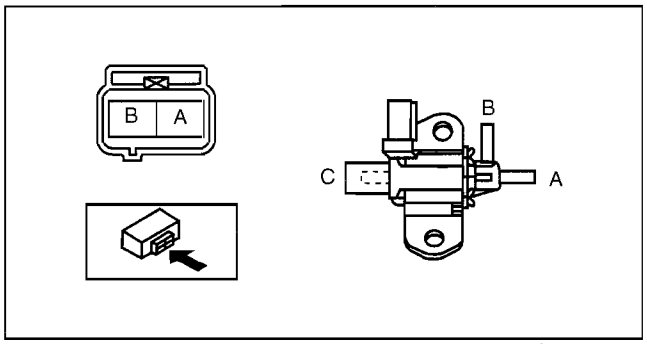
C3U0113W018

LF



C3U0113W019

L3



C3U0113W020

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harness for open or short (continuity check).

PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

E3U14GZW6890

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - — Variable tumble solenoid valve terminal B and PCM terminal 2I[*1], 2AI[*2]
  - — Variable tumble solenoid valve terminal A and main relay terminal A

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - — Variable tumble solenoid valve terminal A and body ground
  - — Variable tumble solenoid valve terminal B and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

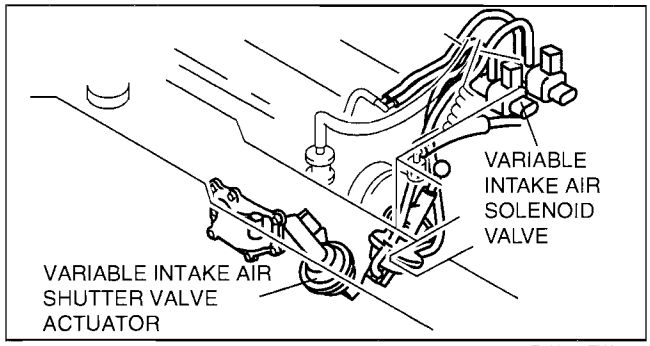
*2 : Except for California emission regulation applicable model with LF ATX

VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION[LF, L3]

id0113a5804700

1. Remove the air hose. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the vacuum hose from the variable intake air shutter valve actuator.

LF

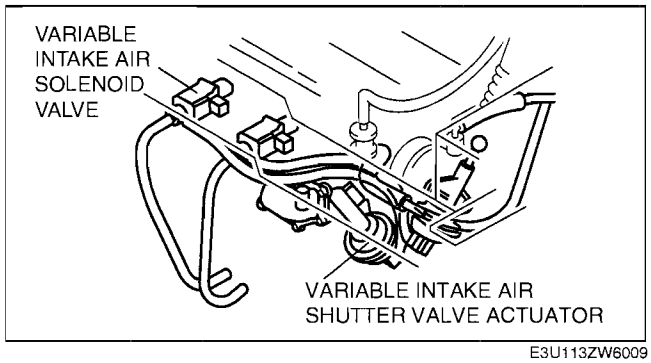


E3U113ZW6008

L3

3. Connect a vacuum pump to the variable intake air shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
   - If the rod does not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –2.7 {–21, –0.9}	Not operate
Above –33.4 {–251, –9.89}	Fully pulled



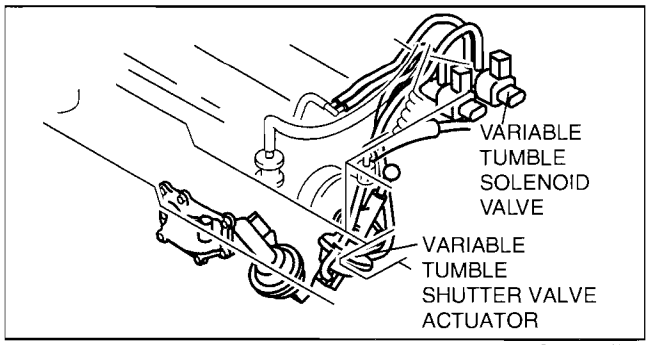
E3U113ZW6009

VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION[LF, L3]

id0113a5803100

1. Remove the air hose. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the vacuum hose from the variable tumble shutter valve actuator.

LF

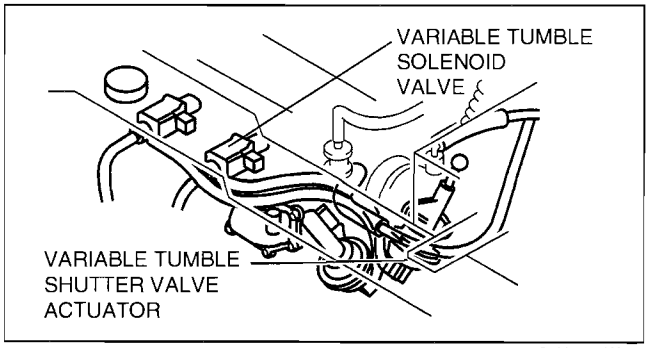


C3U0113W016

L3

3. Connect a vacuum pump to the variable tumble shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
   - If the rod does not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below –2.7 {–21, –0.9}	No operate
Above –33.4 {–251, –9.89}	Fully pulled



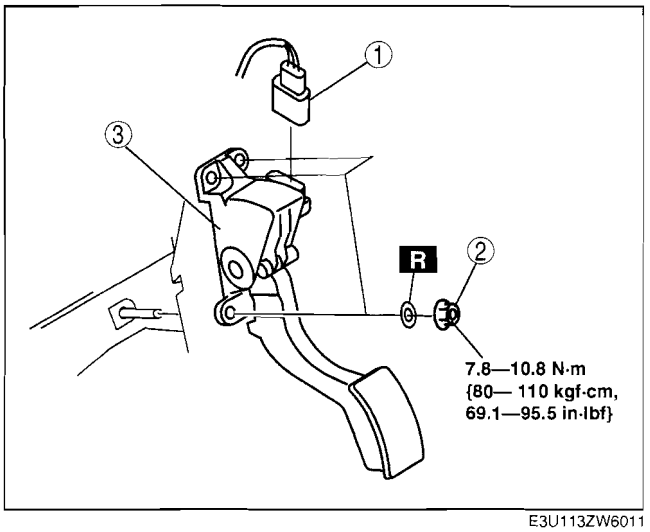
C3U0113W017

ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3]

id0113a5801400

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

1	Connector
2	Installation nut
3	Accelerator pedal

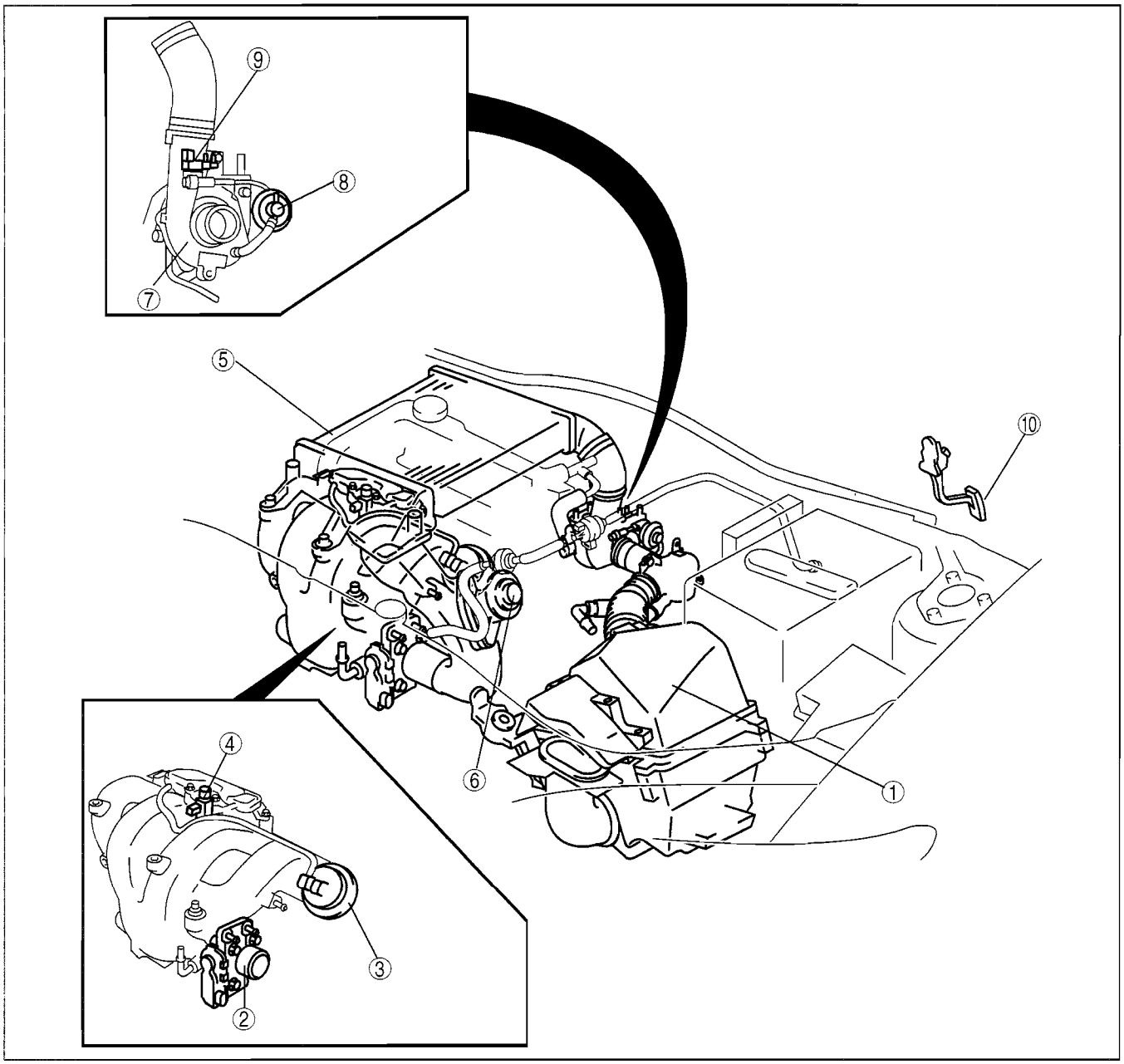


E3U113ZW6011

01-13B INTAKE-AIR SYSTEM [L3 WITH TC]

INTAKE AIR SYSTEM LOCATION INDEX[L3 WITH TC]

id011339800100



am3zzw0000349

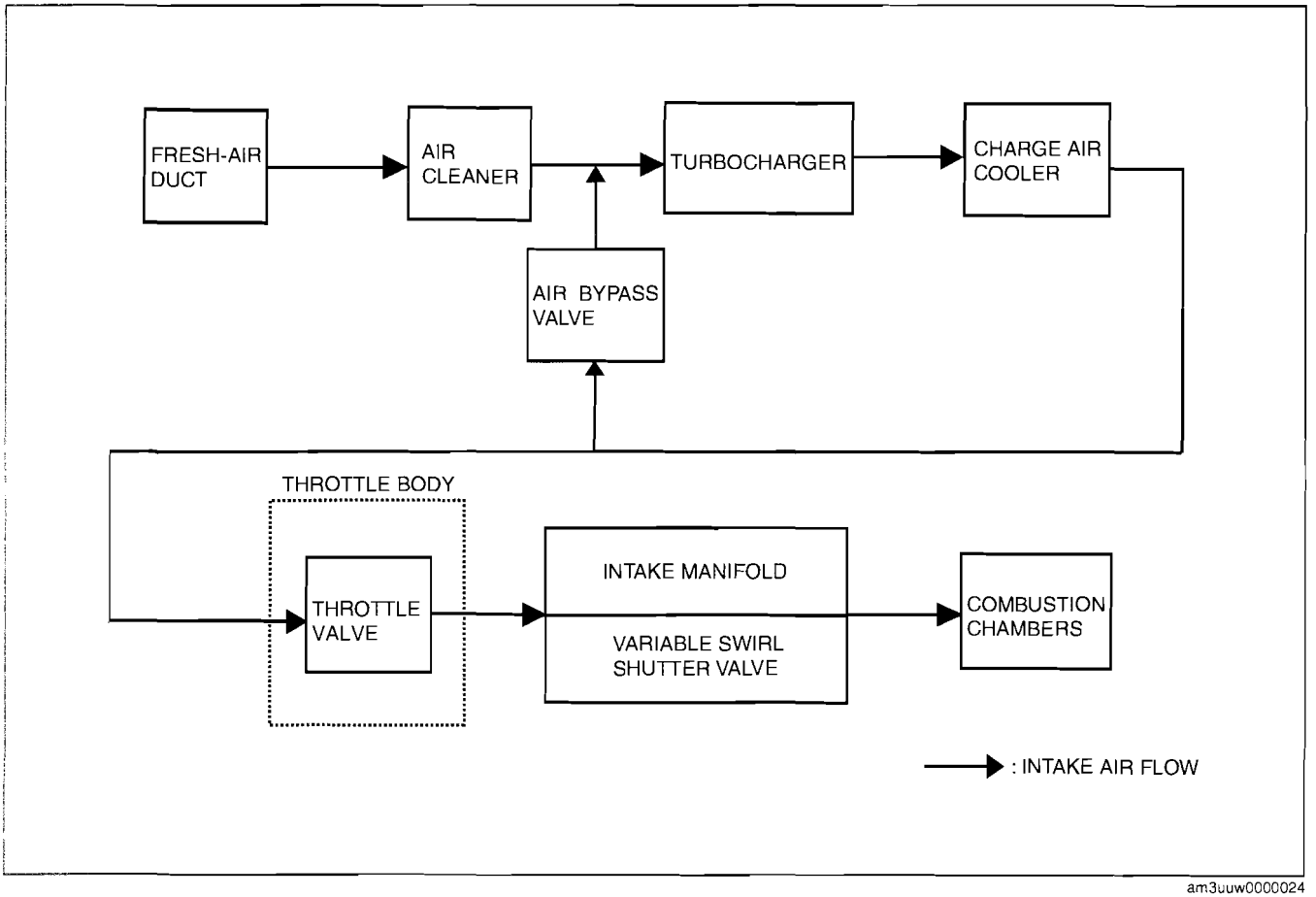
1	Air cleaner (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-12 AIR CLEANER ELEMENT INSPECTION[L3 WITH TC].)
2	Throttle body (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-13 THROTTLE ACTUATOR INSPECTION[L3 WITH TC].)
3	Variable swirl shutter valve actuator (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-14 VARIABLE SWIRL SHUTTER VALVE ACTUATOR INSPECTION[L3 WITH TC].)

4	Variable swirl solenoid valve (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-14 VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC].)
5	Charge air cooler (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-12 CHARGE AIR COOLER INSPECTION[L3 WITH TC].)
6	Air bypass valve (See 01-13B-13 AIR BYPASS VALVE INSPECTION[L3 WITH TC].)
7	Turbocharger (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-13B-18 TURBOCHARGER INSPECTION[L3 WITH TC].)

8	Wastegate actuator (See 01-13B-17 WASTEGATE ACTUATOR INSPECTION[L3 WITH TC].)
9	Wastegate control solenoid valve (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-13B-16 WASTEGATE CONTROL SOLENOID VALVE INSPECTION[L3 WITH TC].)
10	Accelerator pedal (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)

INTAKE AIR SYSTEM FLOW DIAGRAM[L3 WITH TC]

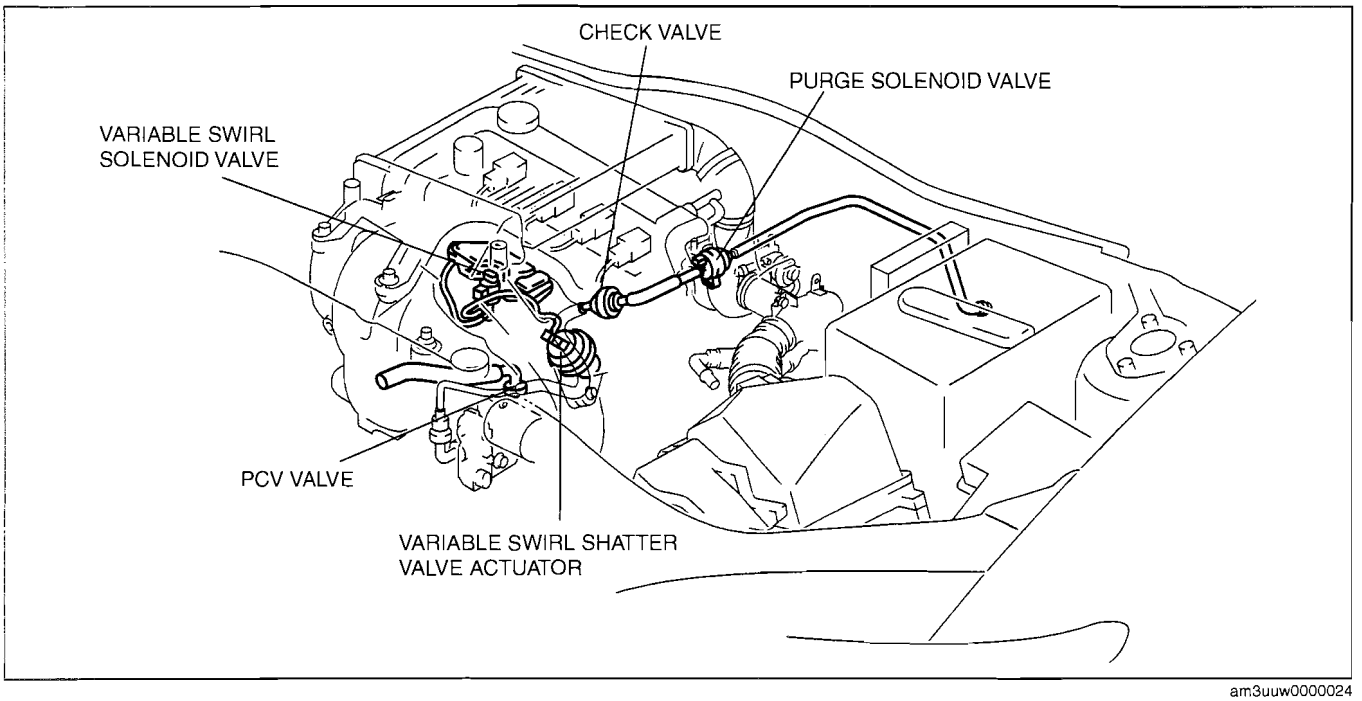
id011339800200



am3uuw0000024

VACUUM HOSE ROUTING DIAGRAM[L3 WITH TC]

id011339800300



am3uuw0000024

INTAKE AIR SYSTEM MANIFOLD VACUUM INSPECTION[L3 WITH TC]

id011339804200

1. Verify that the intake air hoses are installed securely.
2. Warm up the engine.
3. Disconnect the vacuum hose connected between the check valve and the intake manifold from the intake manifold and install the vacuum gauge. (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/ INSTALLATION[L3 WITH TC])
4. Measure the intake manifold vacuum while idling (no load) using the vacuum gauge.
   - If not within the specification, perform the following inspections.
     — Compression pressure (See 01-10B-9 COMPRESSION INSPECTION[L3 WITH TC].)
     — Air suction (installation areas of throttle body, fuel injector, PCV valve, intake manifold)

Note
- If any air suction exists, the change in engine speed can be made apparent by spraying the penetrant lubricating spray on the applicable part.

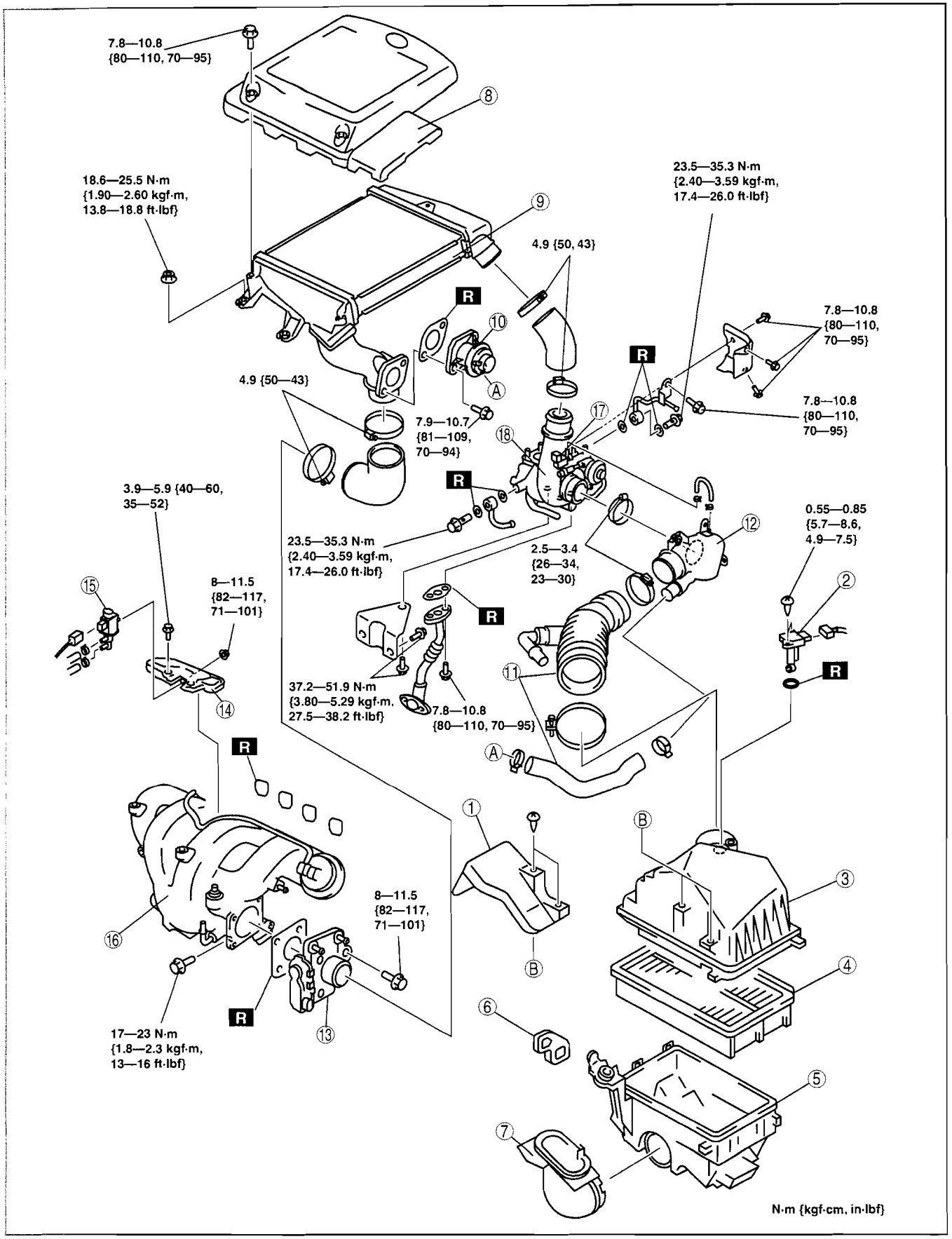
Standard
–73 kPa {–548 mmHg, –22 inHg} or more

INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC]

id011339800400

Warning
- **A hot engine and intake air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake air system.**
- **Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)**

1. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the under cover and splash shield.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Complete the "AFTER REPAIR PROCEDURE". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)



am3zzw0000339

1	Air intake cover
2	MAF/IAT sensor

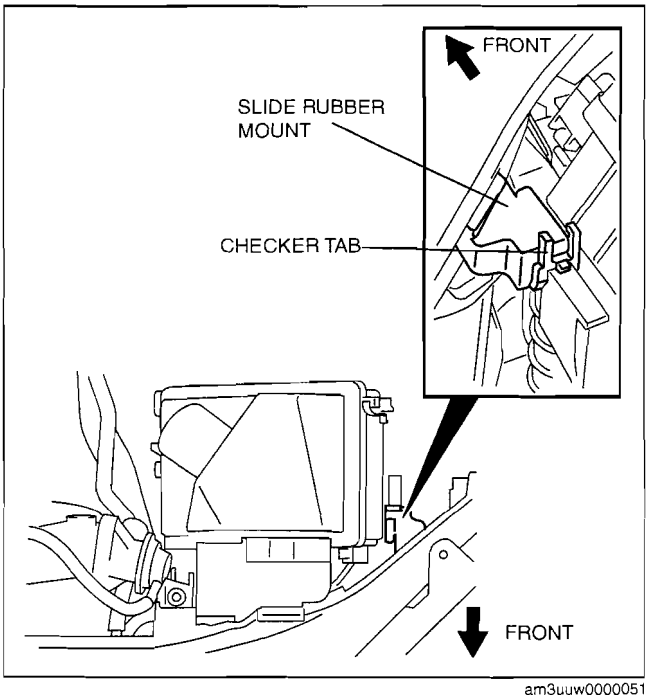
3	Air cleaner cover (See 01-13B-6 Air Cleaner Removal Note.)

4	Air cleaner element
5	Air cleaner case (See 01-13B-6 Air Cleaner Removal Note.)
6	Strap (See 01-13B-6 Air Cleaner Removal Note.) (See 01-13B-12 Strap Installation Note.)
7	Fresh-air duct
8	Charge air cooler cover
9	Charge air cooler (See 01-13B-7 Charge Air Cooler Removal Note.)
10	Air bypass valve
11	Air hose (See 01-13B-7 Air Hose Removal Note.)
12	Air duct (See 01-13B-8 Air Duct Removal Note)

13	Throttle body (See 01-13B-8 Throttle Body Removal Note.) (See 01-13B-11 Throttle Body Installation Note.)
14	Vacuum chamber
15	Variable swirl solenoid valve
16	Intake manifold (See 01-13B-8 Intake Manifold Removal Note.)
17	Wastegate control solenoid valve (See 01-13B-11 Wastegate Control Solenoid Valve Installation Note.)
18	Turbocharger (See 01-13B-8 Turbocharger Removal Note.) (See 01-13B-9 Turbocharger Installation Note.)

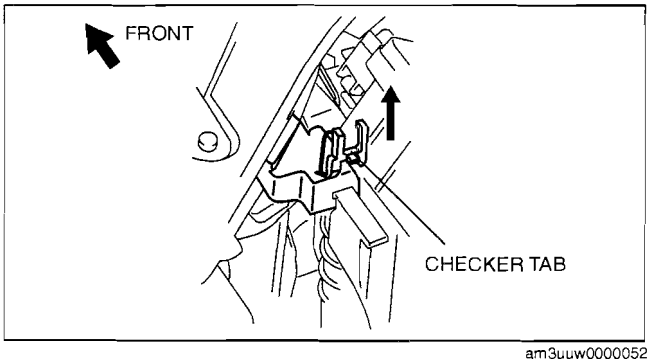
Air Cleaner Removal Note

1. Remove the slide rubber mount shown in the figure in the following procedure:



am3uuw0000051

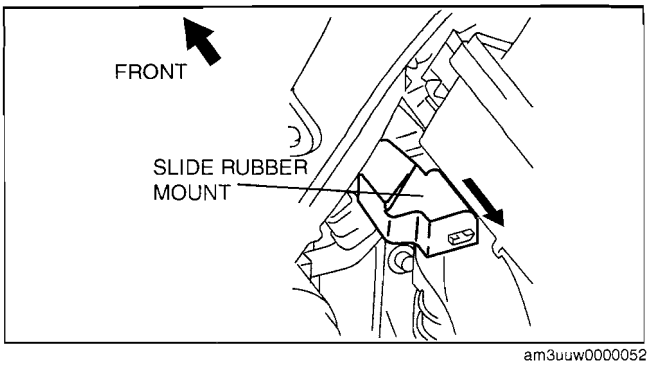
(1) Pull out the checker tab shown in the figure.



am3uuw0000052

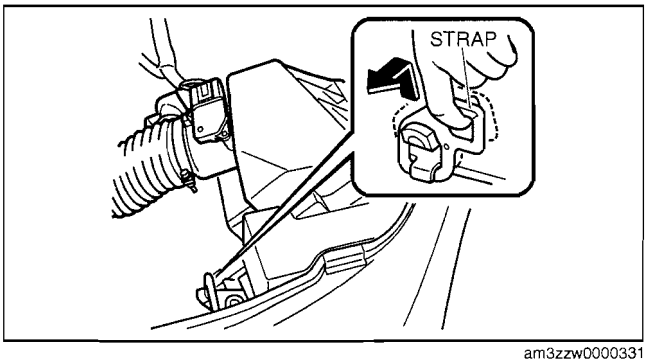
(2) Slide the slide rubber mount in the direction shown by the arrow while pulling up the rubber.

2. Remove the air cleaner.



am3uuw0000052

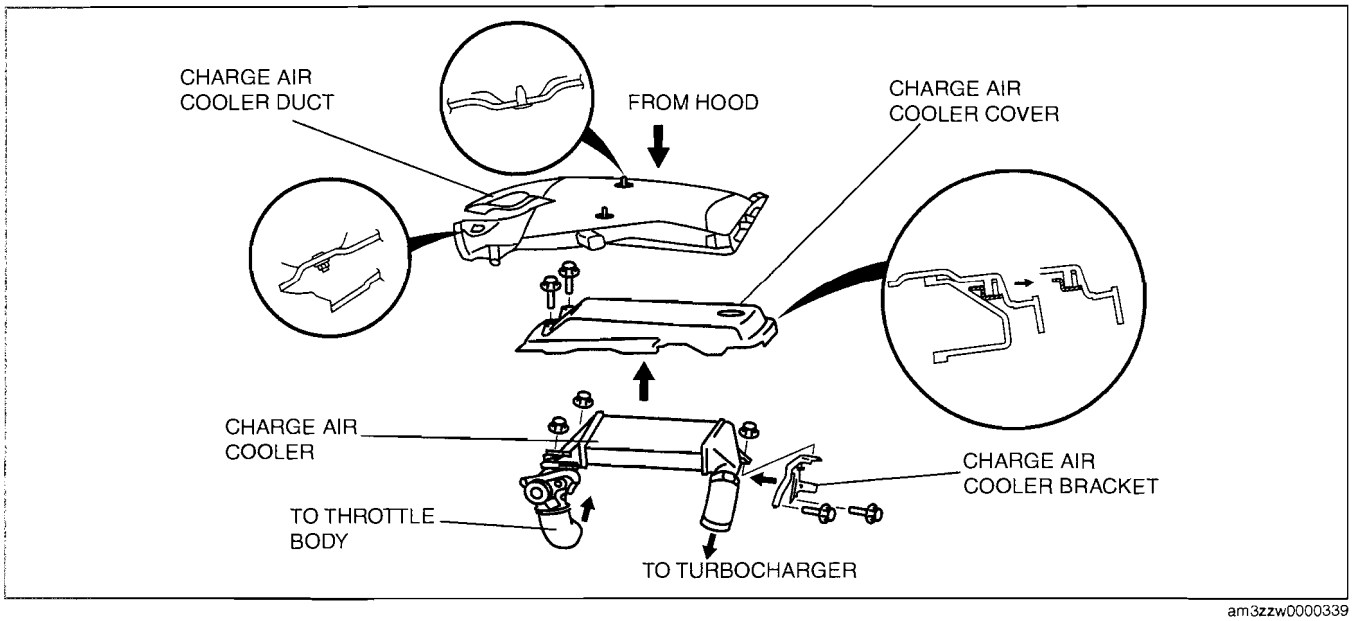
3. Remove the strap shown in the figure.



am3zzw0000331

Charge Air Cooler Removal Note

1. Remove the charge air cooler duct.



am3zzw0000339

2. Remove the charge air cooler cover.
3. Remove the charge air cooler.
4. Remove the charge air cooler bracket.

Air Hose Removal Note

1. Disconnect the variable swirl shutter valve switch connector.
2. Disconnect the fuel injector harness connector.
3. Disconnect the ventilation hose connected to the air hose.
4. Remove the air hose.

Air Duct Removal Note

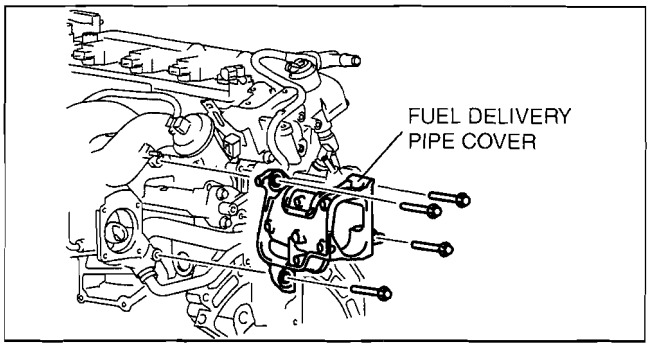
1. Disconnect the wastegate control solenoid valve connector.
2. Disconnect the purge solenoid valve connector.
3. Disconnect the EGR valve connector.
4. Remove the air duct.

Throttle Body Removal Note

1. Disconnect the throttle body connector.
2. Drain the engine coolant before removing the water hose. (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
3. Remove the throttle body.

Intake Manifold Removal Note

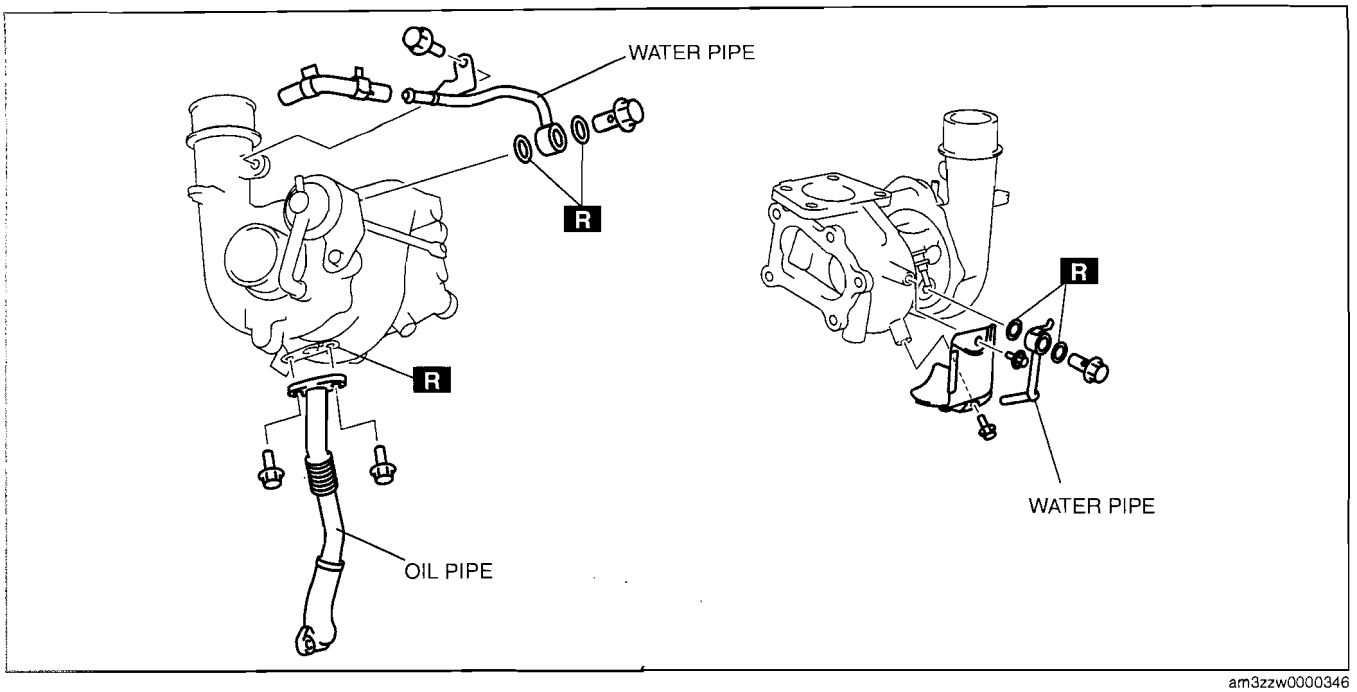
1. Remove the fuel delivery pipe cover.
2. Disconnect the quick connector connected to the intake manifold.
3. Remove the EGR pipe.
4. Disconnect the variable swirl solenoid valve connector.
5. Remove the oil level gauge pipe. (See 01-11B-5 OIL PAN REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
7. Set the power steering oil pump out of the way.
8. Disconnect the fuel pressure sensor connector.
9. Disconnect the brake vacuum hose.
10. Disconnect the MAP sensor connector.
11. Remove the intake manifold installation bolts.
12. Disconnect the evaporative hose connected between the intake manifold and the PCV valve from the intake manifold.
13. Remove the intake manifold.



acxuuw00000206

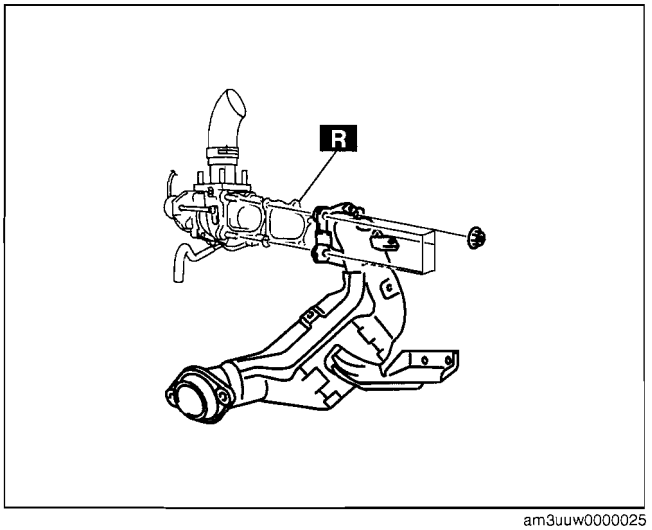
Turbocharger Removal Note

1. Remove the TWC. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the rear HO2S
3. Remove the insulator (Exhaust manifold upper side). (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Set the generator duct out of the way. (See 01-17B-6 GENERATOR REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the insulator (Exhaust manifold lower side). (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the insulator (WU-TWC top side). (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove the front HO2S. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
8. Remove the WU-TWC. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
9. Remove the oil pipe and water pipe.



am3zzw0000346

10. Remove the turbocharger.



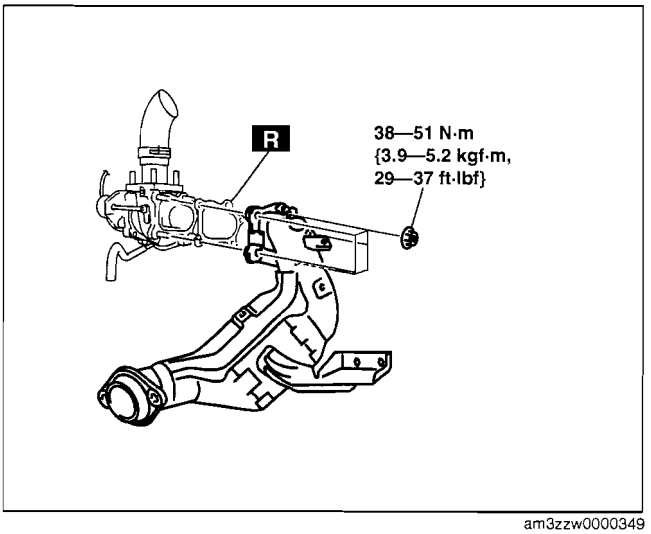
am3uuw0000025

Turbocharger Installation Note

1. Install the turbocharger.

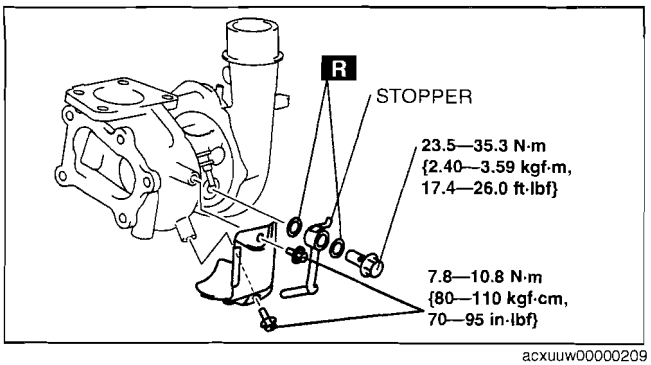
   Tightening torque
   38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

2. Install the WU-TWC. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
3. Install the front HO2S. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)



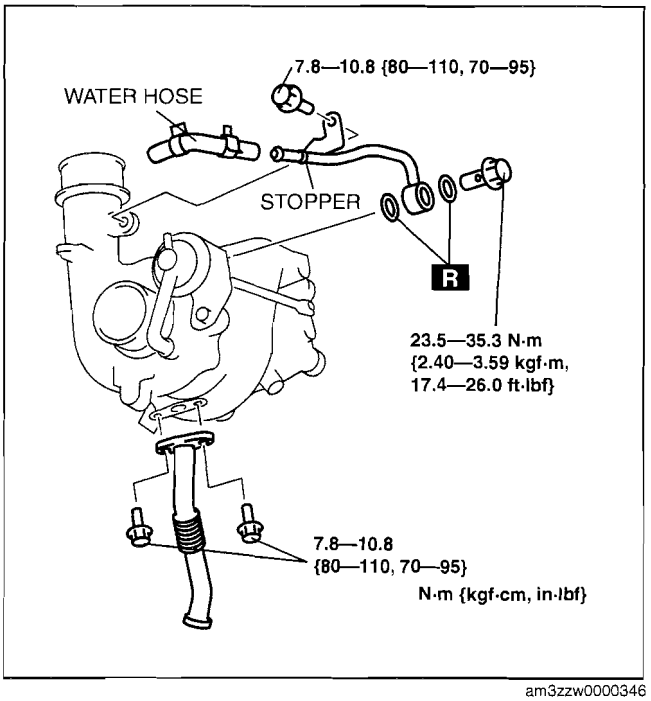
am3zzw0000349

4. Tight the water pipe installation bolt while the stopper of the water pipe is faced to the turbocharger.



acxuuw00000209

5. Install the water pipes and, insert the water hose until it reaches the stopper.

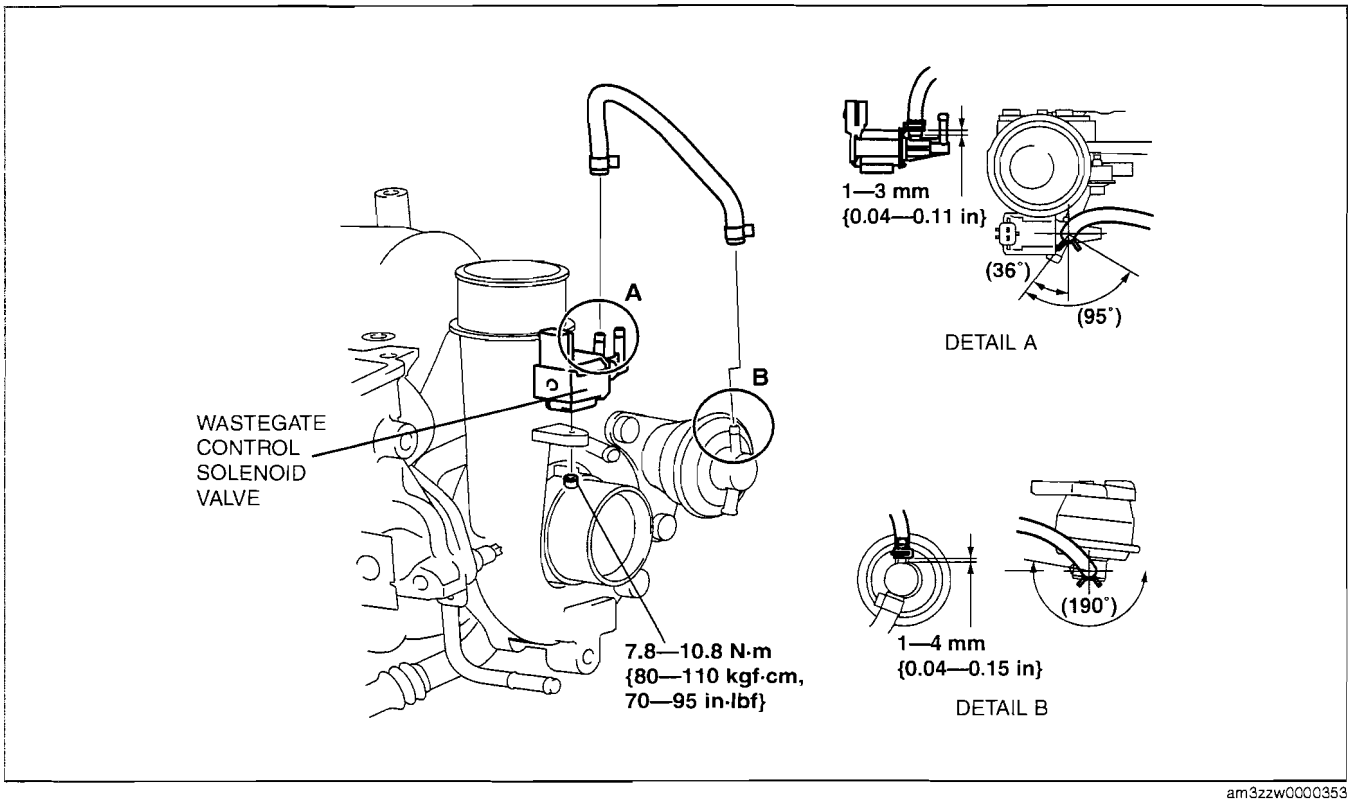


am3zzw0000346

Wastegate Control Solenoid Valve Installation Note

1. Install the wastegate control solenoid valve.

Tightening torque
7.8—10.8 N·m {80—110 kgf·cm, 70—95 in·lbf}



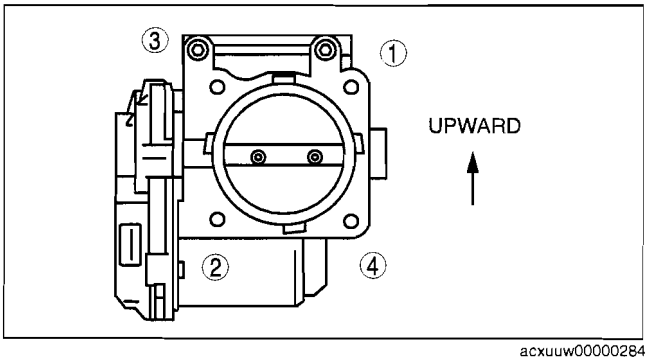
am3zzw0000353

2. Install the hose as shown in the figure.

Throttle Body Installation Note

1. Tighten the throttle body installation bolts in the order shown in the figure.

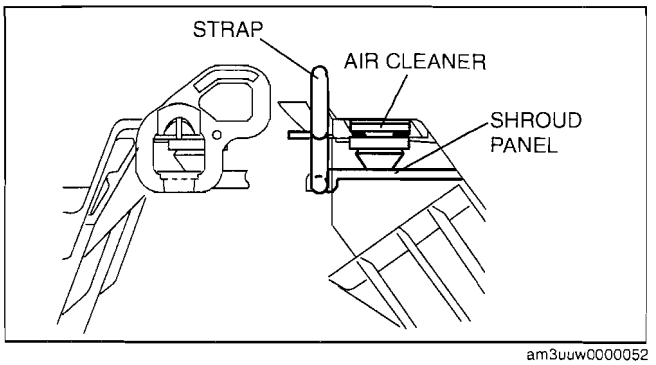
Tightening torque
8—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}



acxuuw00000284

Strap Installation Note

1. Using the strap, secure the shroud panel and the air cleaner case as shown in the figure.



am3uuw0000052

AIR CLEANER ELEMENT INSPECTION[L3 WITH TC]

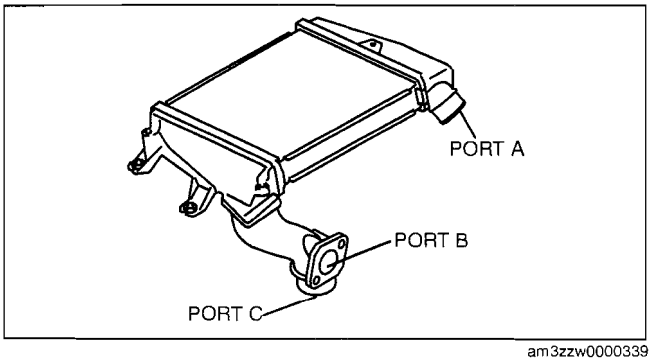
id011339800800

1. Remove the air cleaner element. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Verify that the air cleaner element surface is free of dirt.
   - If there is dirt, use an air gun or similar tool to clean the element.
   - If the replacement time limit has passed, replace the element.

CHARGE AIR COOLER INSPECTION[L3 WITH TC]

id011339800900

1. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the air bypass valve. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Plug ports A and B.
5. Verify that there is no air leakage when air is sent from port C.
   - If there is leakage, replace the charge air cooler.



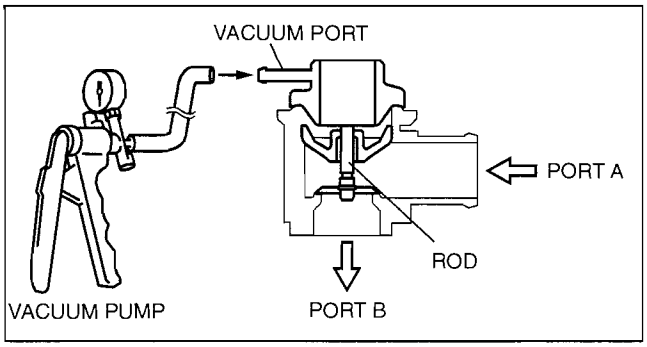
am3zzw0000339

AIR BYPASS VALVE INSPECTION[L3 WITH TC]

id011339800500

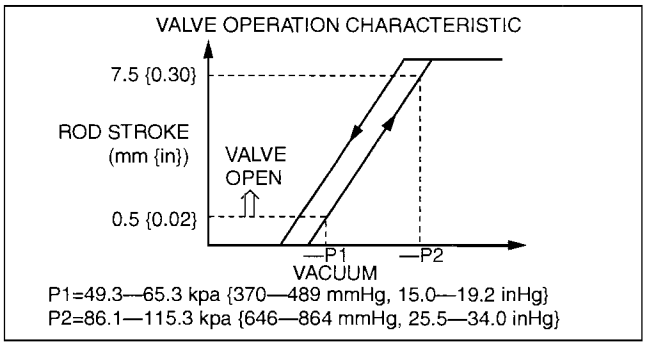
1. Remove the air bypass valve. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Connect the vacuum pump to the vacuum ports of the air bypass valve.
3. Verify that the airflow is as indicated in the table.
   - If there is any malfunction, replace the air bypass valve.

Vacuum (kPa {mmHg, inHg})	Valve operation condition	Airflow between port A—B
–66 {–496, –20} or more	Open	Yes
–49 {–367, –14} or less	Closed	No



acxuuw00000287

Approx. value



acxuuw00000286

THROTTLE ACTUATOR INSPECTION[L3 WITH TC]

id011339801300

Note
- Perform the following inspection only when directed.

Resistance Inspection

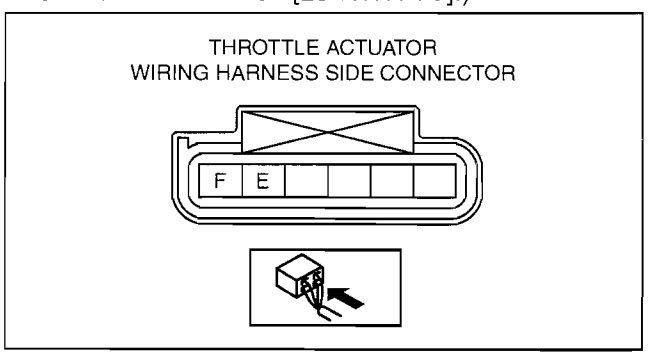
1. Remove the battery cover. (See01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Disconnect the throttle body connector.
4. Measure the resistance between the throttle actuator terminals using a tester.
   - If not as specified, replace the throttle body. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
   - If as specified, carry out the "Circuit Open/Short Inspection".

Specification

Ambient temperature (°C {°F})	Resistance (ohm)
Approx. 20 {68}	0.3—100

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit (continuity check).



acxuuw00000024

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

acxuuw00000025

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Throttle actuator terminal F and PCM terminal 2A
  - — Throttle actuator terminal E and PCM terminal 2B

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Throttle actuator terminal F and power supply
  - — Throttle actuator terminal F and ground
  - — Throttle actuator terminal E and power supply
  - — Throttle actuator terminal E and ground

VARIABLE SWIRL SHUTTER VALVE ACTUATOR INSPECTION[L3 WITH TC]

id011339801200

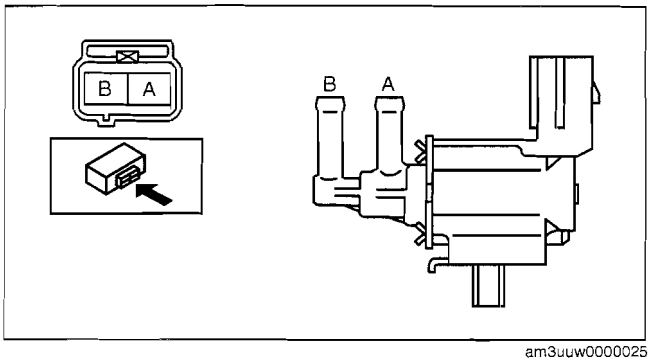
1. Remove the air hose. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the vacuum hose from the variable swirl control solenoid valve.
3. Connect a vacuum pump to the variable swirl shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
   - If the rod does not move, replace the intake manifold. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)

Vacuum kPa {mmHg, inHg}	Rod movement
–2.7 {–20, –0.7} or less	Not move
–33.4 {–251, –9.9} or more	Fully pulled

VARIABLE SWIRL SOLENOID VALVE INSPECTION[L3 WITH TC]

id011339801100

1. Remove the variable swirl solenoid valve.
2. Inspect the airflow between the ports under the following conditions.
   - If not as specified, replace the variable swirl control solenoid valve.
   - If as specified, carry out the "Circuit Open/ Short Inspection".



am3uuw0000025

○—○ : Continuity ○═○ : Airflow

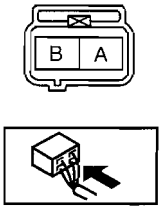
Step	Terminal		Port	
	A	B	A	B
1	○—○			
2	B+	GND	○═○	

acxuuw00000027

Circuit Open/Short Inspection

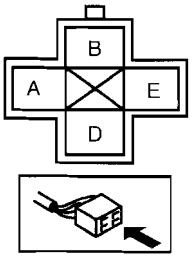
1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harness for open or short circuit (continuity check).

VARIABLE SWIRL SOLENOID VALVE
WIRING HARNESS SIDE CONNECTOR



acxuuw00000028

MAIN RELAY

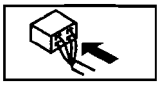


am3zzw0000361

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



acxuuw00000029

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Variable swirl solenoid valve terminal B and PCM terminal 2AS
  - Variable swirl solenoid valve terminal A and main relay terminal A

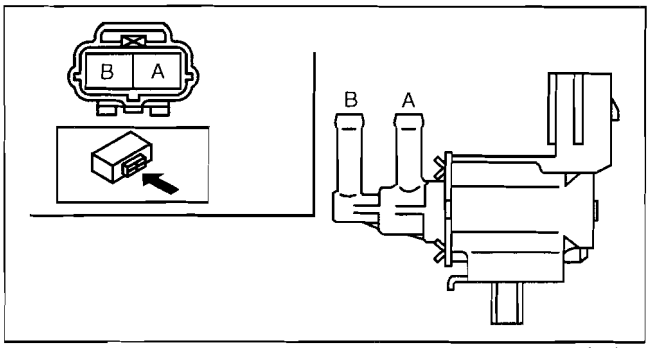
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Variable swirl solenoid valve terminal A and body ground
  - Variable swirl solenoid valve terminal B and power supply
  - Variable swirl solenoid valve terminal B and body ground

WASTEGATE CONTROL SOLENOID VALVE INSPECTION[L3 WITH TC]

id011339800600

1. Remove the wastegate control solenoid valve. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the airflow between the ports under the following conditions.
   - If not as specified, replace the wastegate control solenoid valve.
   - If as specified, carry out the "Circuit Open/Short Inspection".



am3uuw0000025

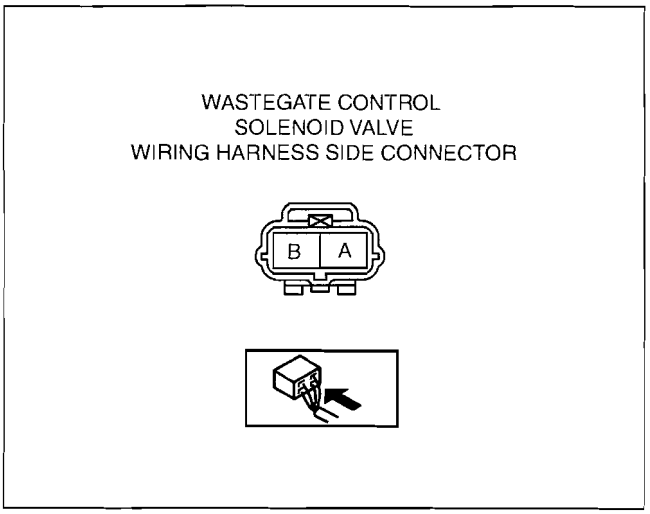
○—○ : Continuity ○═○ : Airflow

Step	Terminal		Port	
	A	B	A	B
1	○—○			
2	B+	GND	○═○	

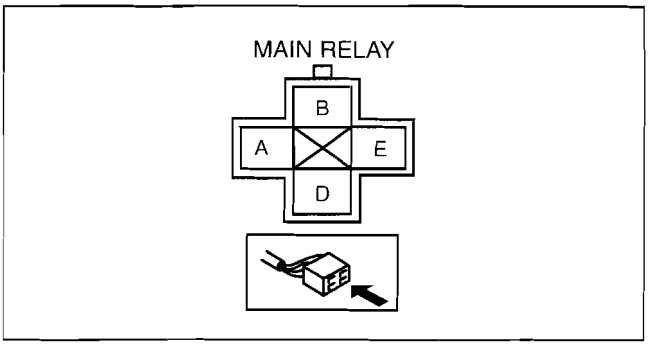
am3zzw0000354

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harness for an open or short circuit (continuity check).



acxuuw00000032

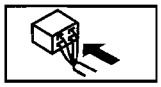


am3zzw0000361

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



acxuuw00000033

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Wastegate control solenoid valve terminal B and PCM terminal 2AA
  - Wastegate control solenoid valve terminal A and main relay terminal A

Short circuit

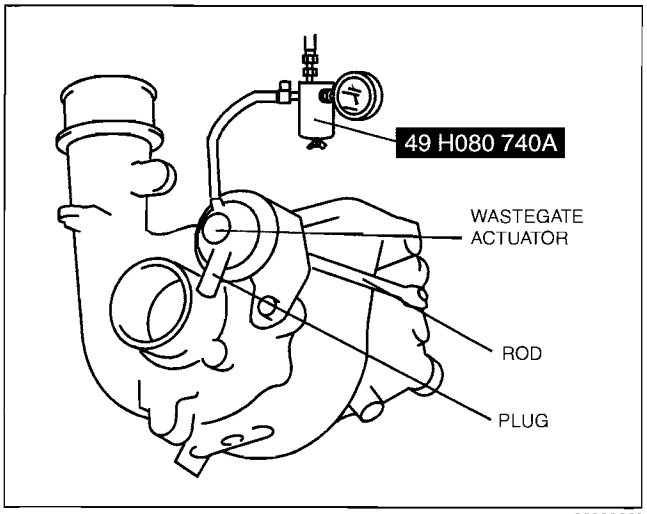
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Wastegate control solenoid valve terminal A and body ground
  - Wastegate control solenoid valve terminal B and power supply
  - Wastegate control solenoid valve terminal B and body ground

WASTEGATE ACTUATOR INSPECTION[L3 WITH TC]

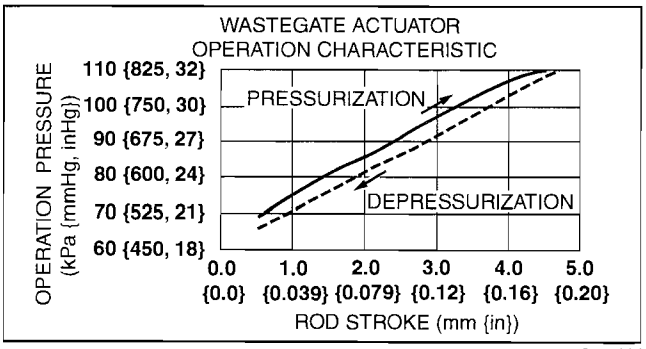
id011339800700

1. Remove the air hose and air duct. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
2. Disconnect the hose from the wastegate actuator.
3. Plug the wastegate actuator as shown in the figure.
4. Connect the vacuum pump to the port
5. Raise the pressure slowly and take a measurement of the pressure when the rod stroke is **1.5 mm {0.06 in}**.
   - If the rod does not move, replace the turbocharger.

Specification (rod stroke: 1.5 mm {0.06 in})
78.0—83.4 kPa {586—625 mmHg, 23.1—24.6 inHg}



acxuuw00000663



acxuuw00000664

TURBOCHARGER INSPECTION[L3 WITH TC]

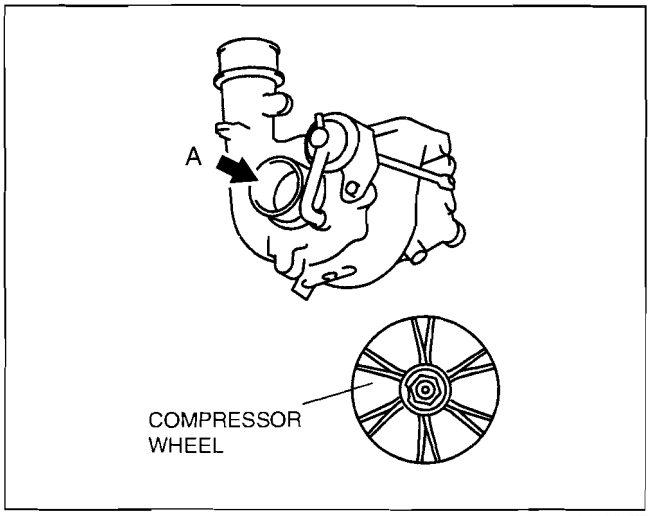
id011339801000

Compressor Wheel Inspection

1. Remove the turbocharger. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Visually inspect the compressor wheel from view A for the cracks, damage, or bending on all the compressor wheel blades.
   - If there are any cracks or damage, replace the turbocharger.

Note

- If there is contact between the compressor wheel and compressor housing, there may be cracks, damage, or bending on the blade end area.
- If there are cracks, damage, or bending on the compressor wheel, verify the following after replacing the turbocharger.
  - — Intake air/exhaust system related components
  - — Oil pipe damage



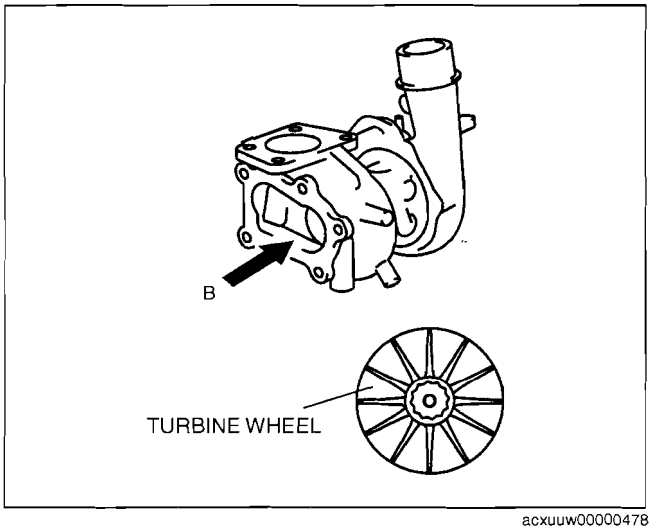
acxuuw00000477

Turbine wheel inspection

1. Remove the turbocharger. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Visually inspect the turbine wheel from view B for the cracks, damage, or bending on all the turbine wheel blades.
   - If there are cracks, damage, or bending on the turbine wheel, replace the turbocharger.

Note

- If there is contact between the turbine wheel and turbine housing, there may be cracks, damage, or bending on the blade end area.
- If there are cracks, damage, or bending on the turbine wheel, verify the following after replacing the turbocharger.
  - — Intake air/exhaust system related components
  - — Oil pipe damage



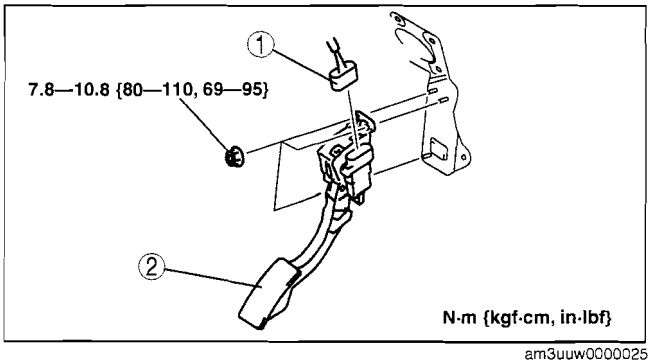
acxuuw00000478

ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC]

id011339801400

1. Remove the battery cover. (See01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

1	Connector
2	Accelerator pedal



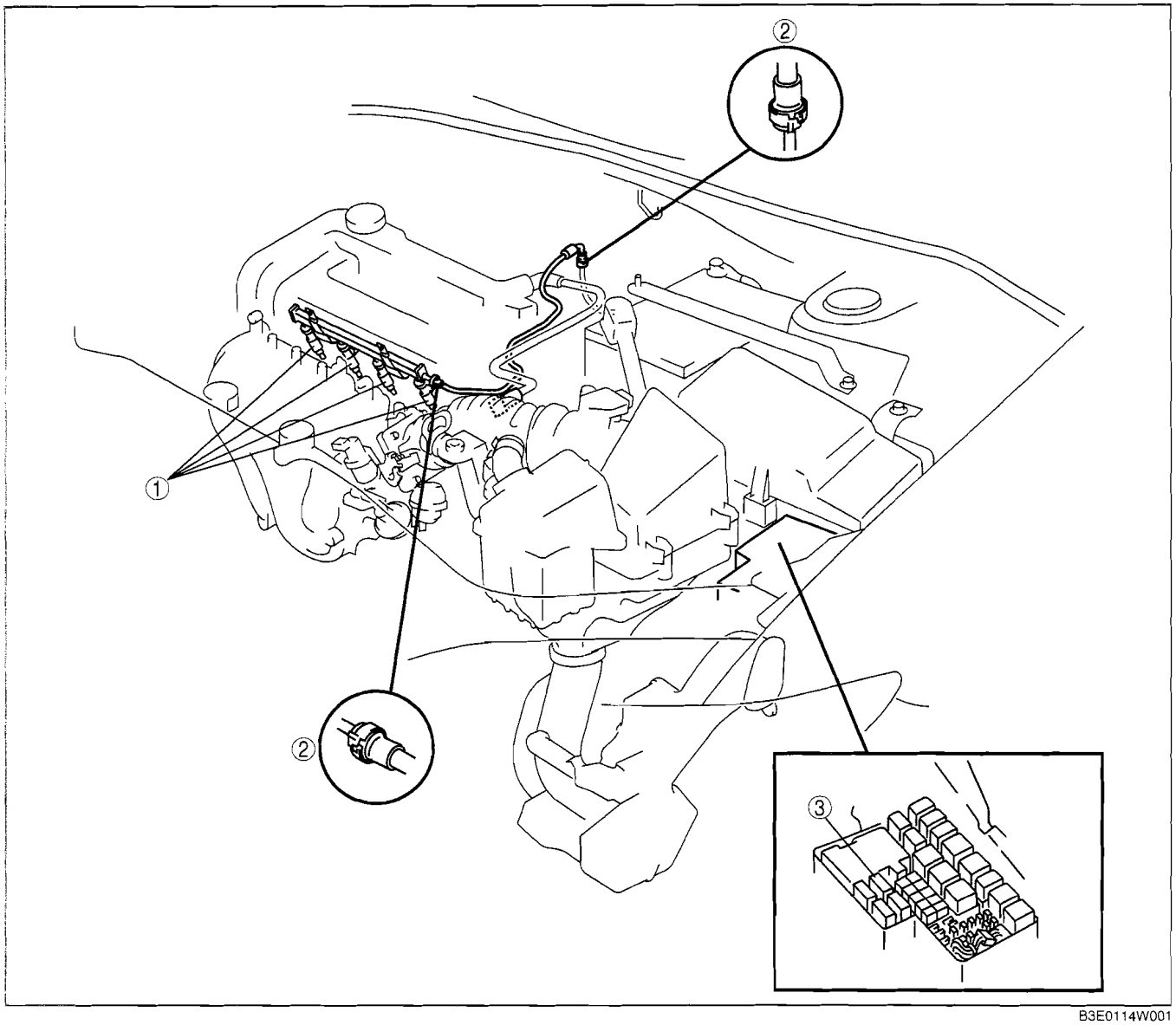
am3uuw0000025

01-14A FUEL SYSTEM [LF, L3]

FUEL SYSTEM LOCATION INDEX[LF, L3]

id0114a4800100

Engine Compartment Side

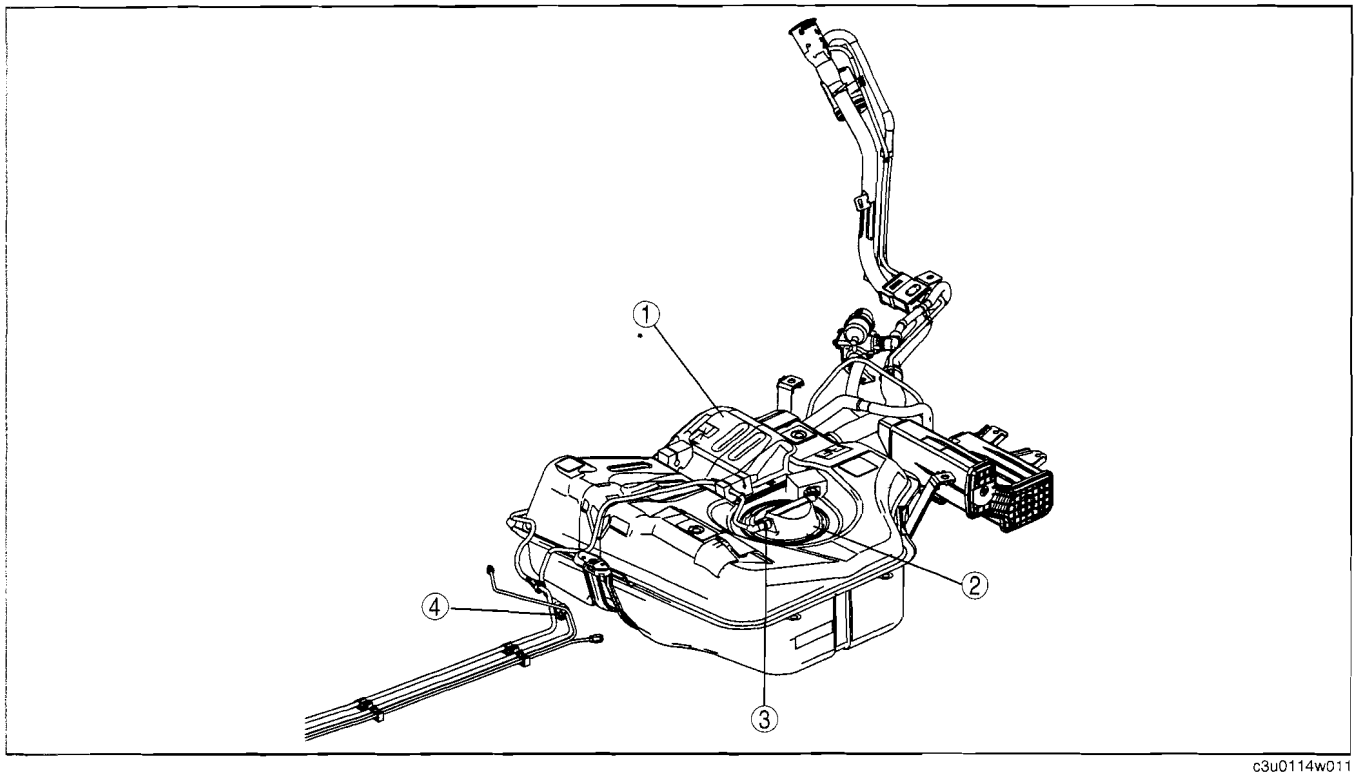


B3E0114W001

1	Fuel injector (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].) (See 01-14A-27 FUEL INJECTOR INSPECTION[LF, L3].)

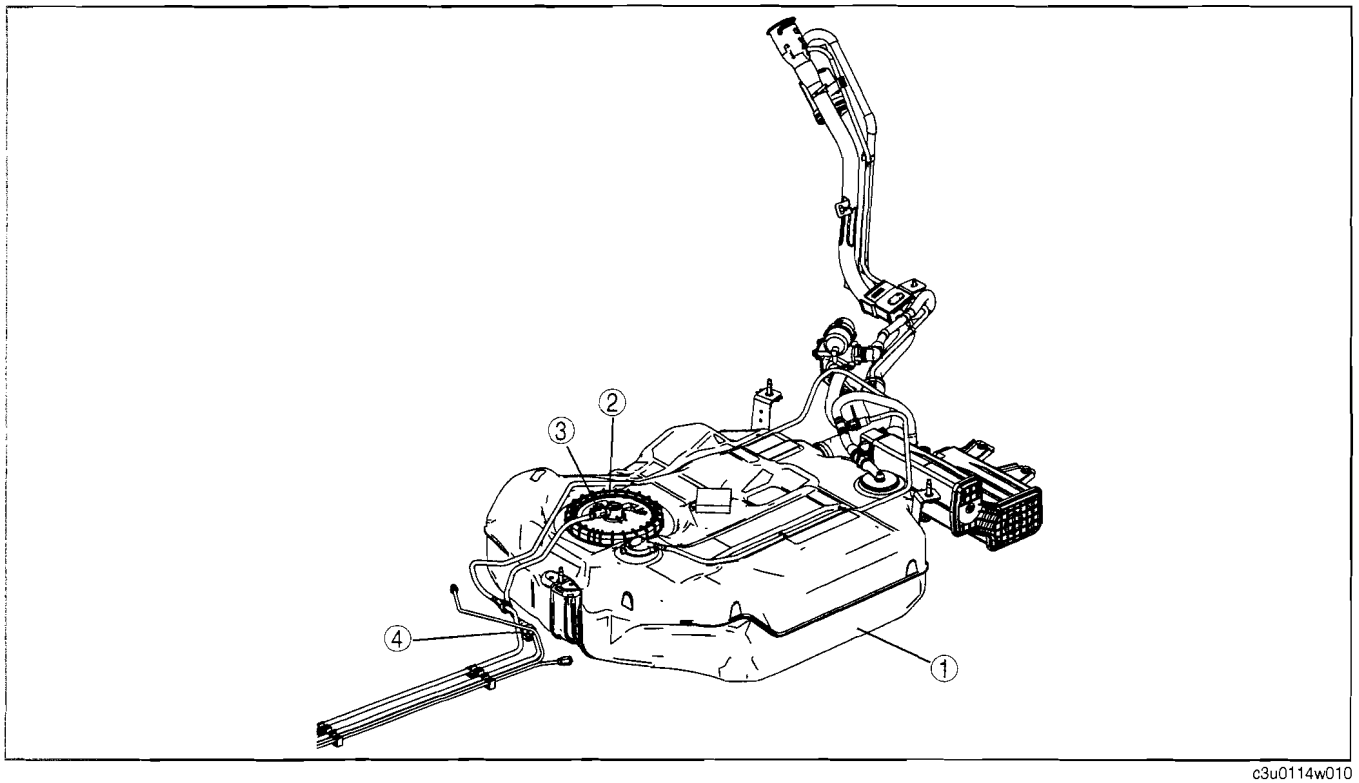
2	Quick release connector (Type A) (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
3	Fuel pump relay

Fuel Tank Side
California emission regulation applicable model



c3u0114w011

Except for California emission regulation applicable model



c3u0114w010

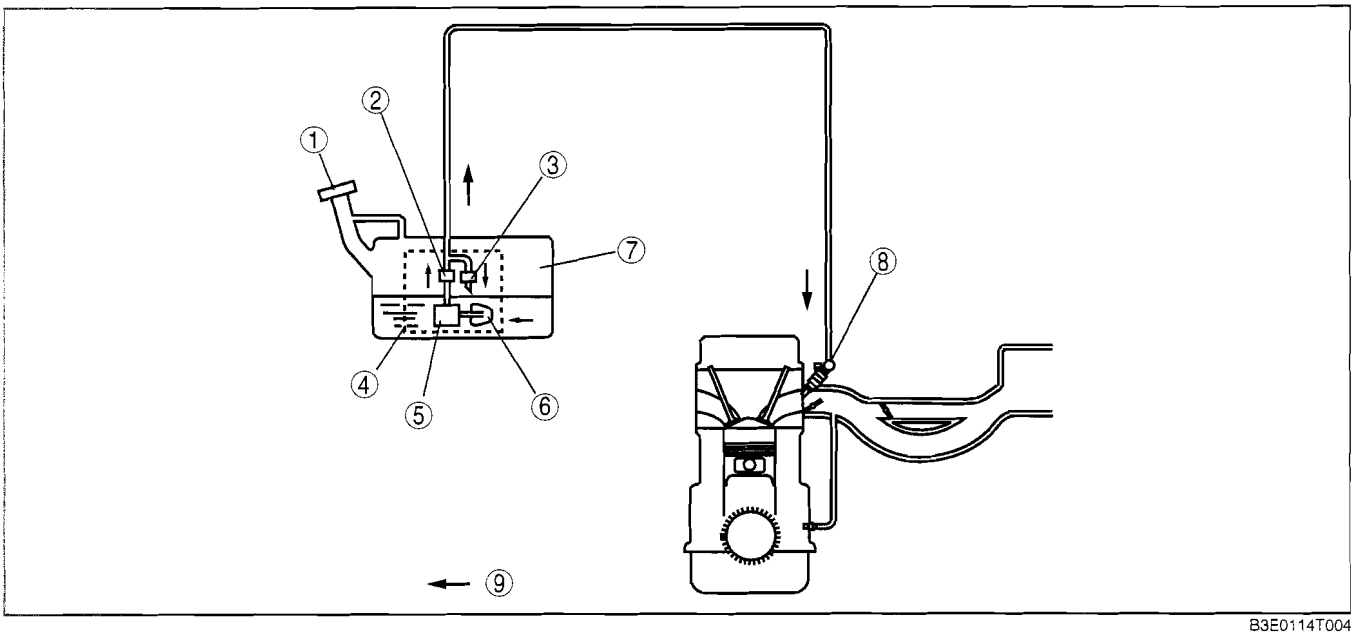
1	Fuel tank (See 01-14A-8 FUEL TANK REMOVAL/ INSTALLATION[LF, L3].) (See 01-14A-12 FUEL TANK INSPECTION[LF, L3].)

2	Fuel pump unit (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].) (See 01-14A-20 FUEL PUMP UNIT DISASSEMBLY/ ASSEMBLY[LF, L3].) (See 01-14A-20 FUEL PUMP UNIT INSPECTION[LF, L3].)

3	Quick release connector (Type B) (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
4	Quick release connector (Type C) (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)

FUEL SYSTEM FLOW DIAGRAM[LF, L3]

id0114a4100300



B3E0114T004

1	Fuel-filler cap
2	Fuel filter (high pressure)
3	Pressure regulator
4	Fuel pump unit
5	Fuel pump
6	Fuel filter (low pressure)
7	Fuel tank
8	Fuel injector
9	Fuel flow

BEFORE SERVICE PRECAUTION[LF, L3]

id0114a4802000

Warning

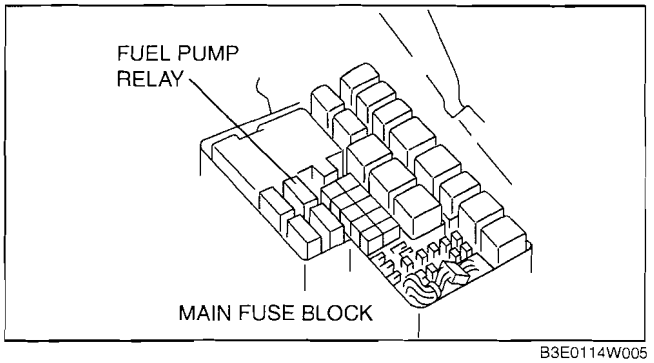
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure".**
- **A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before performing work on the fuel system, discharge static electricity by touching the vehicle body.**

Caution

- **If there is foreign material on the connecting area of the quick release connector, it might damage the connector or fuel pipe. To prevent this, disconnect the connector and clean the connecting area before connecting.**

Fuel Line Safety Procedure

1. Remove the fuel-filler cap to release the pressure inside the fuel tank.
2. Remove the fuel pump relay.
3. Start the engine.
4. After the engine stalls, crank the engine **several times**.
5. Turn the ignition switch to the LOCK position.
6. Install the fuel pump relay.



B3E0114W005

AFTER SERVICE PRECAUTION[LF, L3]

id0114a4801900

Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Leakage Inspection".**

Fuel Leakage Inspection

Warning

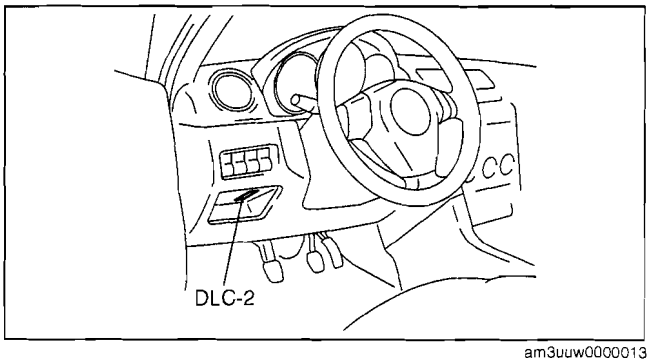
- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, complete the following inspection with the engine stopped.**

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.
3. Verify that there is no fuel leakage from the pressurized parts.
   - If there is leakage, replace the fuel hoses and clips.
   - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard
There shall be no leakage after 5 min.

4. After reinstallation, repeat step 2—3 in the fuel leakage inspection.



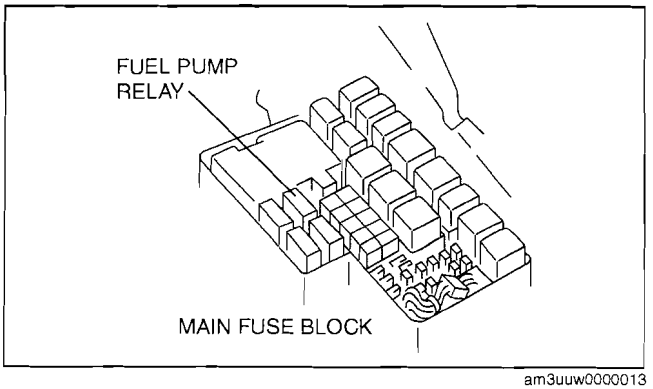
am3uuw0000013

Without using M-MDS

1. Disconnect the negative battery cable.
2. Remove the fuel pump relay.

Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**

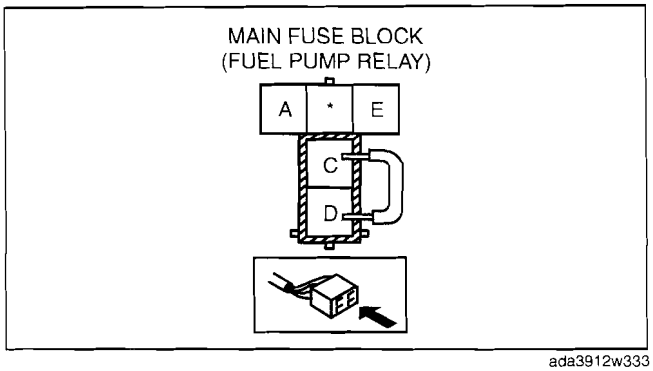


am3uuw0000013

3. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.
4. Verify that there is no fuel leakage from the pressurized parts.
   - If there is leakage, replace the fuel hoses and clips.
   - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard
There shall be no leakage after 5 min.

5. After reinstallation, repeat step 3—4 in the fuel leakage inspection.



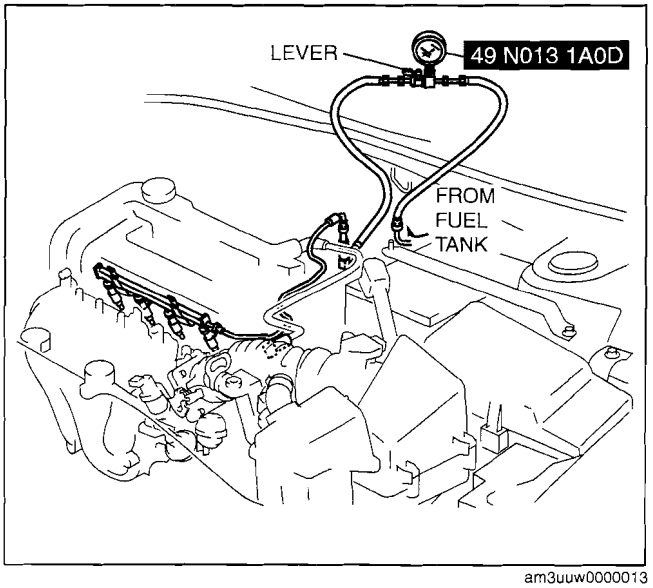
ada3912w333

FUEL LINE PRESSURE INSPECTION[LF, L3]

id0114a4800500

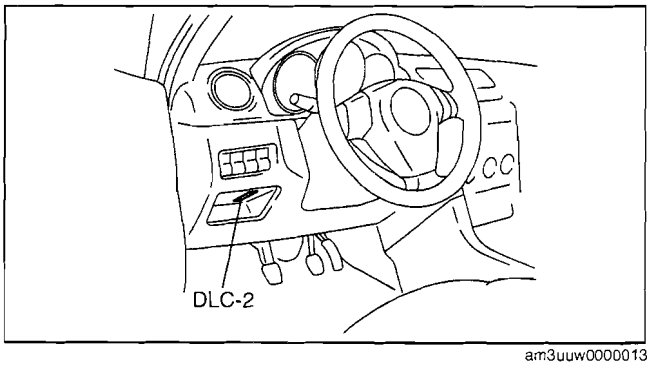
Warning
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.**

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Disconnect the quick release connector (in the engine compartment). (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
4. Turn the lever of the **SST** parallel to the hose as shown in the figure.
5. Insert the **SST** quick release connector into the fuel pipe until a click is heard.
6. Verify that the quick release connector is firmly connected by pulling it by hand.
7. Start the fuel pump using the following procedure:



am3uuw0000013

Using M-MDS
1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.



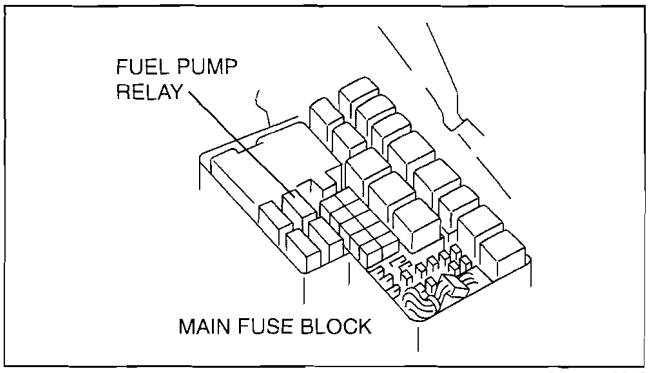
am3uuw0000013

Without using M-MDS

1. Remove the fuel pump relay.

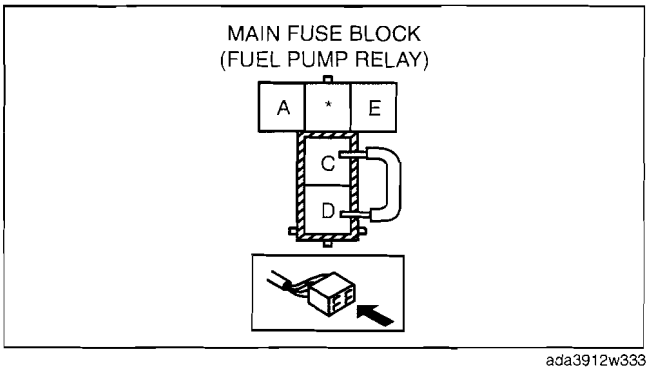
Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000013

2. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.



ada3912w333

8. Operate the fuel pump for **10 s**.
9. Measure the fuel line pressure.
   - If not within the specification, inspect the following:
     If it less than the specification:
     — Fuel pump unit
     — Fuel line leakage
     If it exceeds the specification:
     — Pressure regulator

Fuel pressure (Reference)

350—410 kPa {3.57—4.18 kgf/cm^2, 50.8—59.4 psi}

10. Stop the fuel pump using the following procedure:
    Using M-MDS
    1. Stop the fuel pump using the "FP" simulation function.
    Without using M-MDS
    1. Disconnect the negative battery cable to stop the fuel pump.
11. Measure the fuel hold pressure **after 5 min**.
    - If not within the specification, inspect the following:
      — Fuel line for clogging or leakage

Fuel hold pressure (Reference)

250 kPa {2.55 kgf/cm^2, 36.2 psi} or more

12. Disconnect the **SST**.
13. Connect the quick release connector. (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
14. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

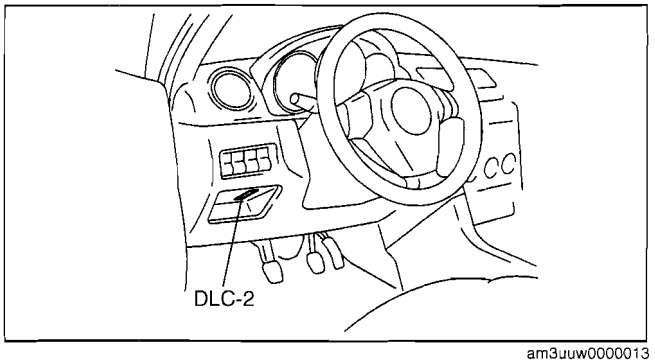
FUEL TANK REMOVAL/INSTALLATION[LF, L3]

id0114a4801600

Warning

- **Repairing a fuel tank containing fuel is dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.**
- **A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.**

1. Park the vehicle on a level surface.
2. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
3. Drain the fuel from the fuel tank using the following procedure:
   (1) Disconnect the quick release connector (in the engine compartment). (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
   (2) Attach a long hose to the disconnected fuel pipe and drain the fuel into a proper receptacle.
   (3) Start the fuel pump using the following procedure:
   Using M-MDS
   1. Connect the M-MDS to the DLC-2.
   2. Start the fuel pump using the "FP" simulation function.

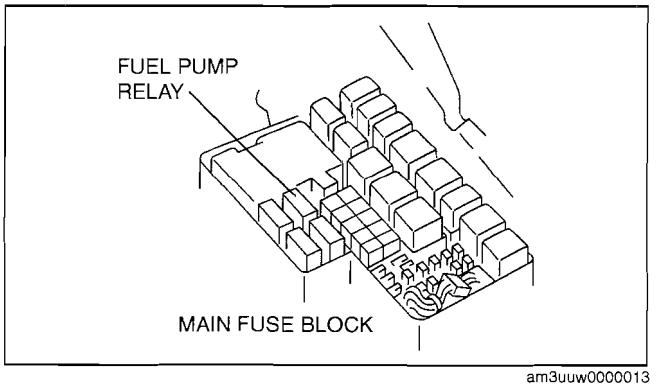


am3uuw0000013

   Without using M-MDS
   1. Disconnect the negative battery cable.
   2. Remove the fuel pump relay.

Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**

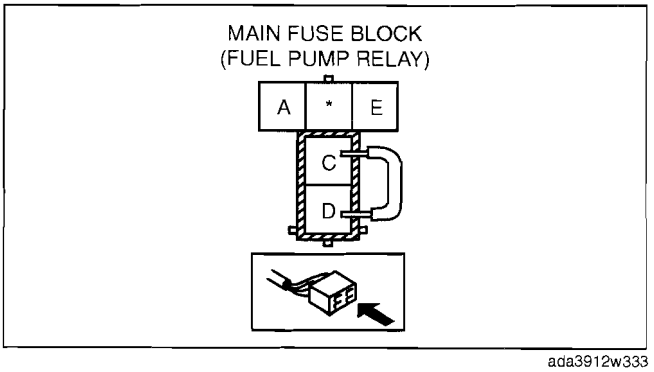


am3uuw0000013

   3. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.

Caution

- **The fuel pump may malfunction if it is operated without any fuel in the fuel tank (fuel pump idling). Constantly monitor the amount of fuel being discharged and immediately stop operation of the pump when essentially no fuel is being discharged.**

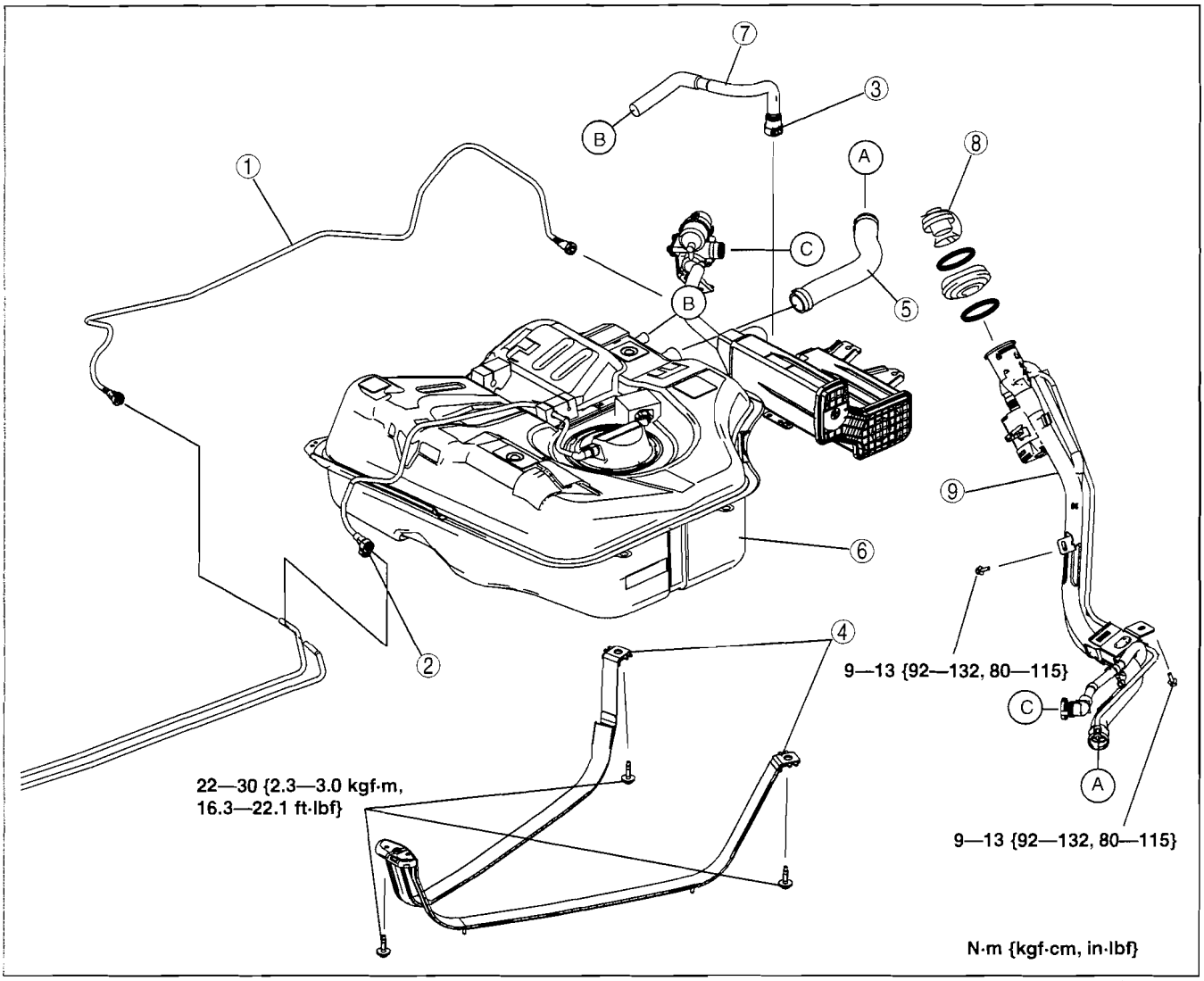


ada3912w333

   (4) When essentially no fuel is being discharged from the hose, stop the fuel pump using the following procedure:
   Using M-MDS
   1. Stop the fuel pump using the "FP" simulation function.
   Without using M-MDS
   1. Disconnect the negative battery cable to stop the fuel pump.

4. Disconnect the negative battery cable. (using M-MDS)
5. Remove the rear seat cushion. (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
6. Remove the service hole cover.
7. Disconnect the fuel pump unit connector.
8. Remove the charcoal canister protector. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].)
9. Lower the main silencer so that the insulator can be removed. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
10. Remove the insulator.
11. Remove the rear under cover (LH).
12. Remove in the order indicated in the table.
13. Install in the reverse order of removal.
14. Inspect all parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

California emission regulation applicable model

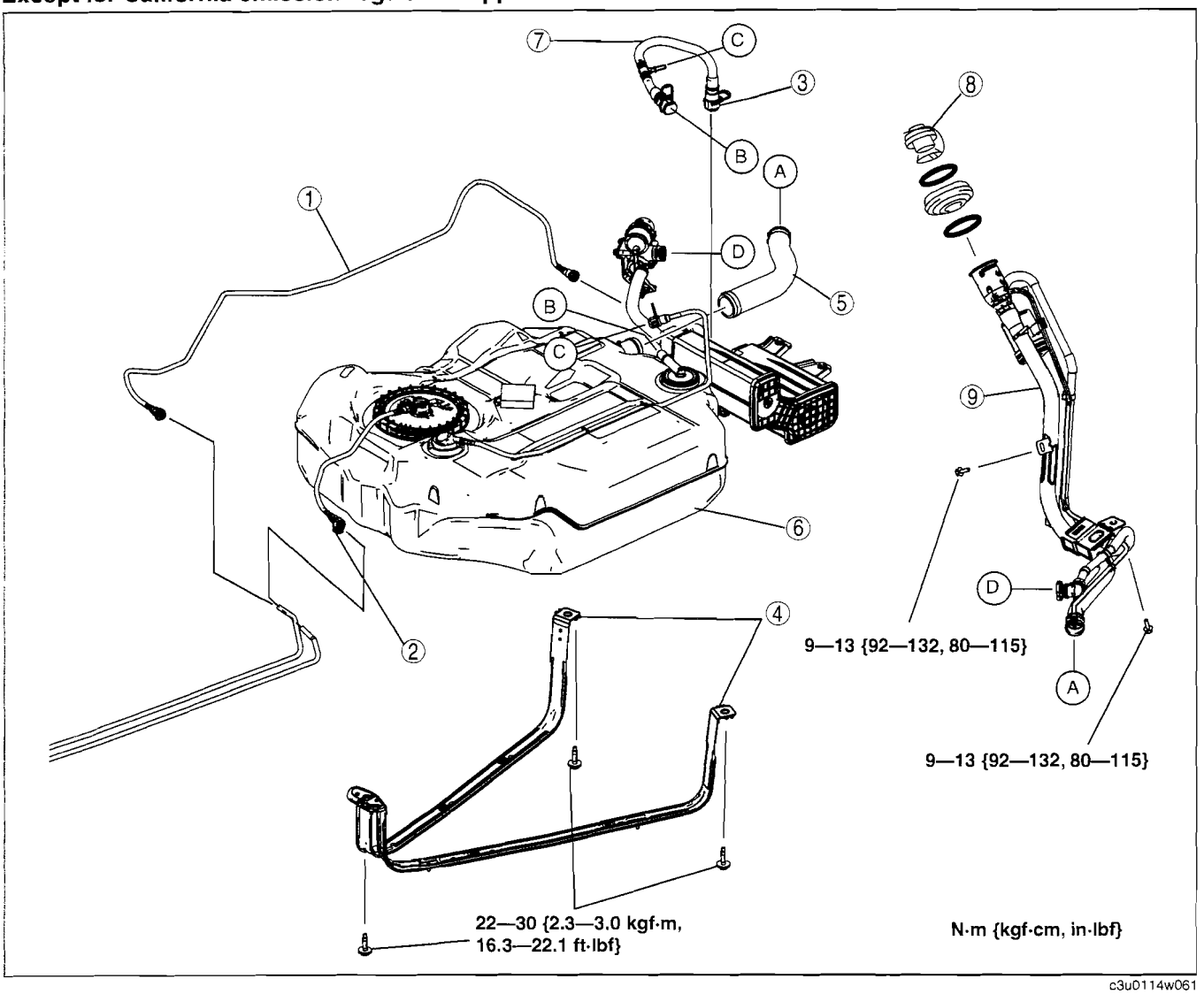


c3u0114w062

1	Evaporative hose (See 01-14A-11 Evaporative Hose Removal/Installation Note.)
2	Quick release connector (on fuel line) (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
3	Quick release connector (on charcoal canister) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)

4	Strap
5	Joint hose (See 01-14A-11 Joint Hose Removal Note.) (See 01-14A-11 Joint Hose Installation Note.)
6	Fuel tank
7	Breather hose (See 01-14A-11 Breather Hose Removal Note.) (See 01-14A-11 Breather Hose Installation Note.)
8	Fuel-filler cap
9	Fuel-filler pipe (See 01-14A-11 Fuel-filler Pipe Removal Note.)

Except for California emission regulation applicable model



c3u0114w061

1	Evaporative hose (See 01-14A-11 Evaporative Hose Removal/ Installation Note.)
2	Quick release connector (on fuel line) (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
3	Quick release connector (on charcoal canister) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)

4	Strap
5	Joint hose (See 01-14A-11 Joint Hose Removal Note.) (See 01-14A-11 Joint Hose Installation Note.)
6	Fuel tank
7	Breather hose (See 01-14A-11 Breather Hose Removal Note.) (See 01-14A-11 Breather Hose Installation Note.)
8	Fuel-filler cap
9	Fuel-filler pipe (See 01-14A-11 Fuel-filler Pipe Removal Note.)

Evaporative Hose Removal/Installation Note

- Refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION" to disconnect the quick release connector of the front side of the fuel tank. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
- Refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION" to disconnect the quick release connector connected to the charcoal canister. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
- Refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION" to reconnect the quick release connector of the front side of the fuel tank. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
- Refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION" to reconnect the quick release connector connected to the charcoal canister. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)

Joint Hose Removal Note

1. Remove the fuel-filler pipe installation bolt.
2. Loosen the tie band connecting with the fuel tank.
3. Pull down the fuel-filler pipe to disconnect the joint hose.

Breather Hose Removal Note

- Except for California emission regulation applicable model, refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION)" to disconnect the quick release connector connecting to the fuel shut-off valve. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)

Fuel-filler Pipe Removal Note

1. Remove the rear tire (RH).
2. Remove the rear mudguard (RH).
3. Support the rear crossmember using a transmission jack.
4. Remove the rear shock absorber (RH) lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
5. Loosen the rear crossmember installation nuts (6 locations) and lower the rear crossmember **30 mm {1.2 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
6. Remove the fuel-filler pipe.

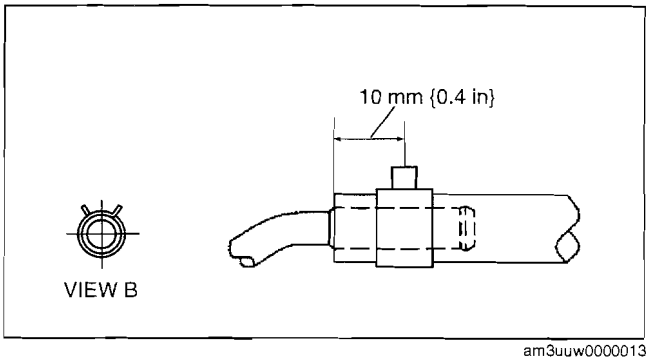
Breather Hose Installation Note

California emission regulation applicable model

- Connect the breather hose connecting with the fuel tank and clamp as shown in the figure.

Except for California emission regulation applicable model

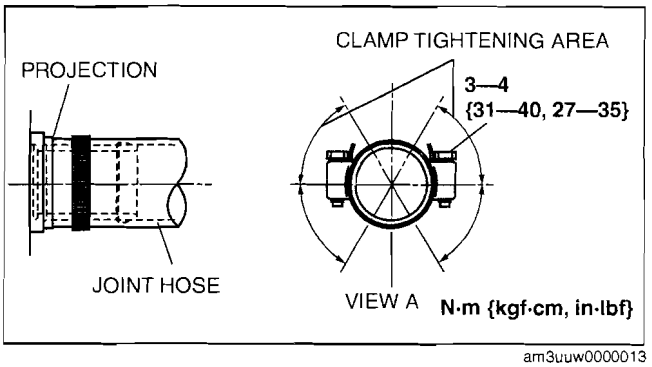
- Refer to the "QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION)" to reconnect the quick release connector connecting to the fuel shut-off valve. (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)



am3uuw0000013

Joint Hose Installation Note

1. Install the joint hose and clamp as shown in the figure.



am3uuw0000013

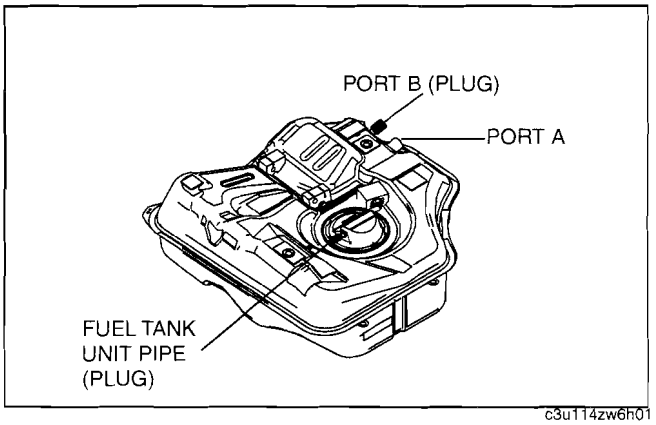
FUEL TANK INSPECTION[LF, L3]

id0114a4803200

Note
- The two rollover valves built into the fuel tank and check valves (two-way) built into the rollover valves are inspected in this inspection.

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the fuel tank. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
4. Level the fuel tank.
5. Perform the following procedure to verify the fuel tank airtightness.
   (1) Plug the fuel pump unit pipe, ports B and C.

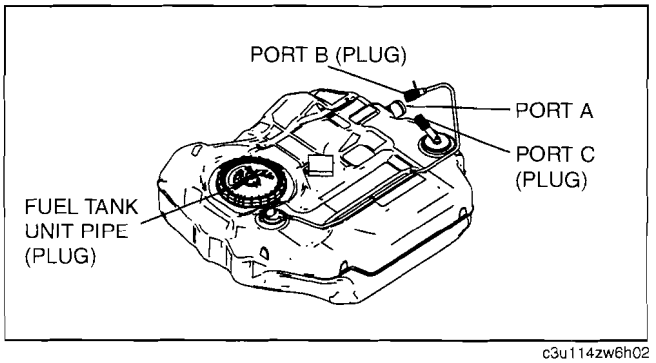
California emission regulation applicable model



c3u114zw6h01

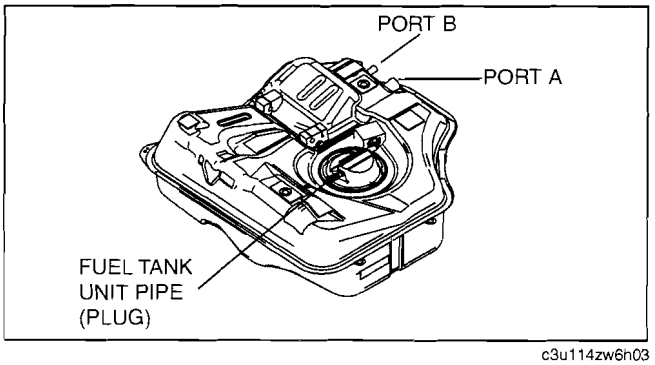
Except for California emission regulation applicable model

   (2) Apply a pressure to port A and wait for a while.
   (3) Verify that there is no air leakage from the fuel tank.
      - If there is no airflow, replace the fuel tank.
6. Apply a pressure to port A and wait for a while.



c3u114zw6h02

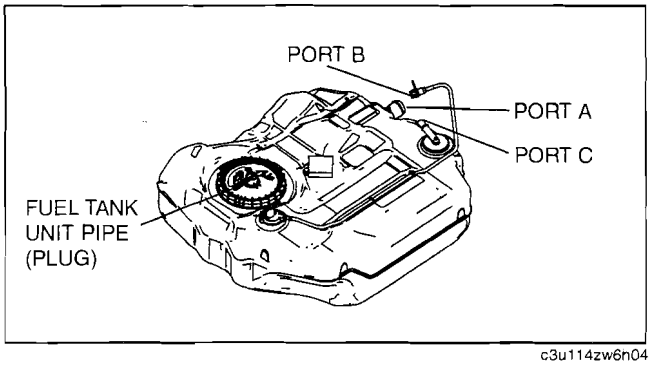
California emission regulation applicable model



c3u114zw6h03

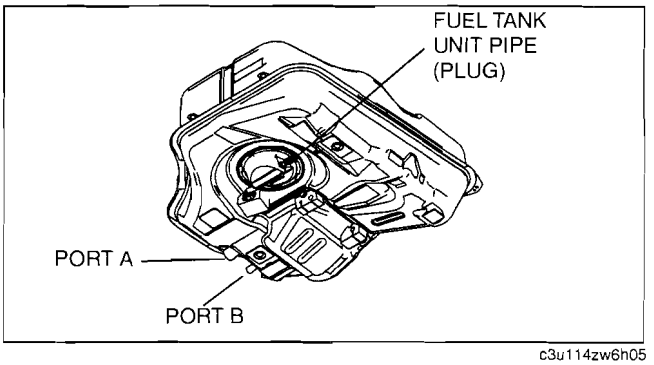
Except for California emission regulation applicable model

7. With the pressure still applied, verify that there is airflow from port B and C.
   - If there is no airflow from either port, replace the fuel tank.
8. Place the fuel tank upside down.
9. Apply a pressure to port A and wait for a while.



c3u114zw6h04

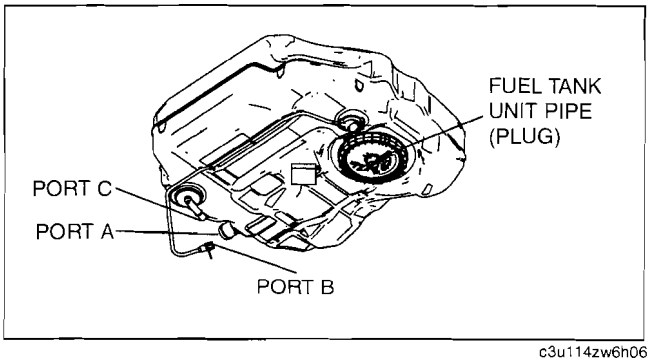
California emission regulation applicable model



c3u114zw6h05

Except for California emission regulation applicable model

10. With the pressure still applied, verify that there is no airflow from port B and C.
    - If there is airflow from either port, replace the fuel tank.

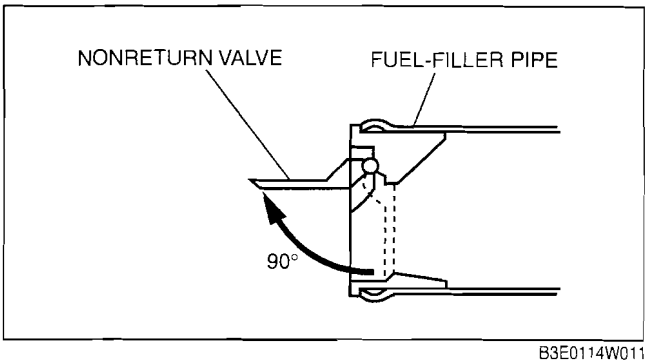


c3u114zw6h06

NONRETURN VALVE INSPECTION[LF, L3]

id0114a4803600

1. Remove the fuel-filler pipe. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
2. Move the valve and verify that the valve opens to **90°**.
   - If it does not open, replace the fuel-filler pipe.
3. Verify that the nonreturn valve returns to the normal position by spring force.
   - If it does not return, replace the fuel-filler pipe.



B3E0114W011

FUEL PUMP UNIT REMOVAL/INSTALLATION[LF, L3]

id0114a4800900

Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to "BEFORE SERVICE PRECAUTION".**
- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".**

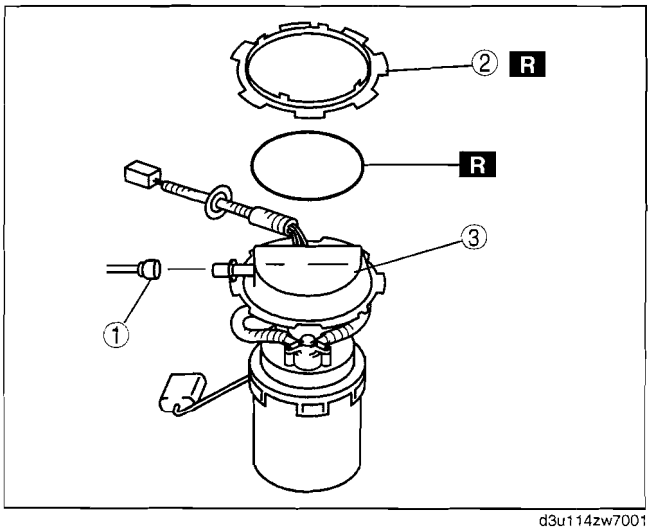
Note

- Gasket must be replaced anytime fuel pump is removed or replaced.

California Emission Regulation Applicable Model

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the fuel tank. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

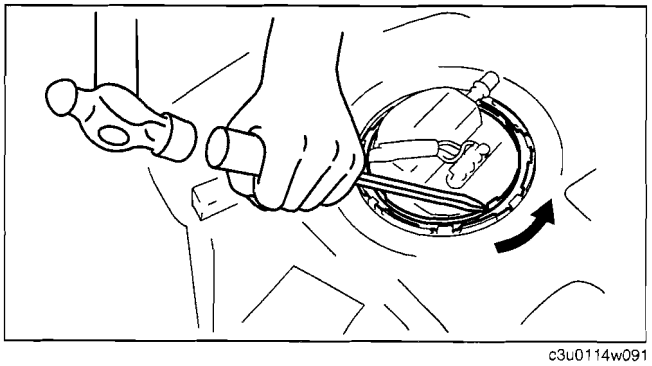
1	Quick release connector (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3], 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3],.)
2	Retainer ring (See 01-14A-14 Retainer ring removal note.) (See 01-14A-15 Retainer ring installation note.)
3	Fuel pump unit (See 01-14A-15 Fuel pump unit removal note.) (See 01-14A-15 Fuel pump unit installation note.)



d3u114zw7001

Retainer ring removal note

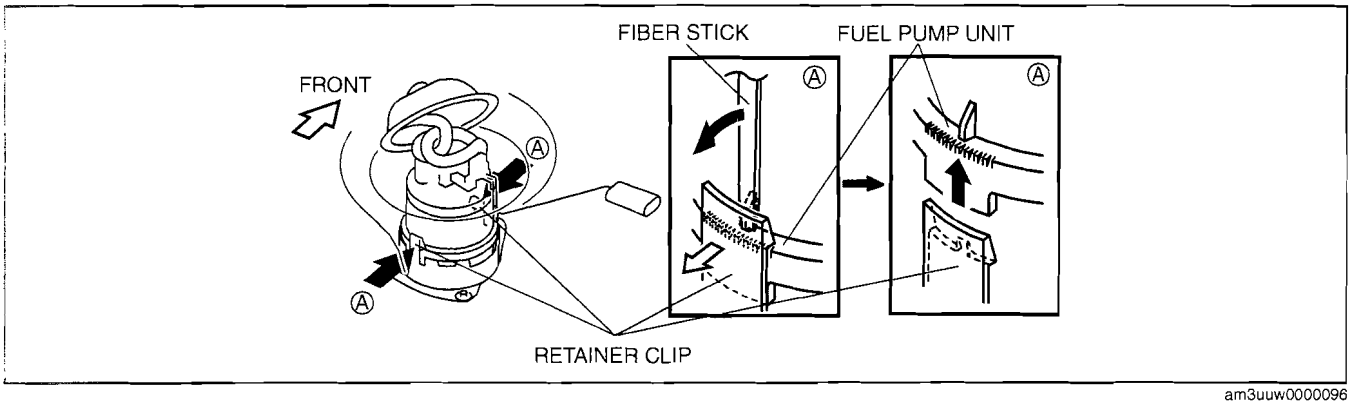
1. Remove the retainer ring by tapping a retainer ring projection using a flathead screwdriver as shown in the figure.



c3u0114w091

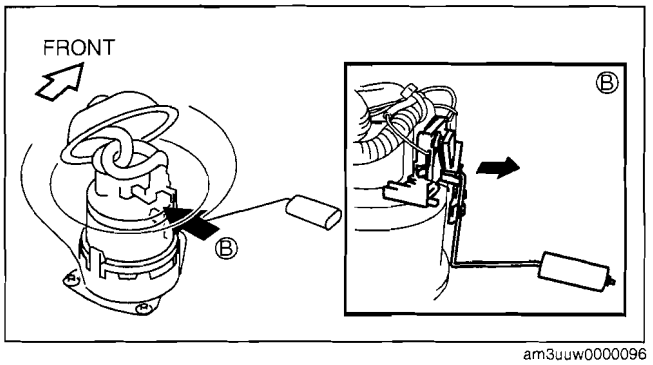
Fuel pump unit removal note

Note
- The fuel pump unit is secured by the two retainer clips with the bracket on the bottom surface of the fuel tank.



am3uuw0000096

1. Using a fiber stick, disengage the retainer clips until the pump can be removed.
2. Remove the fuel pump gauge connection area from the fuel pump unit.
3. Set the fuel pump gauge out of the way and remove the fuel pump unit from the fuel tank.



am3uuw0000096

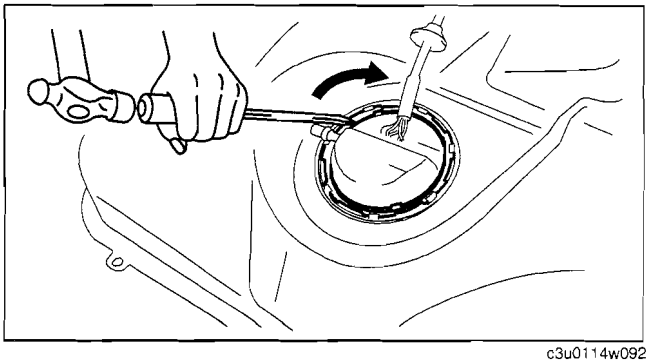
Fuel pump unit installation note

Note
- Keep the fuel pump gauge set out of the way.

1. Insert the fuel pump unit to the fuel tank.
2. Install the fuel pump gauge to the fuel pump unit.
3. Engage the retainer clips with the fuel pump unit.

Retainer ring installation note

1. Tap a retainer ring projection using a flathead screwdriver as shown in the figure and tighten the retainer until it is fixed in place.

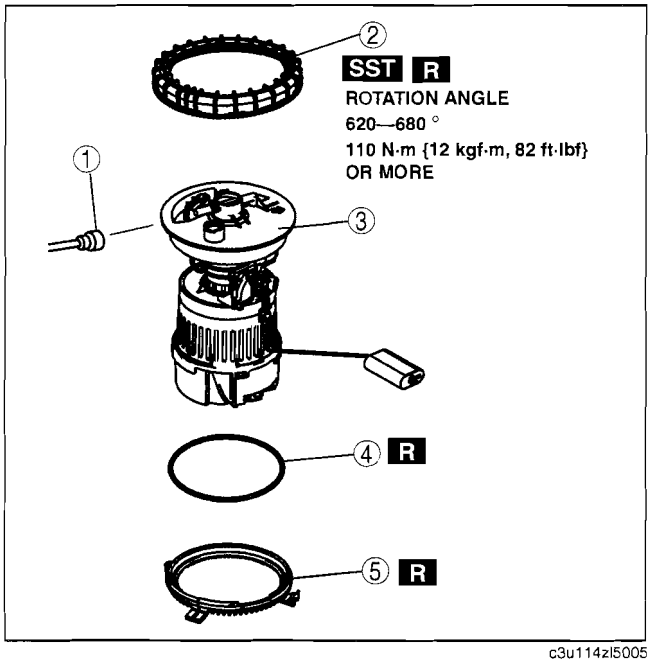


c3u0114w092

Except For California Emission Regulation Applicable Model

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the fuel tank. (See 01-14A-8 FUEL TANK REMOVAL/INSTALLATION[LF, L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

1	Quick release connector (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
2	Fuel pump cap (See 01-14A-16 Fuel pump cap removal note.) (See 01-14A-15 Fuel pump unit installation note.)
3	Fuel pump unit (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
4	Packing (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)
5	Retainer (See 01-14A-14 FUEL PUMP UNIT REMOVAL/ INSTALLATION[LF, L3].)



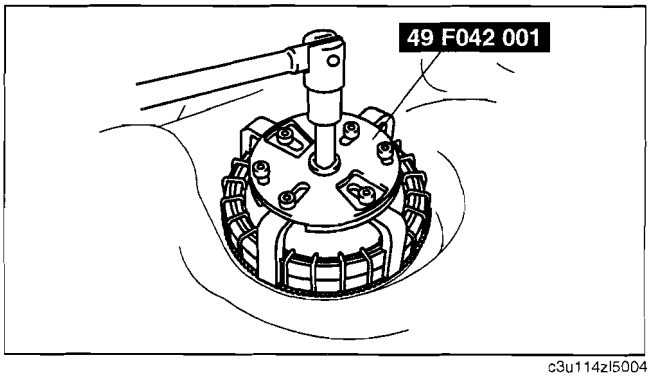
c3u114zl5005

Fuel pump cap removal note

Caution

- **The fuel pump cap could be damaged if the SST is used with any gap between the cap and the SST. Securely attach the SST so that there is no gap between the SST tabs and the side of the cap.**

1. Remove the fuel pump cap using the **SST**.



c3u114zl5004

Fuel pump cap installation note

Warning
- **Make sure there is no foreign material on each of the parts. If there is foreign material on the parts, the fuel pump unit cannot be assembled correctly, which could result in fuel leakage.**

Note
- The fuel pump unit will rotate and cannot be secured in the specified position if there is any gasoline on the gasket. Thoroughly wipe away all gasoline from the gasket.

1. Replace the packing, fuel pump cap and the retainer with new parts.

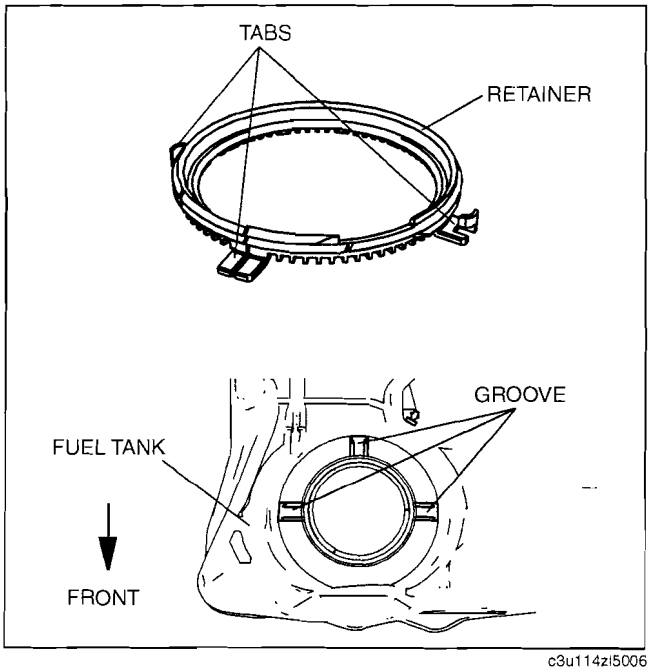
Caution
- **New parts can deform depending on the temperature. If the parts deform, the fuel pump unit cannot be assembled correctly, which could result in fuel leakage. Therefore, keep new parts at room temperature for the specified period of time to stabilize the shape.**

2. Leave new parts inside for the following period of time:

Stand-by time
12 h or more

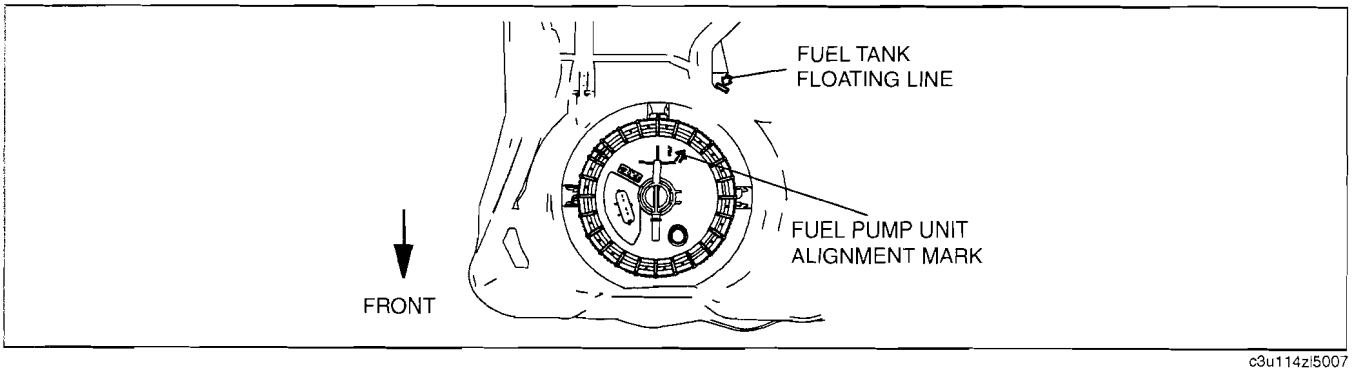
3. Install a new retainer to the fuel tank.
   (1) Align the retainer tabs (3 locations) with the fuel tank grooves.
   (2) Verify that the tabs are inserted into the grooves and the retainer is installed correctly.
   (3) Verify the retainer is not damaged.
4. Install a new packing to the fuel tank.
   (1) Verify the packing groove is clean and free of foreign material.
   (2) Install the packing to the fuel tank so that it is inserted into the fuel tank grooves.

Caution
- **Install the fuel pump unit to the fuel tank being careful not to bend the fuel sender unit arm. If the arm is bent, the fuel sender unit will not operate correctly.**



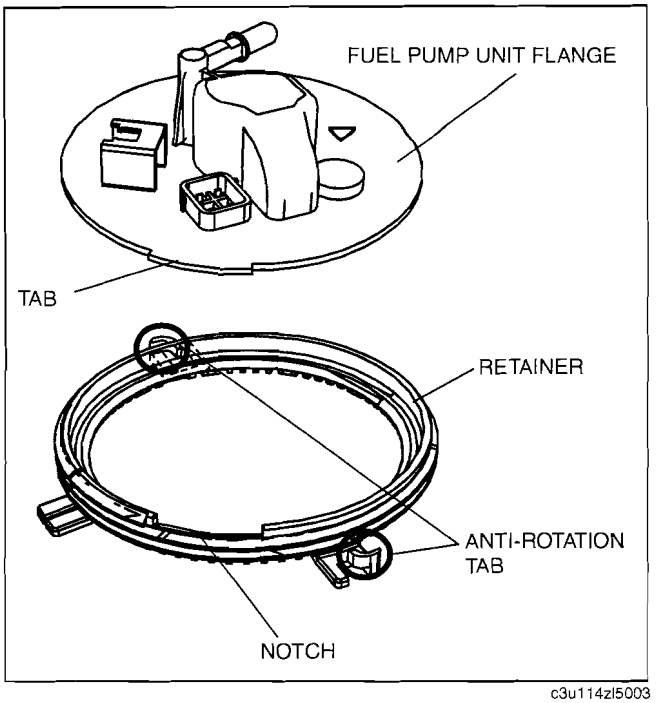
c3u114zl5006

5. Install the fuel pump unit to the fuel tank.
   (1) Align the fuel pump unit alignment mark and the floating line on the fuel tank.



c3u114zl5007

(2) Verify the tab on the fuel pump unit flange with the notch on the retainer.

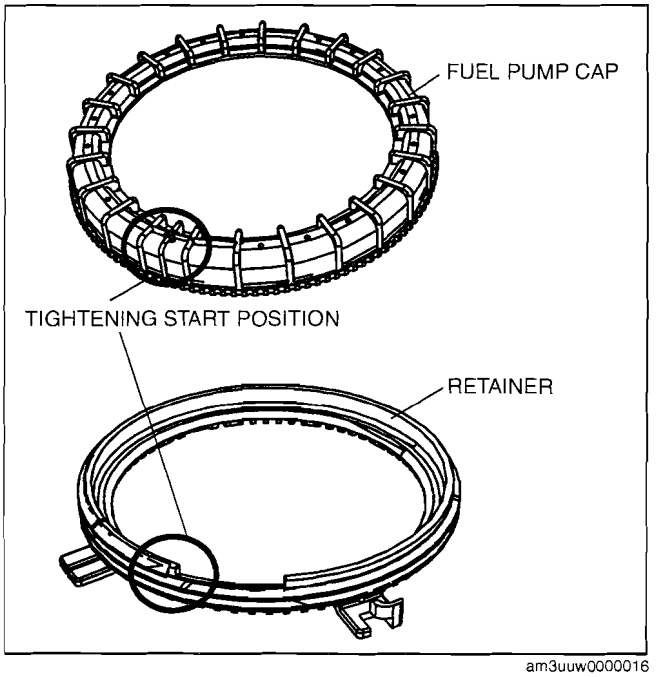


c3u114zl5003

6. Set on a new fuel pump cap.
   (1) Apply downward force (push down) on the center of the fuel pump unit flange.

Note
- Align the fuel pump cap with the tightening start position of the retainer and tighten the fuel pump cap with the start position as **0** °.
- The fuel pump cap tightening start position is the position where the spaces between the ribs become narrow. The retainer tightening start position is the notch position.

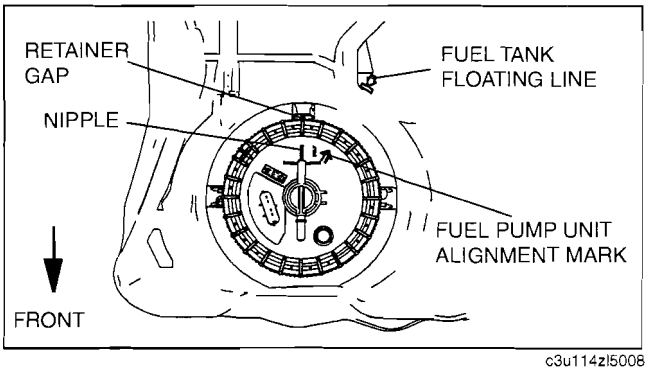
   (2) Align the tightening start position on the fuel pump cap and the tightening start point of the retainer.



am3uuw0000016

Warning

- **No grease or lubrication allowed on parts during installation. Parts could slide or they cannot be tightened to the specified torque. As a result, fuel leakage could occur.**
- **When tightening the fuel pump cap, be careful that the points indicated below have not deviated. If there is deviation, the fuel pump unit cannot be installed correctly, which could result in fuel leakage.**
  - **— The fuel pump unit alignment mark and the floating line on the fuel tank**
  - **— The fuel pump unit nipple and the retainer gap**

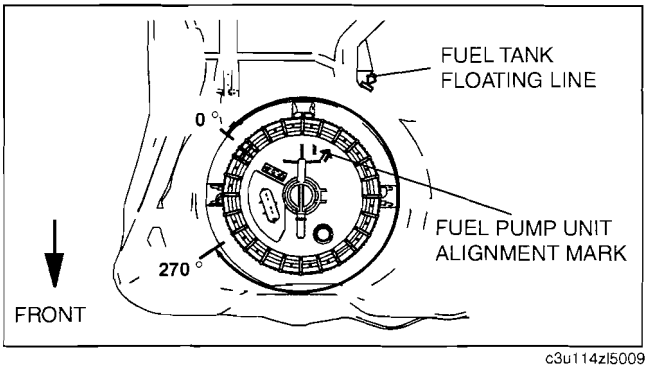


c3u114zl5008

7. Tighten the fuel pump cap.

(1) Tighten the fuel pump cap by hand to the specified angle or more until the flange is fixed.

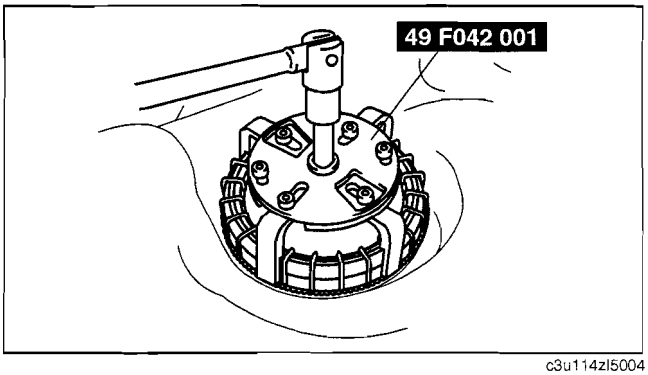
Fuel pump cap rotation angle
270 ° or more



c3u114zl5009

(2) Verify that the fuel pump cap is tightened correctly.
   1) The gap between the bottom of the fuel pump cap and the tank surface is even all around.
      - If the fuel pump cap is not tightened uniformly, loosen it by hand and re-install it.

(3) Install the **SST**.



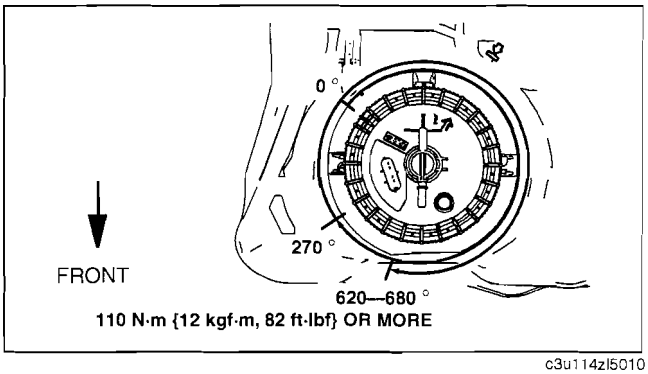
c3u114zl5004

Note

- The fuel pump cap rotation angle is the angle from the **0 °** position. The angle tightened to using the **SST** includes the angle tightened by hand.

(4) Tighten the fuel pump cap to the specified torque and to the specified angle or more.

Fuel pump cap rotation angle
620—680 °
Fuel pump cap tightening torque
110 N·m {12 kgf·m, 82 ft·lbf} or more



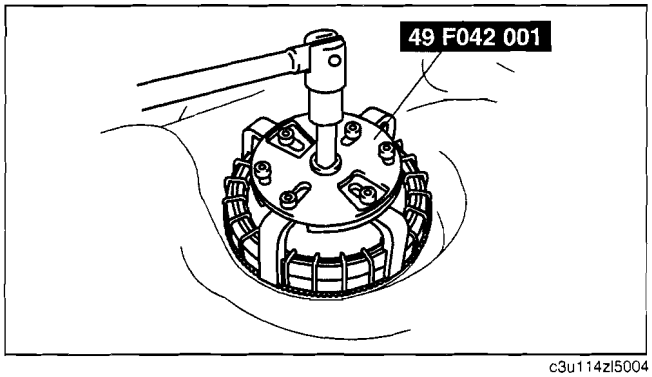
c3u114zl5010

(5) Verify that the fuel pump cap is tightened correctly.
1) The gap between the top of the fuel pump unit flange and the fuel pump cap is even all around.
- If it is not tightened uniformly, re-install it using the following procedure.

2) The gap between the fuel pump unit and fuel tank is even all around.
- If it is not tightened uniformly, re-install it using the following procedure.

3) Verify that the fuel pump unit alignment mark and the floating line on the fuel tank are aligned.
- If they are not aligned, re-install it using the following procedure.

4) Verify that the fuel pump unit nipple and the retainer gap are aligned.
- If it is not aligned, re-install using the following procedure.
  1. Install the **SST**.
  2. Remove the fuel pump cap, fuel pump unit, packing, and retainer.
  3. Verify that the retainer is not damaged.
     - If both of the retainer anti-rotation tabs are broken, replace it with new one.
  4. Return to Step 2 and re-install.



c3u114zl5004

FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY[LF, L3]

id0114a4801000

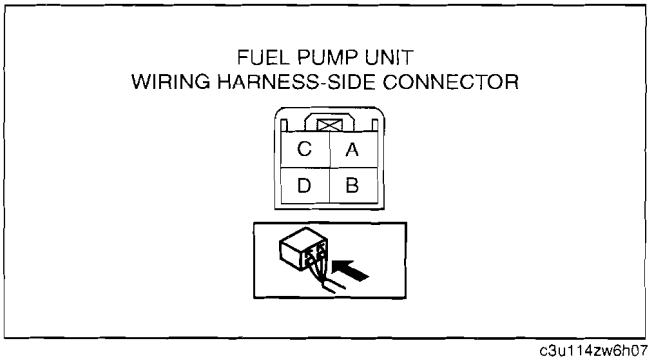
Note
- The fuel pump unit cannot be disassembled.

FUEL PUMP UNIT INSPECTION[LF, L3]

id0114a4801100

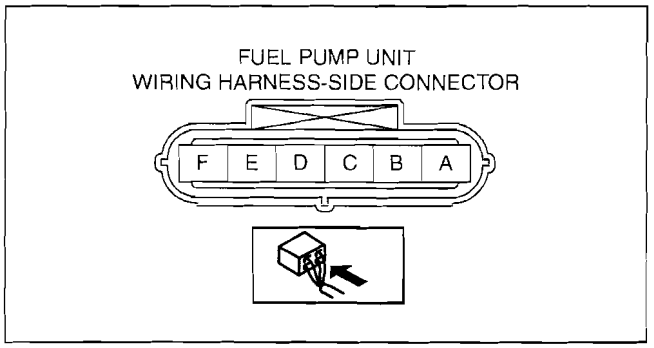
Continuity Inspection
1. Disconnect the negative battery cable.
2. Disconnect the fuel pump unit connector.
3. Inspect for continuity between the following fuel pump unit terminals.

California emission regulation applicable model
- B and C



c3u114zw6h07

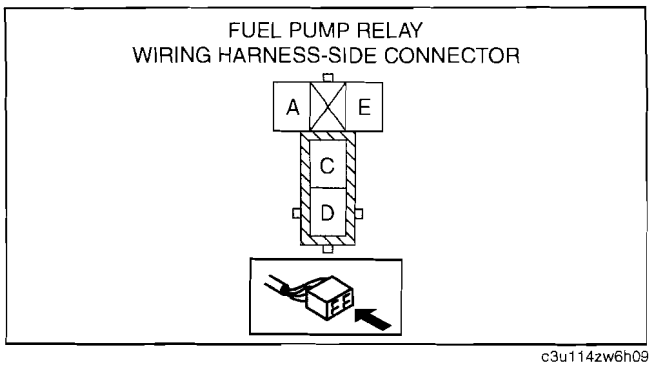
Except for California emission regulation applicable model
- A and E
- If there is continuity, perform the "Circuit Open/Short Inspection".
- If there is no continuity, replace the fuel pump.



c3u114zw6h08

Circuit Open/Short Inspection

1. Inspect the following wiring harnesses for open or short circuit (continuity check).



c3u114zw6h09

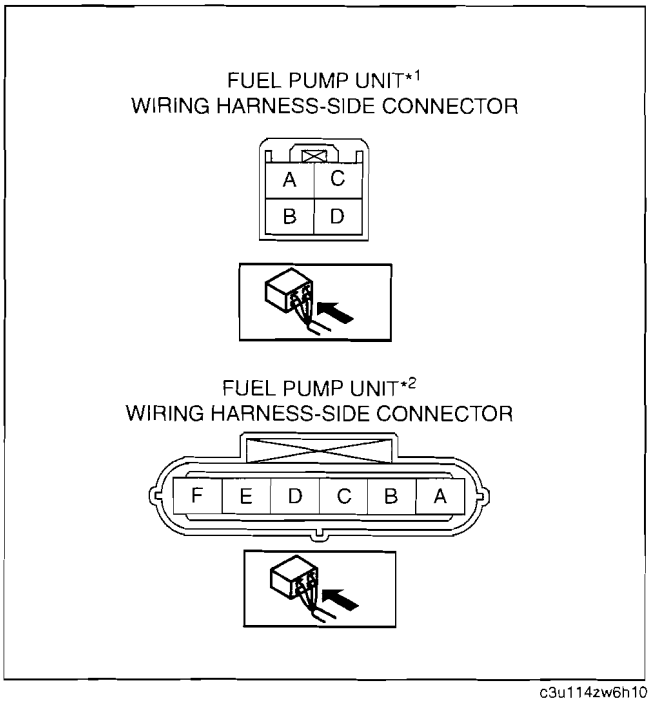
Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the harness.
  - — Fuel pump unit terminal C*1, A*2 and fuel pump relay terminal C
  - — Fuel pump unit terminal B*1, E*2 and body ground

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the harness.
  - — Fuel pump unit terminal C*1, A*2 and body ground
  - — Fuel pump unit terminal B*1, E*2 and power supply

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model



c3u114zw6h10

Fuel Static Pressure Inspection

Note

- The fuel static pressure inspection cannot be performed because the pressure regulator is integrated with the fuel pump unit.

QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3]

id0114a4804800

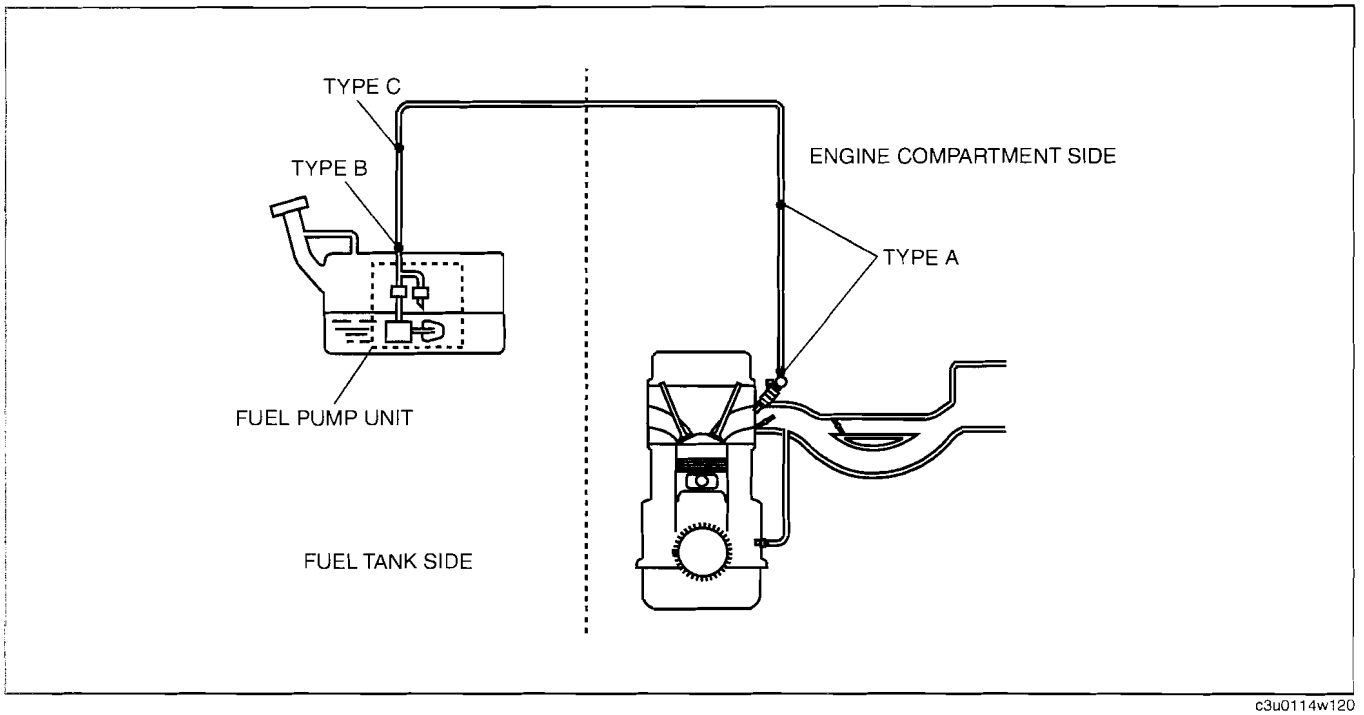
Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION".**

Quick Release Connector Type

Caution

- **There are three types of quick release connectors. Verify the type and location, and install/remove properly.**



c3u0114w120

Type A Removal

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)

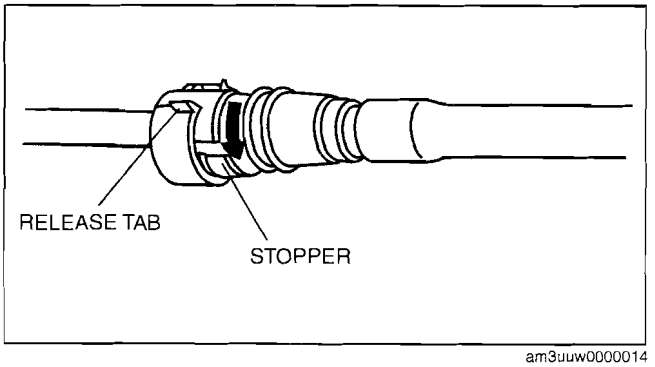
Caution

- **The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.**

Note

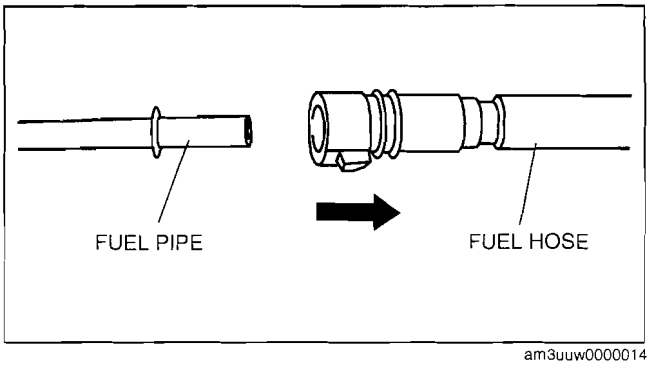
- The fuel hose can be removed by pushing it to the pipe side to release the lock.

2. Rotate the release tab on the quick release connector to the stopper position.



am3uuw0000014

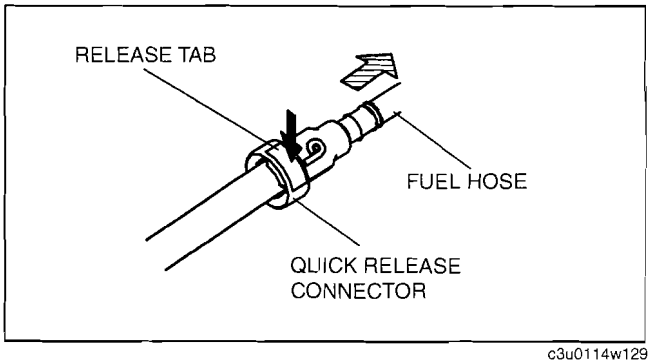
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



am3uuw0000014

Type B Removal

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Push the release tab on the retainer to unlock.
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



c3u0114w129

Type C Removal

Caution

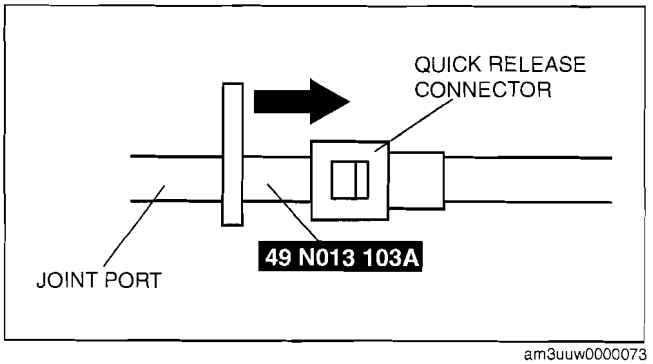
- **Be careful not to damage the pipe when unlocking the retainer.**

Note

- When a prompt connector is detached, following SST can be used.
  - — **49 N013 103A**
  - — **49 E042 001**

When using SST 49 N013 103A

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Verify that the quick release connector joint area is free of foreign material. Clean if necessary.
3. Install the **SST** as shown in the figure and push into the quick release connector to disconnect the fuel pipe.
4. Cover the disconnected quick release connector and fuel pipe to prevent them from being scratched or contaminated with foreign material.



am3uuw0000073

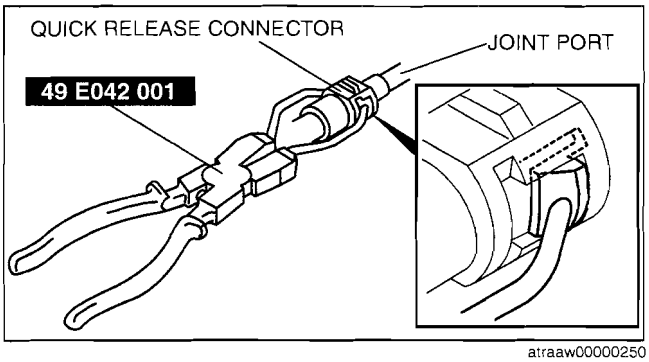
When using SST 49 E042 001

Note
- If the quick release connector is removed, replace the retainer with a new one.

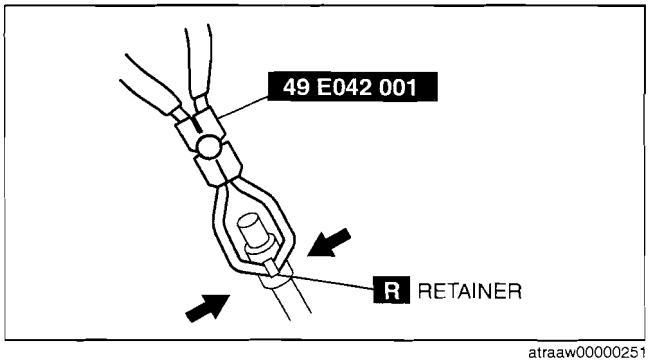
1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations.(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Set the **SST** parallel to the quick release connector.

Note
- The quick release connector can be removed by pushing the center of the retainer tabs.
- The retainer is attached to the pipe even after the connector is disconnected.

3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.
4. Pull the connector side and disconnect the quick release connector.
5. Raise a retainer tab using the **SST** and remove the retainer.
6. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.



atraaw00000250

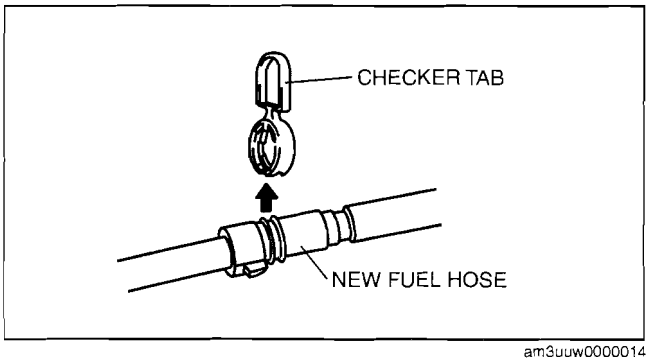


atraaw00000251

Type A Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.

1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
3. Reconnect the fuel hose straight to the fuel pipe until a click is heard.



am3uuw0000014

Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.
5. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

Type B Installation

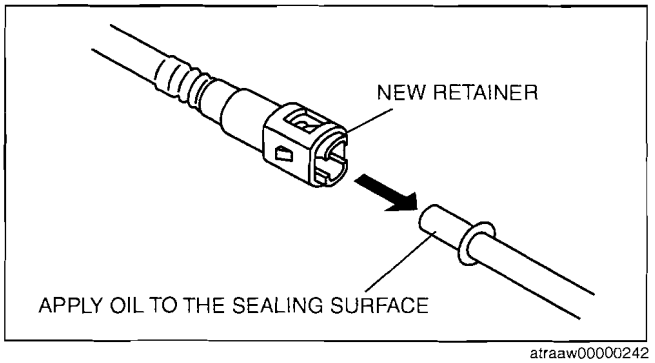
Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.

1. inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Reconnect the fuel hose straight to the fuel pipe until a click is heard.
3. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
4. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

Type C Installation

Note
- Use only the designated genuine retainer when replacing the retainer.

1. Verify that the sealing surfaces of the fuel hose or fuel pipe have no damage or deformation. Replace if necessary.
   - If the O-ring of the quick release connector is damaged or displaced, replace the fuel hose.
2. Install a new retainer to the quick release connector, then visually verify that the retainer tab is installed securely to the connector.
3. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
4. Push the quick release connector into the fuel pipe until a click is heard.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.
   - If the quick release connector does not move at all, verify that the O-ring is not damaged or has slipped, and then reconnect the connector.
6. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)



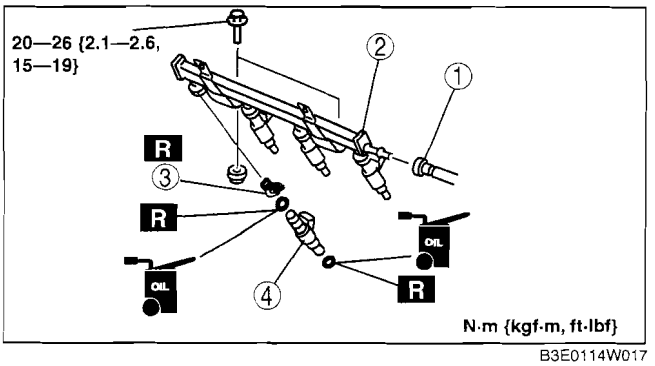
atraaw00000242

FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3]

id0114a4800600

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Remove the plug hole plate.
3. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the negative battery cable.
5. Disconnect the fuel injector connector.
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

1	Quick release connector (See 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3], 01-14A-22 QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION[LF, L3].)
2	Fuel distributor
3	Injector clip (See 01-14A-26 Fuel Injector Removal Note.)
4	Fuel injector (See 01-14A-26 Fuel Injector Installation Note.)

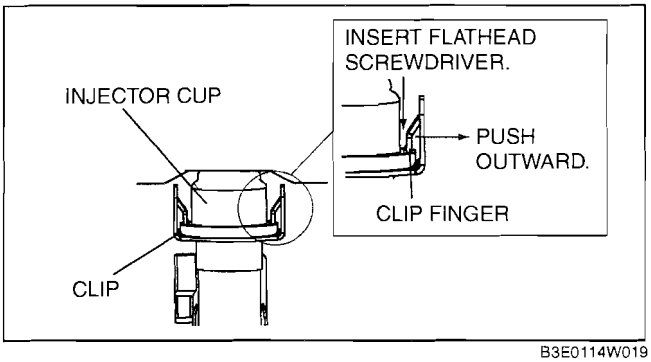


B3E0114W017

Fuel Injector Removal Note

Caution
- **Use of a deformed injector clip will cause the fuel injector to be connected incorrectly and could result in fuel leakage. It will also cause the injector to rotate. Therefore, always replace the clip when the injector is removed.**

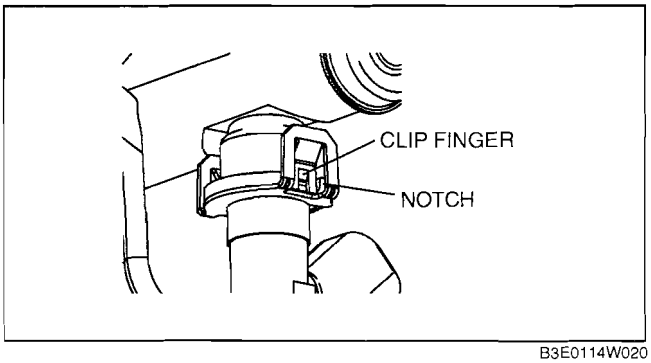
1. Insert a flathead screwdriver between the injector cup and clip finger.



B3E0114W019

Note
- When pushing the clip finger outward, deform the finger until it is removed completely from the cup notch.

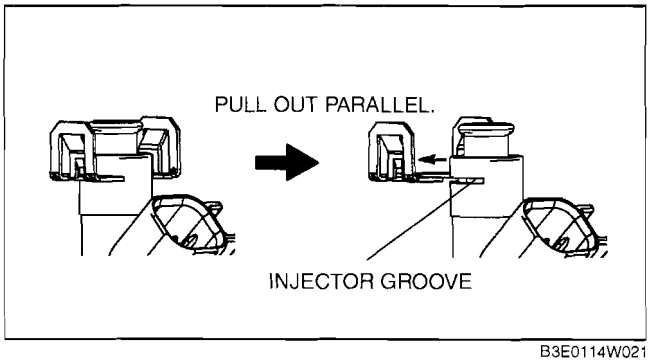
2. Push the clip finger outward using a flathead screwdriver.
3. Remove the injector with the clip.
4. Remove the clip from the fuel injector using the following procedure:



B3E0114W020

Note
- The clip will not be reused.

(1) Hold the clip using pliers.
(2) Pull the clip parallel to the injector groove and remove it from the injector.

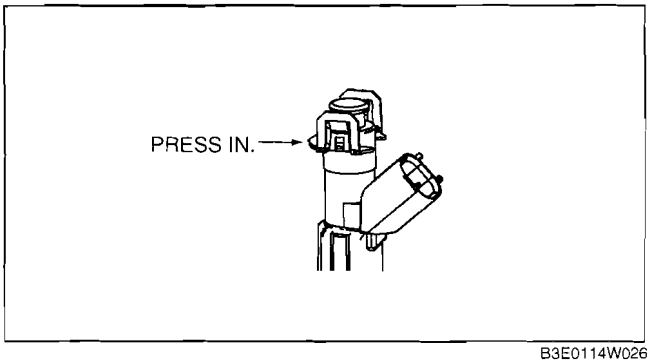


B3E0114W021

Fuel Injector Installation Note
1. Verify that the O-ring is not damaged.
   - If there is any damage, replace the O-ring.
2. Apply a small amount of clean oil to the injector groove and the O-ring.
3. Temporarily attach a new clip to the injector groove.

Note
- When the clip is attached correctly, the central area of the injector and the clip finger positions are aligned.

4. Hold the injector firmly and push the clip into the injector until the clip stops sliding.
5. Verify that the injector connector position is correct.
6. Press the injector into the injector cup. Continue pressing until the clip contacts the lower surface of the injector cup.
7. Verify that the injector and clip are correctly installed with the clip locked onto the injector cup notch.



B3E0114W026

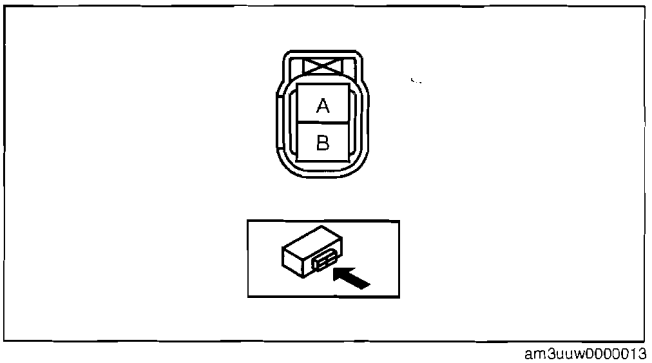
FUEL INJECTOR INSPECTION[LF, L3]

id0114a4800700

Resistance Inspection

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable.
3. Disconnect the fuel injector connector.
4. Inspect the resistance between fuel injector terminals A and B using a tester.
   - If within the specification, perform the "Circuit Open/Short Inspection".
   - If not within the specification, replace the fuel injector.

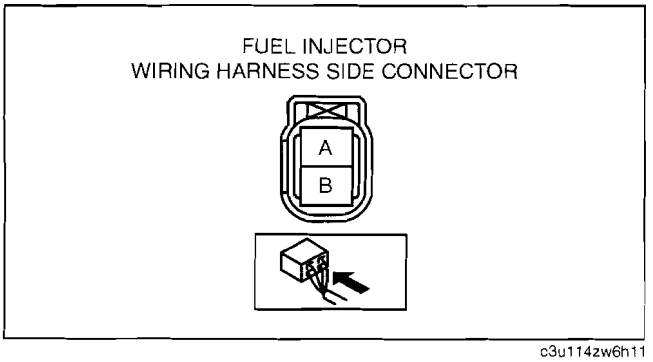
Fuel injector resistance
California emission regulation applicable model: 13.1—14.5 ohms [20 °C {68 °F}]
Except for California emission regulation applicable model: 11.4—12.6 ohms [20 °C {68 °F}]



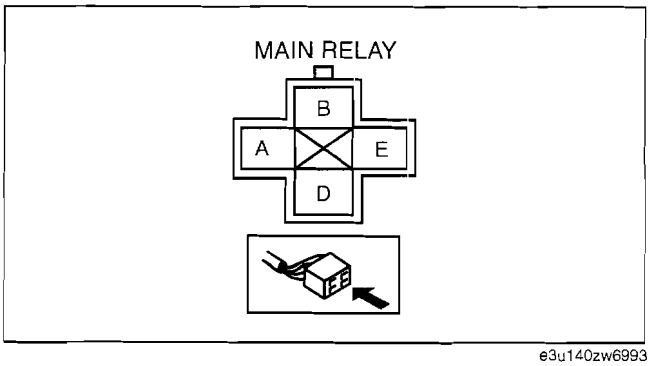
am3uuw0000013

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



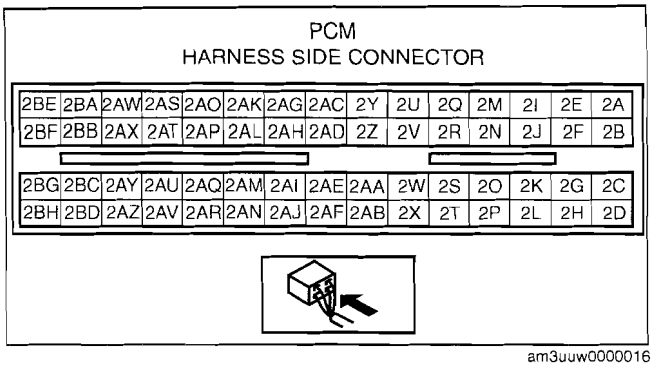
c3u114zw6h11



e3u140zw6993

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Fuel injector No.1 terminal A and PCM terminal 2BB
  - — Fuel injector No.2 terminal A and PCM terminal 2BC
  - — Fuel injector No.3 terminal A and PCM terminal 2BD
  - — Fuel injector No.4 terminal A and PCM terminal 2AZ
  - — Fuel injector No.1 terminal B and main relay terminal A
  - — Fuel injector No.2 terminal B and main relay terminal A
  - — Fuel injector No.3 terminal B and main relay terminal A
  - — Fuel injector No.4 terminal B and main relay terminal A



am3uuw0000016

Short circuit

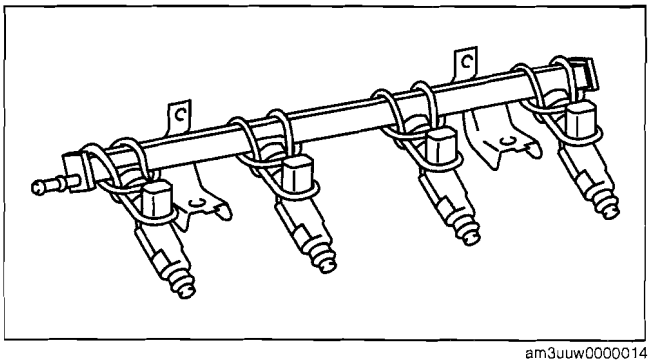
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Fuel injector No.1 terminal A and body ground
  - — Fuel injector No.2 terminal A and body ground
  - — Fuel injector No.3 terminal A and body ground
  - — Fuel injector No.4 terminal A and body ground

Leakage Inspection

Warning

- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.**

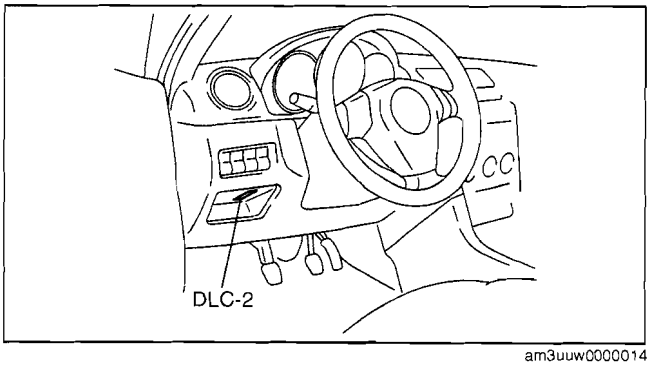
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the fuel injector and fuel distributor as a single unit. (See 01-14A-25 FUEL INJECTOR REMOVAL/ INSTALLATION[LF, L3].)
4. Fix the fuel injector to the fuel distributor with a wire or the equivalent.
5. Connect the fuel hose.
6. Start the fuel pump using the following procedure:



am3uuw0000014

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.



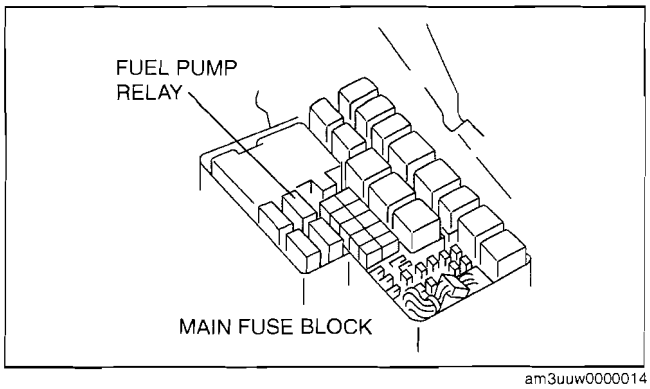
am3uuw0000014

Without using M-MDS

1. Remove the fuel pump relay.

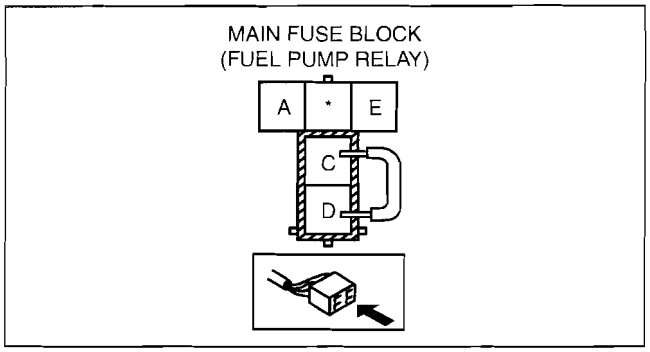
Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000014

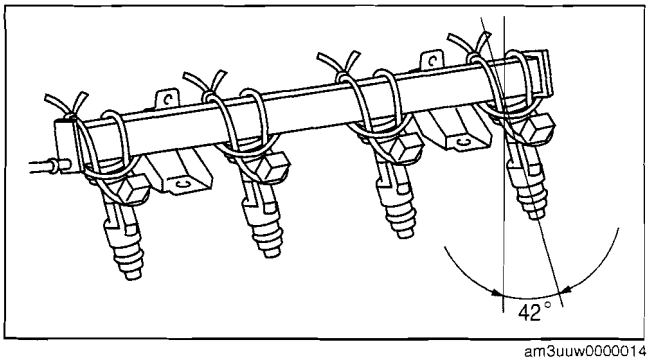
2. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.



ada3912w333

7. Tilt the fuel injector at an angle of **42°** to inspect for leakage.
   - If not within the specification, replace the fuel injector.

Standard
Less than 1 drop/2 min



am3uuw0000014

8. Stop the fuel pump using the following procedure:
   Using M-MDS
   1. Stop the fuel pump using the "FP" simulation function.
   Without using M-MDS
   1. Disconnect the negative battery cable to stop the fuel pump.
9. Disconnect the negative battery cable. (using M-MDS)
10. Remove the wire or equivalent securing the fuel injector.
11. Install the fuel injector. (See 01-14A-25 FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3].)
12. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

Injection Volume Inspection

Warning

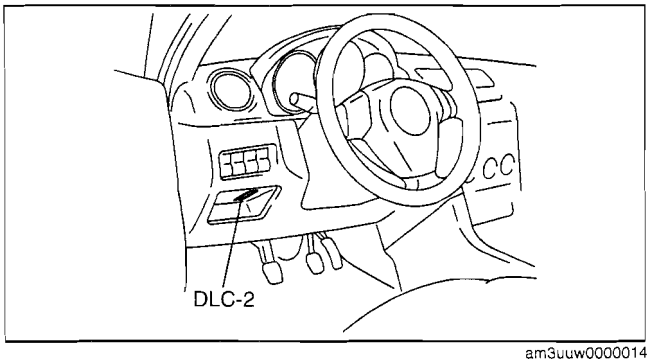
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.**

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the fuel injector. (See 01-14A-25 FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3].)
4. Connect the fuel injector to the fuel injector tester.
5. Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.

Without using M-MDS

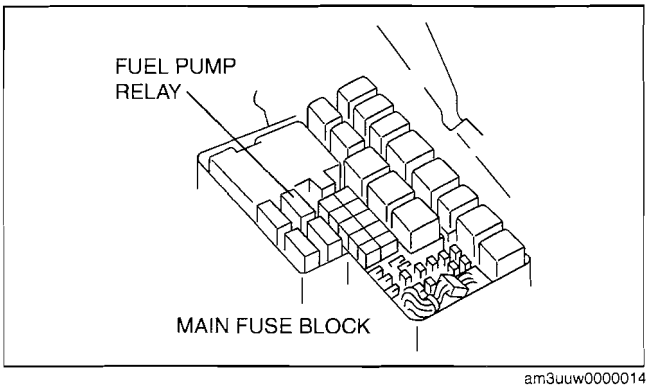


am3uuw0000014

1. Remove the fuel pump relay.

Caution

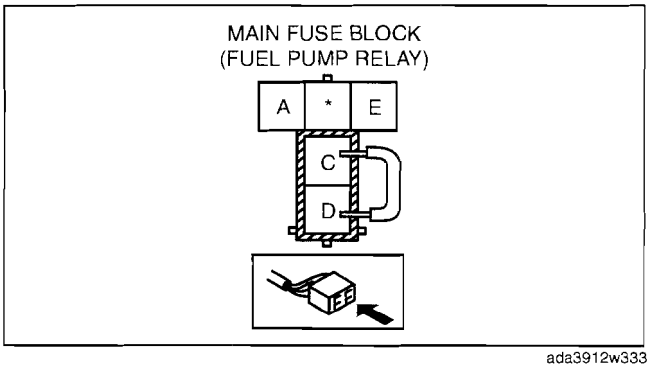
- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000014

2. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.

6. Measure the injection volume of each fuel injector.
   - If not within the specification, replace the fuel injector.



ada3912w333

Standard

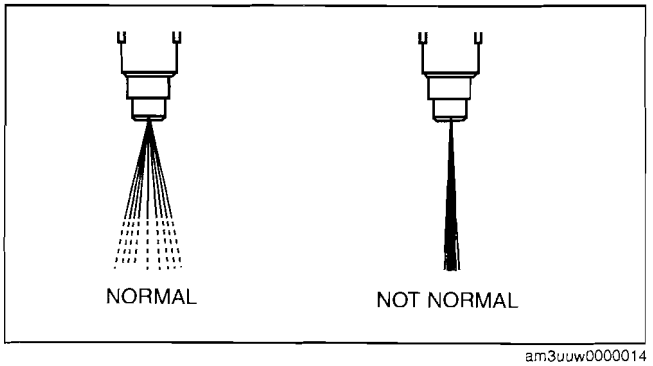
California emission regulation applicable model: 260—320 ml {260—320 cc, 15.9—19.5 cu in}/min

Except for California emission regulation applicable mode: 195—245 ml {195—245 cc, 11.9—14.9 cu in}/min

7. Disconnect the negative battery cable.
8. Install the fuel injector. (See 01-14A-25 FUEL INJECTOR REMOVAL/INSTALLATION[LF, L3].)
9. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)

Atomization Inspection

1. Inspect the atomization status.
   - If not normal, replace the fuel injector.



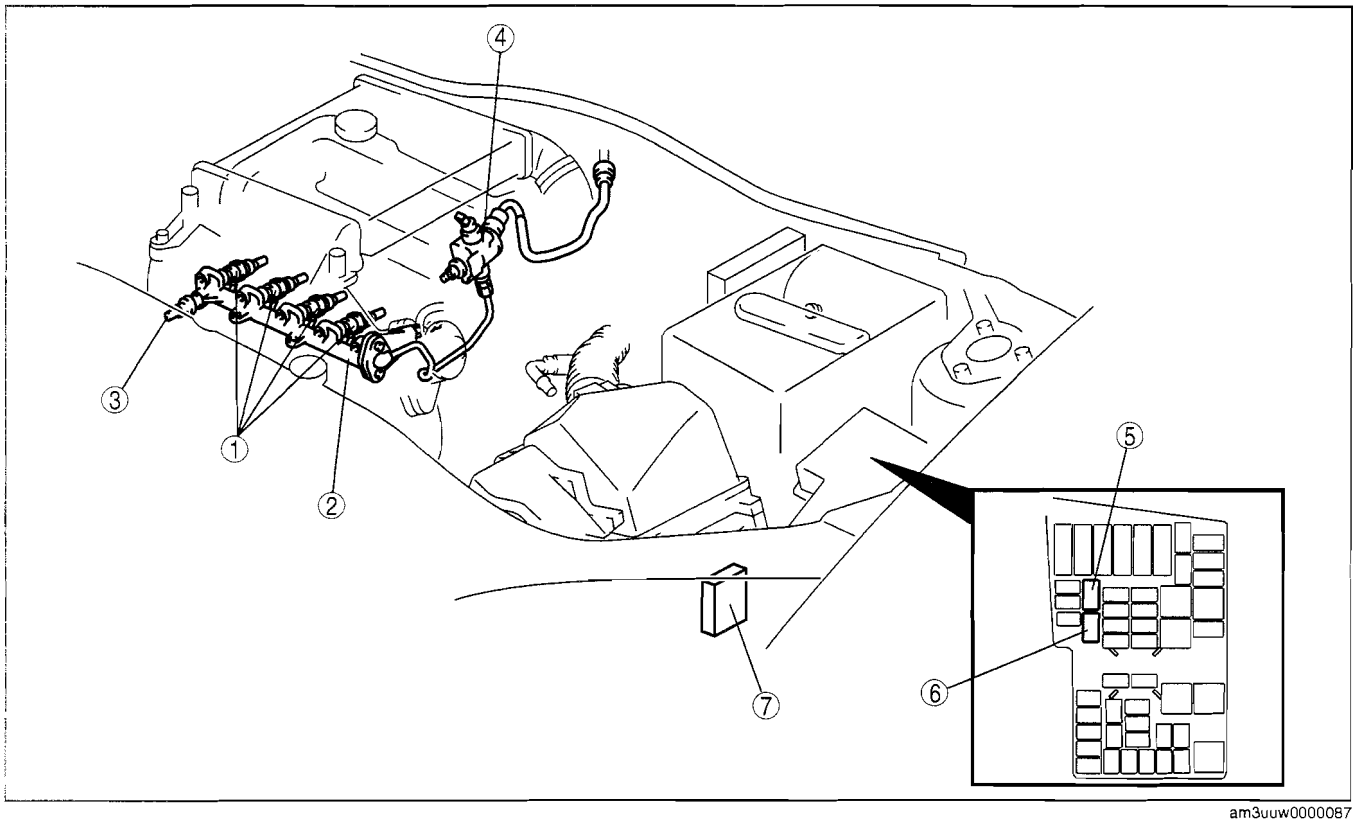
am3uuw0000014

01-14B FUEL SYSTEM [L3 WITH TC]

FUEL SYSTEM LOCATION INDEX[L3 WITH TC]

id011439800100

Engine Compartment Side

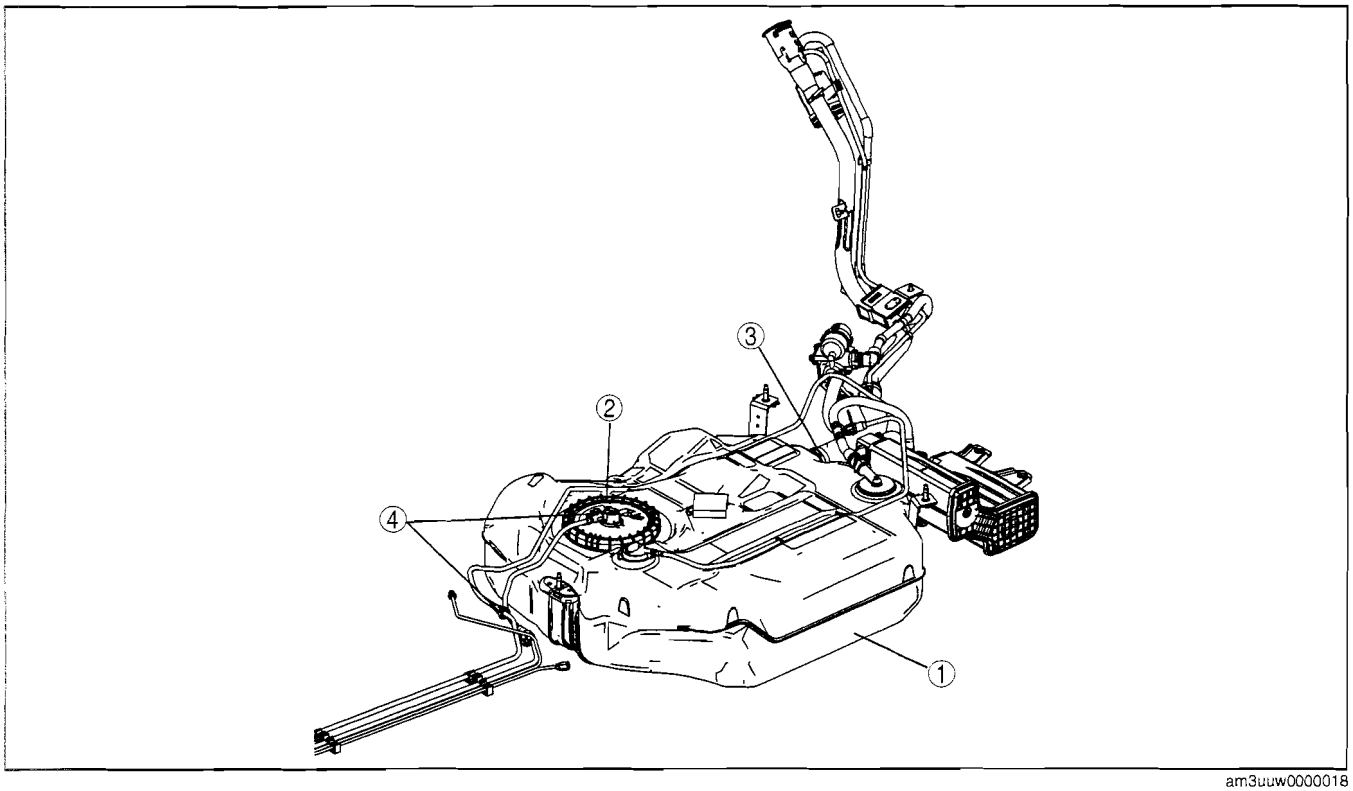


am3uuw0000087

1	Fuel injector (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-14B-33 FUEL INJECTOR INSPECTION[L3 WITH TC].)
2	Fuel delivery pipe (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)
3	Fuel pressure sensor (See01-14B-30 FUEL INJECTOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)

4	High pressure fuel pump (See01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].) (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].)
5	Fuel pump relay
6	Fuel pump speed control relay
7	Fuel pump resistor (See01-14B-20 FUEL PUMP RESISTOR REMOVAL/INSTALLATION[L3 WITH TC].) (See01-14B-20 FUEL PUMP RESISTOR INSPECTION[L3 WITH TC].)

Fuel Tank Side



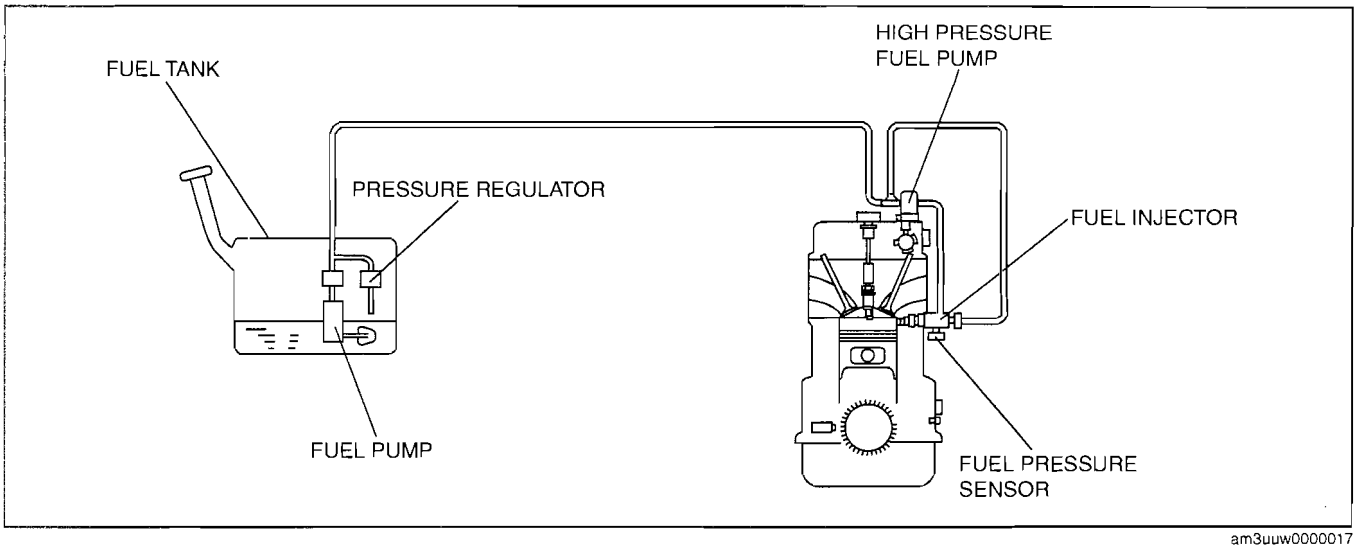
am3uuw0000018

1	Fuel tank (See01-14B-8 FUEL TANK REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-14B-11 FUEL TANK INSPECTION[L3 WITH TC].)
2	Fuel pump unit (See01-14B-12 FUEL PUMP UNIT REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-14B-17 FUEL PUMP UNIT DISASSEMBLY/ ASSEMBLY[L3 WITH TC].) (See01-14B-17 FUEL PUMP UNIT INSPECTION[L3 WITH TC].)

3	Nonreturn valve (See01-14B-12 NONRETURN VALVE INSPECTION[L3 WITH TC]01-14B-12 FUEL PUMP UNIT REMOVAL/INSTALLATION[L3 WITH TC].)
4	Quick release connector (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)

FUEL SYSTEM DIAGRAM[L3 WITH TC]

id011439800200



am3uuw0000017

BEFORE SERVICE PRECAUTION[L3 WITH TC]

id011439802000

Warning

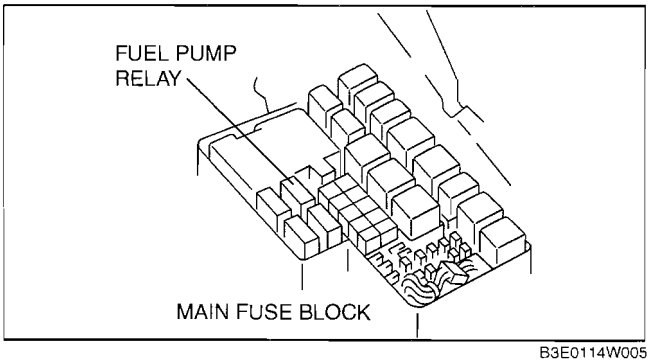
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure".**
- **A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before performing work on the fuel system, discharge static electricity by touching the vehicle body.**

Caution

- **If there is foreign material on the connecting area of the quick release connector, it might damage the connector or fuel pipe. To prevent this, disconnect the connector and clean the connecting area before connecting.**

Fuel Line Safety Procedure

1. Remove the fuel-filler cap to release the pressure inside the fuel tank.
2. Remove the fuel pump relay.
3. Start the engine.
4. After the engine stalls, crank the engine **several times**.
5. Turn the ignition switch to the LOCK position.
6. Install the fuel pump relay.



B3E0114W005

AFTER SERVICE PRECAUTION[L3 WITH TC]

id011439801900

Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Leakage Inspection".**

Fuel Leakage Inspection

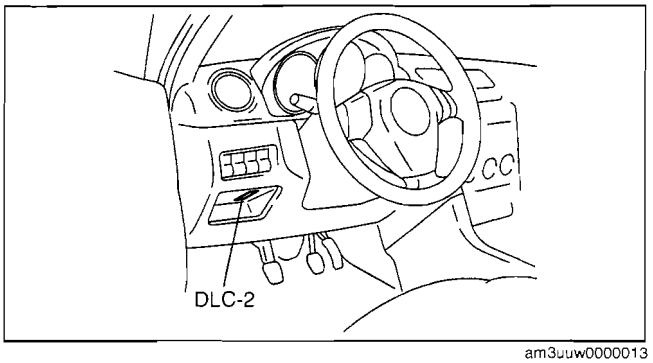
Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, complete the following inspection with the engine stopped.**

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.
3. Verify that there is no fuel leakage from the pressurized parts.
   - If there is leakage, replace the fuel hoses and clips.
   - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard
There shall be no leakage after 5 min.



am3uuw0000013

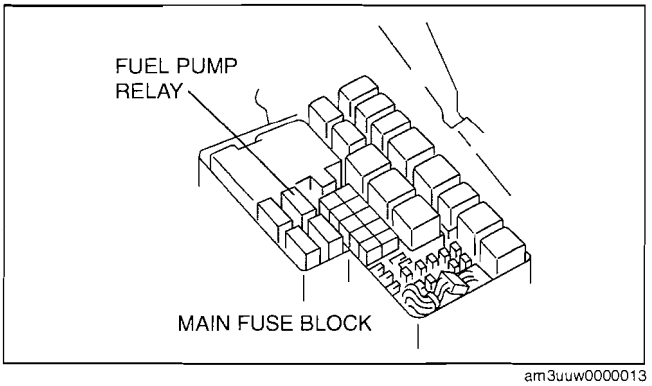
4. After reinstallation, repeat step 2—3 in the fuel leakage inspection.

Without using M-MDS

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the fuel pump relay.

Caution

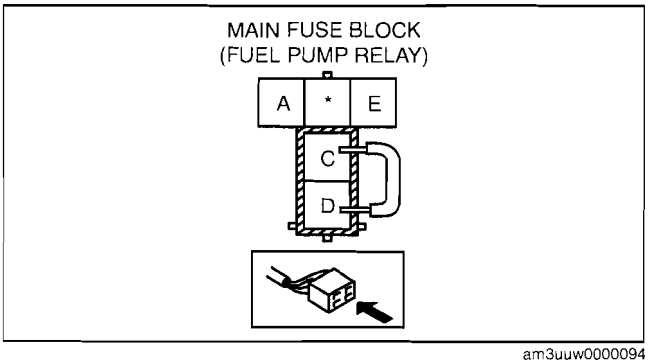
- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000013

4. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.
5. Verify that there is no fuel leakage from the pressurized parts.
   - If there is leakage, replace the fuel hoses and clips.
   - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard
There shall be no leakage after 5 min.



am3uuw0000094

6. After reinstallation, repeat step 3—4 in the fuel leakage inspection.

FUEL LINE PRESSURE INSPECTION[L3 WITH TC]

id011439800500

Low Pressure Line (From the Fuel Tank to the High Pressure Fuel Pump)

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE SERVICE PRECAUTION". (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)**

Caution

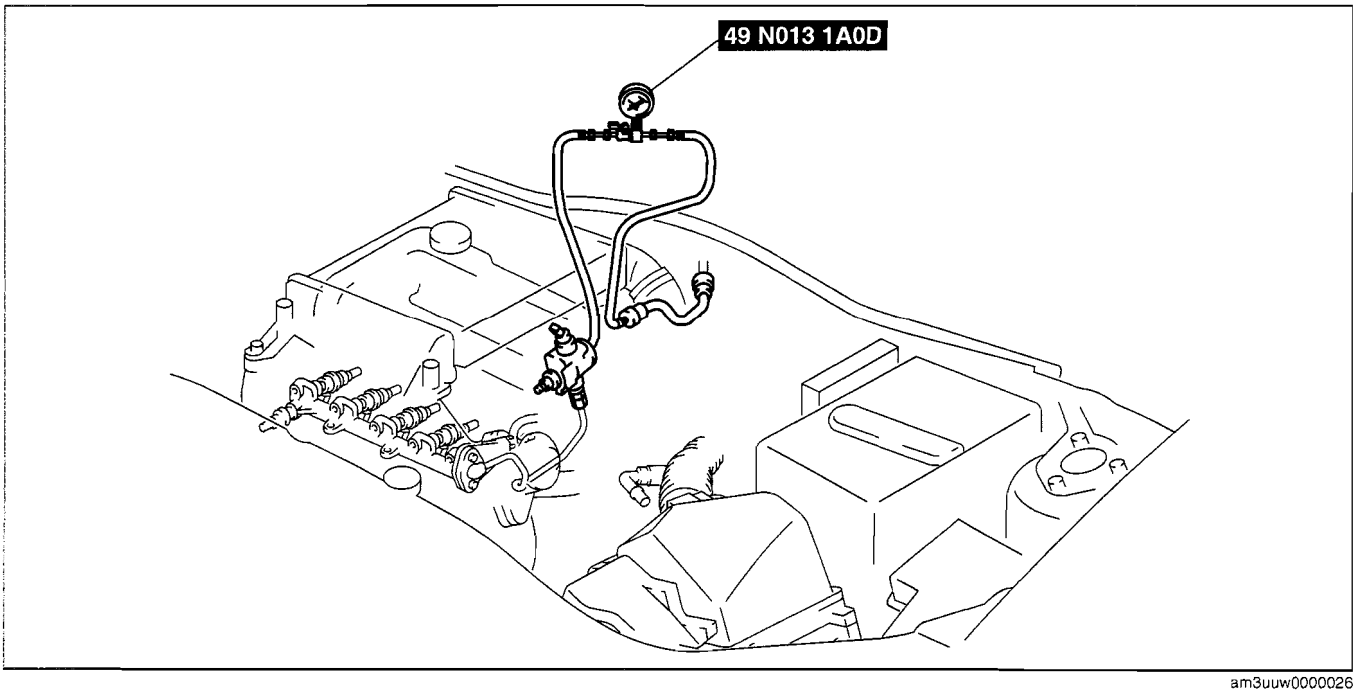
- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE SERVICE PRECAUTION". (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.

Caution

- **The quick release connector may be damaged if the tab is turned too far. Do not turn the tab over the stopper.**

4. Disconnect the quick release connector from the fuel tank. (See01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
5. Push the **SST** quick release connector into the fuel pipe and plastic fuel hose into the **SST** until a click is heard.
6. Turn the lever parallel to the hose of the **SST** as shown.

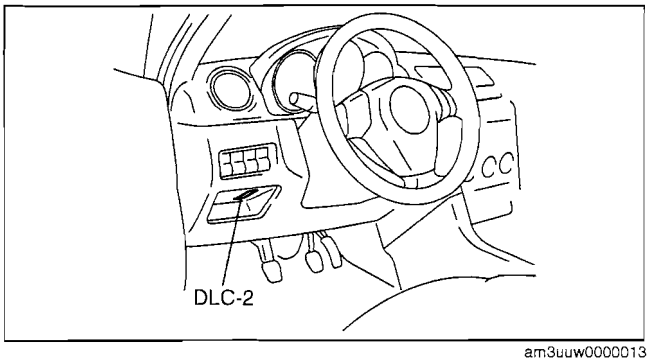


am3uuw0000026

7. Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.



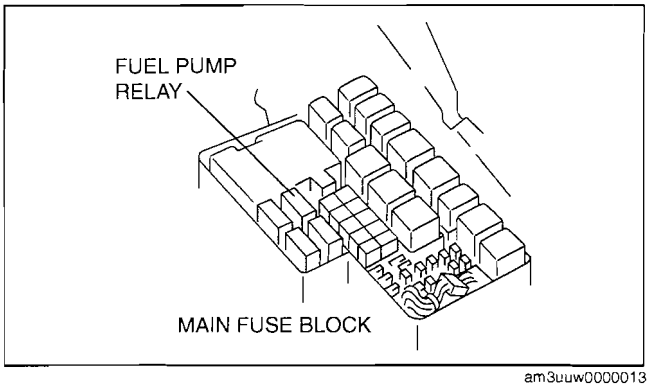
am3uuw0000013

Without using M-MDS

1. Remove the fuel pump relay.

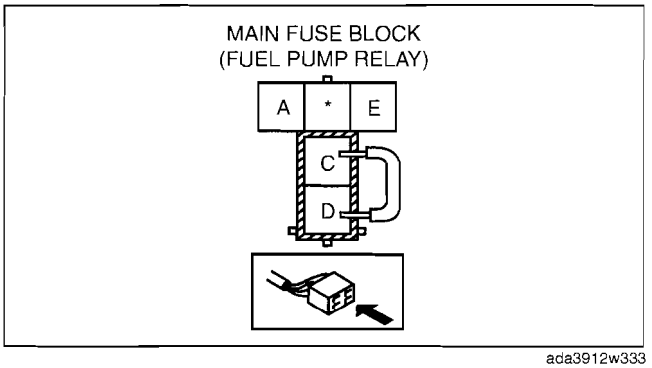
Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000013

2. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.



ada3912w333

8. Operate the fuel pump for **10 s**.
9. Measure the fuel line pressure.
   - If not as specified, inspect the following:
     Zero or low
     — FP circuit
     — FP
     — Fuel line (clogged)
     — Fuel leakage inside pressure regulator
     High
     — Pressure regulator for high pressure cause

Fuel line pressure

410—490 kPa {4.2—4.9 kgf/cm^2, 60—71 psi}

10. Turn the ignition switch to the LOCK position.
11. Measure the fuel hold pressure **after 5 min.**
    - If not as specified, inspect the following:
      — FP hold pressure
      — Fuel injector for leakage
      — Fuel line for improper routing, kinks or leakage

Fuel hold pressure

More than 230 kPa {2.3 kgf/cm^2, 33 psi}

12. Disconnect the **SST.**
13. Connect the quick release connector. (See01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
14. Complete the "AFTER SERVICE PRECAUTION". (See01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC])

High Pressure Line (From the High Pressure Fuel Pump to the Fuel Injector)

1. Inspect the fuel pressure sensor. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)
2. Inspect the high pressure fuel pump. (See01-14B-23 HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC].)

FUEL TANK REMOVAL/INSTALLATION[L3 WITH TC]

id011439801600

Warning

- **Repairing a fuel tank containing fuel is dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.**
- **A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.**

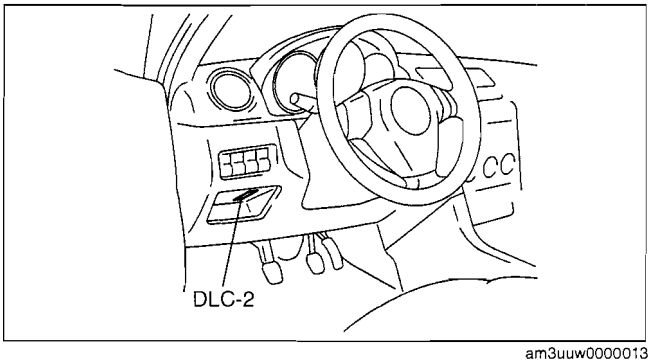
1. Park the vehicle on a level surface.
2. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
3. Drain the fuel from the fuel tank using the following procedure:
   (1) Disconnect the quick release connector (in the engine compartment). (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
   (2) Attach a long hose to the disconnected fuel pipe and drain the fuel into a proper receptacle.
   (3) Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the M-MDS to the DLC-2.
2. Start the fuel pump using the "FP" simulation function.

Without using M-MDS

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.

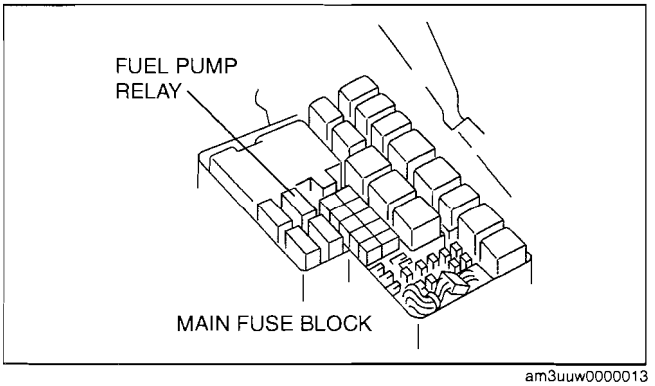


am3uuw0000013

3. Remove the fuel pump relay.

Caution

- **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**

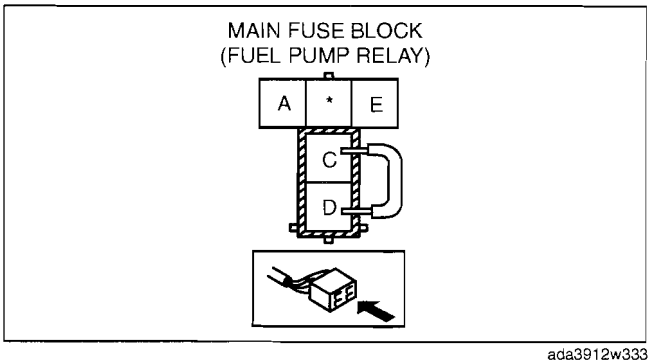


am3uuw0000013

4. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.

Caution

- **The fuel pump may malfunction if it is operated without any fuel in the fuel tank (fuel pump idling). Constantly monitor the amount of fuel being discharged and immediately stop operation of the pump when essentially no fuel is being discharged.**



ada3912w333

(4) When essentially no fuel is being discharged from the hose, stop the fuel pump using the following procedure:

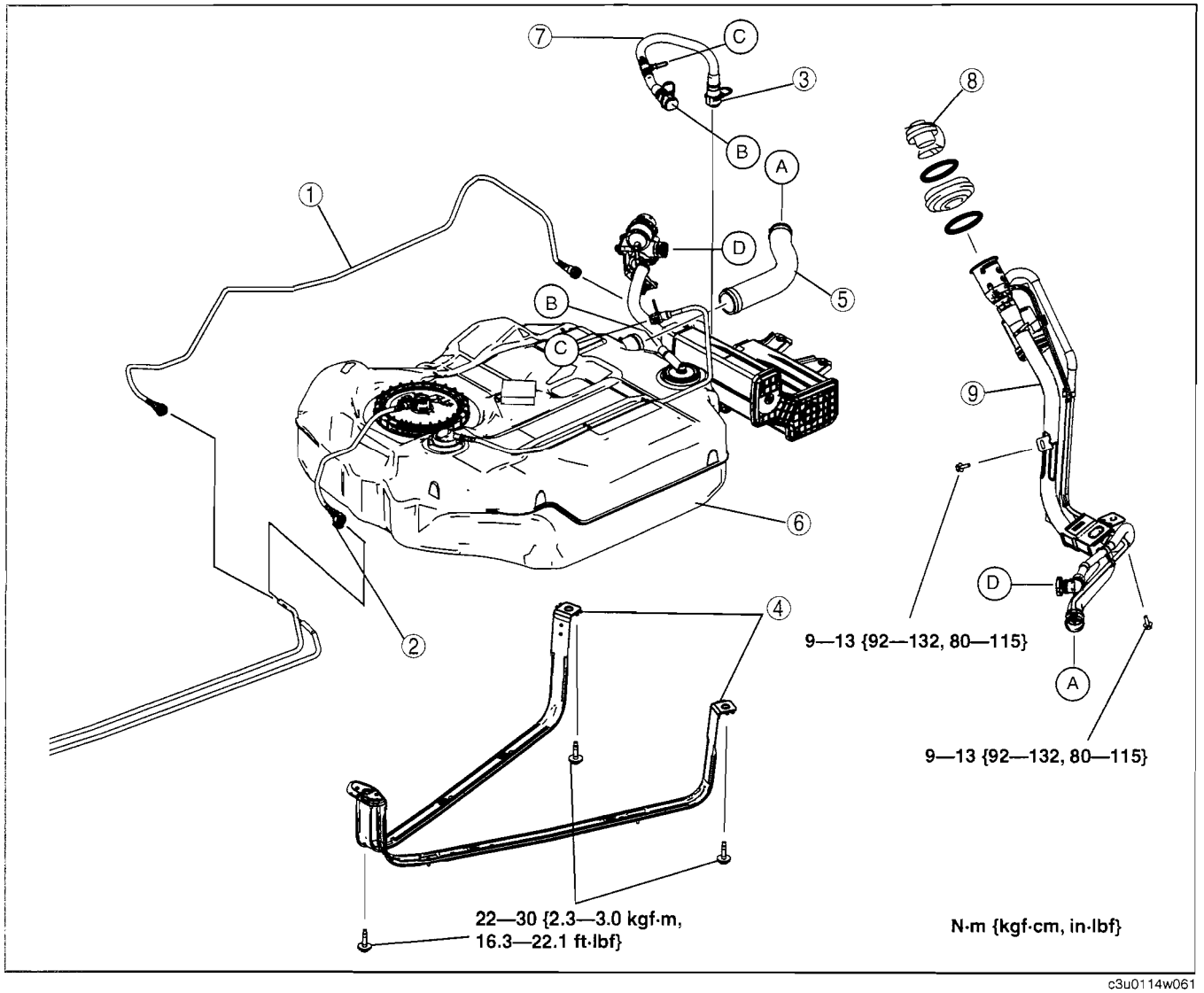
Using M-MDS

1. Stop the fuel pump using the "FP" simulation function.
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.

Without using M-MDS

1. Disconnect the negative battery cable to stop the fuel pump.

4. Remove the rear seat cushion. (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
5. Remove the service hole cover.
6. Disconnect the fuel pump unit connector.
7. Remove the charcoal canister protector. (See 01-16B-6 CHARCOAL CANISTER REMOVAL/INSTALLATION[L3 WITH TC].)
8. Lower the main silencer so that the insulator can be removed. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
9. Remove the insulator.
10. Remove the rear under cover (LH).
11. Remove in the order indicated in the table.
12. Install in the reverse order of removal.
13. Inspect all parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)



c3u0114w061

1	Evaporative hose (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
2	Quick release connector (on fuel line) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)

3	Quick release connector (on charcoal canister) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC],.)
4	Strap
5	Joint hose (See 01-14B-10 Joint Hose Removal Note.) (See 01-14B-10 Joint Hose Installation Note.)
6	Fuel tank
7	Breather hose (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
8	Fuel-filler cap
9	Fuel-filler pipe (See 01-14B-10 Fuel-filler Pipe Removal Note.)

Joint Hose Removal Note

1. Remove the fuel-filler pipe installation bolt.
2. Loosen the tie band connecting with the fuel tank.
3. Pull down the fuel-filler pipe to disconnect the joint hose.

Fuel-filler Pipe Removal Note

1. Remove the rear tire (RH).
2. Remove the rear mudguard (RH).
3. Support the rear crossmember using a transmission jack.
4. Remove the rear shock absorber (RH) lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
5. Removal the three rear crossmember installation bolts (RH). (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
6. Loosen the three rear crossmember installation bolts (LH) **about 10 mm {0.39 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
7. Lower the rear crossmember **about 35—40 mm {1.4—1.5 in}** using a transmission jack.

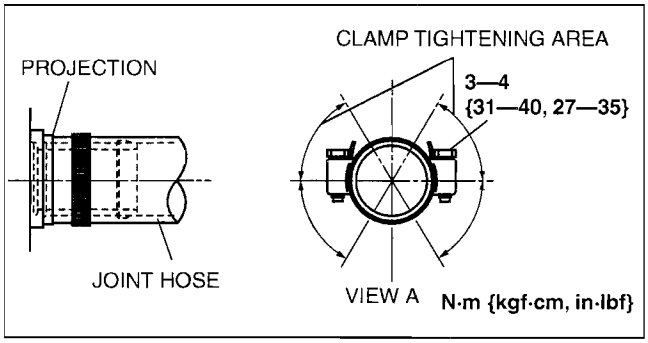
Note

- Because the rear crossmember is equipped with the positioning pins, rear wheel alignment inspection/adjustment is not necessary.

8. Remove the fuel-filler pipe.

Joint Hose Installation Note

1. Install the joint hose and clamp as shown in the figure.



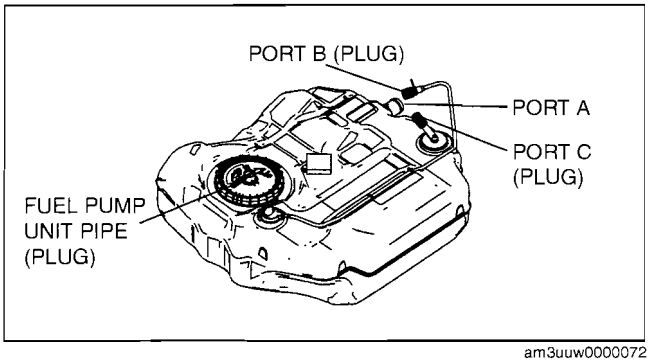
am3uuw0000013

FUEL TANK INSPECTION[L3 WITH TC]

id011439803200

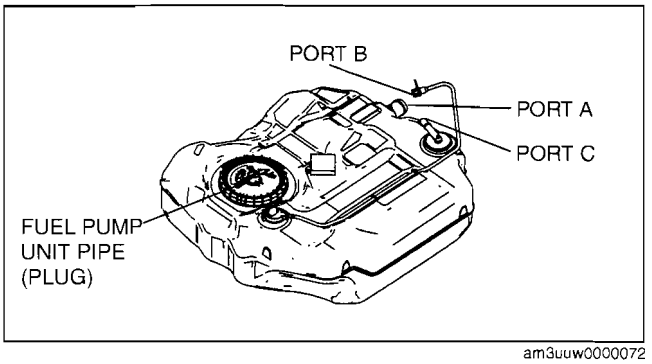
Note
- This inspection is for fuel shut-off valve and rollover valve integrated in the fuel tank.

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Remove the fuel tank. (See 01-14B-8 FUEL TANK REMOVAL/INSTALLATION[L3 WITH TC].)
5. Level the fuel tank.
6. Perform the following procedure to verify the fuel tank airtightness.
   (1) Plug the fuel pump unit pipe, ports B and C.
   (2) Apply a pressure to port A and wait for a while.
   (3) Verify that there is no air leakage from the fuel tank.
      - If there is airflow, replace the fuel tank.



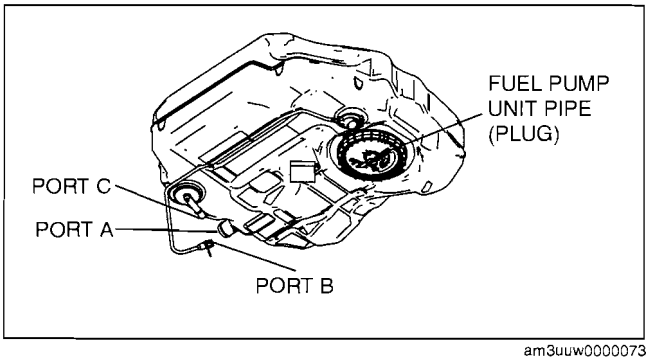
am3uuw0000072

7. Apply a pressure to port A and wait for a while.
8. With the pressure still applied, verify that there is airflow from port B and C.
   - If there is no airflow from either port, replace the fuel tank.
9. Place the fuel tank upside down.



am3uuw0000072

10. Apply a pressure to port A and wait for a while.
11. With the pressure still applied, verify that there is no airflow from port B and C.
    - If there is airflow from either port, replace the fuel tank.

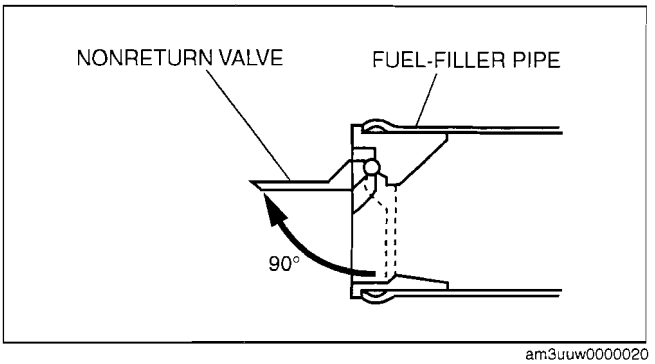


am3uuw0000073

NONRETURN VALVE INSPECTION[L3 WITH TC]

id011439803600

1. Remove the fuel-filler pipe. (See 01-14B-8 FUEL TANK REMOVAL/INSTALLATION[L3 WITH TC].)
2. Move the valve and verify that the valve opens to **90°**.
   - If it does not open, replace the fuel-filler pipe.
3. Verify that the nonreturn valve returns to the normal position by spring force.
   - If it does not return, replace the fuel-filler pipe.



am3uuw0000020

FUEL PUMP UNIT REMOVAL/INSTALLATION[L3 WITH TC]

id011439800900

Warning

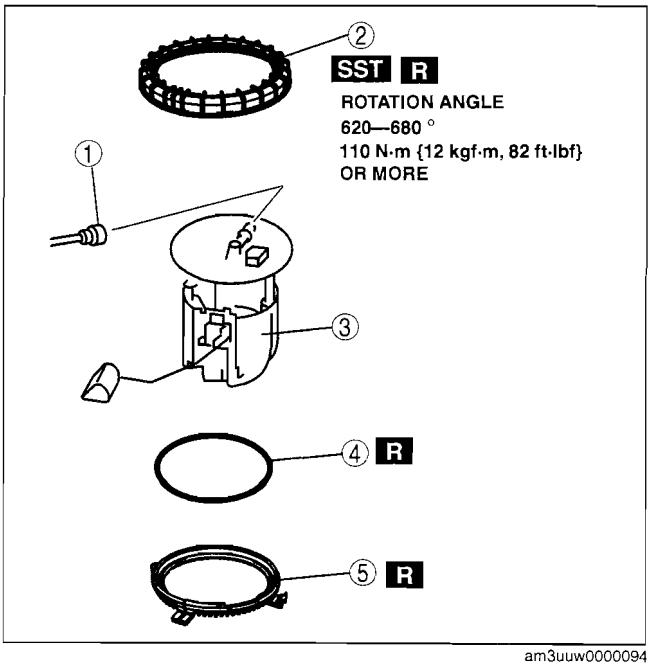
- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to "BEFORE SERVICE PRECAUTION".**
- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".**

Note

- Gasket must be replaced anytime fuel pump is removed or replaced.

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Remove the fuel tank. (See 01-14B-8 FUEL TANK REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

1	Quick release connector (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
2	Fuel pump cap (See 01-14B-13 Fuel pump cap removal note.) (See 01-14B-13 Fuel pump cap installation note.)
3	Fuel pump unit (See 01-14B-13 Fuel pump cap removal note.)
4	Packing (See 01-14B-13 Fuel pump cap installation note.)
5	Retainer (See 01-14B-13 Fuel pump cap installation note.)

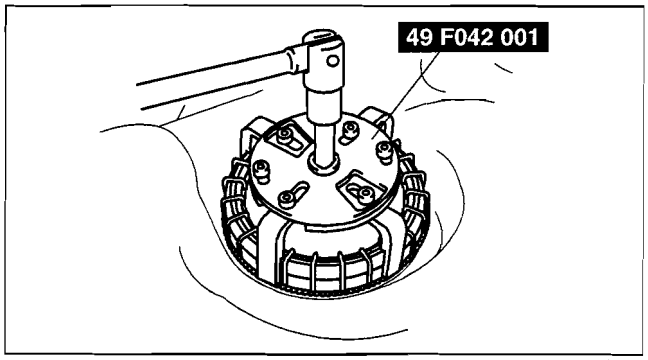


am3uuw0000094

Fuel pump cap removal note

Caution
- **The fuel pump cap could be damaged if the SST is used with any gap between the cap and the SST. Securely attach the SST so that there is no gap between the SST tabs and the side of the cap.**

1. Remove the fuel pump cap using the **SST**.



c3u114zl5004

Fuel pump cap installation note

Warning
- **Make sure there is no foreign material on each of the parts. If there is foreign material on the parts, the fuel pump unit cannot be assembled correctly, which could result in fuel leakage.**

Note
- The fuel pump unit will rotate and cannot be secured in the specified position if there is any gasoline on the gasket. Thoroughly wipe away all gasoline from the gasket.

1. Replace the packing, fuel pump cap and the retainer with new parts.

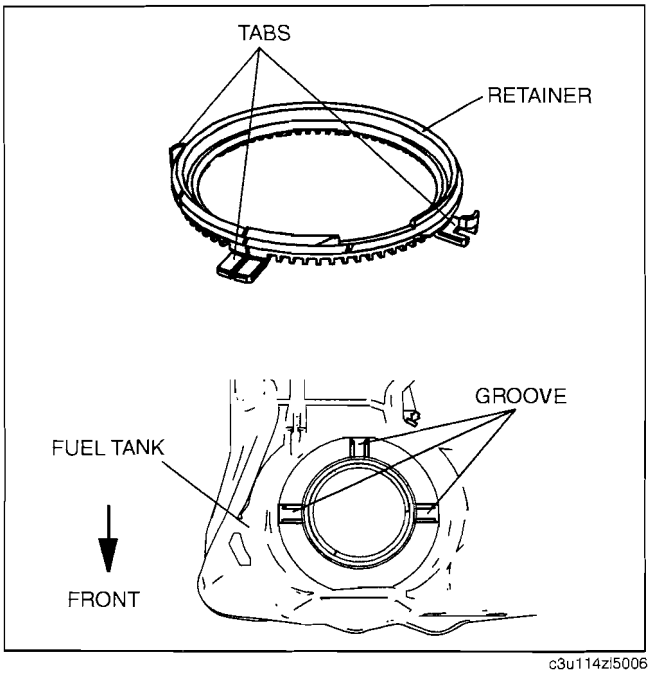
Caution
- **New parts can deform depending on the temperature. If the parts deform, the fuel pump unit cannot be assembled correctly, which could result in fuel leakage. Therefore, keep new parts at room temperature for the specified period of time to stabilize the shape.**

2. Leave new parts inside for the following period of time:

Stand-by time
12 h or more

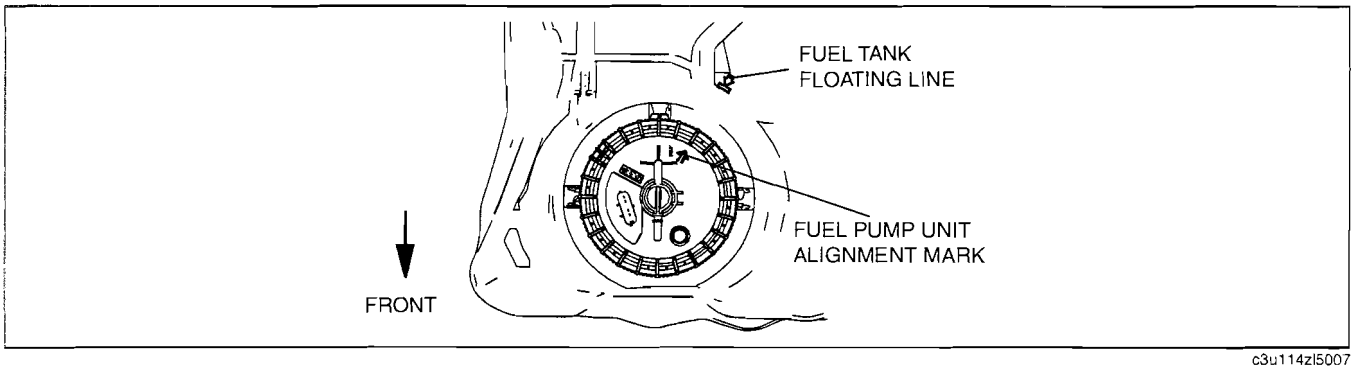
3. Install a new retainer to the fuel tank.
   (1) Align the retainer tabs (3 locations) with the fuel tank grooves.
   (2) Verify that the tabs are inserted into the grooves and the retainer is installed correctly.
   (3) Verify the retainer is not damaged.
4. Install a new packing to the fuel tank.
   (1) Verify the packing groove is clean and free of foreign material.
   (2) Install the packing to the fuel tank so that it is inserted into the fuel tank grooves.

Caution
- **Install the fuel pump unit to the fuel tank being careful not to bend the fuel sender unit arm. If the arm is bent, the fuel sender unit will not operate correctly.**



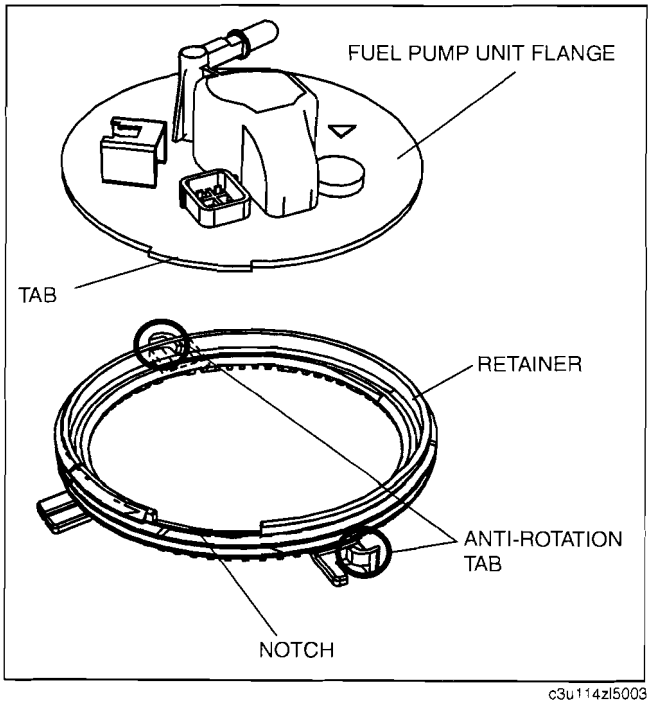
c3u114zl5006

5. Install the fuel pump unit to the fuel tank.
   (1) Align the fuel pump unit alignment mark and the floating line on the fuel tank.



c3u114zl5007

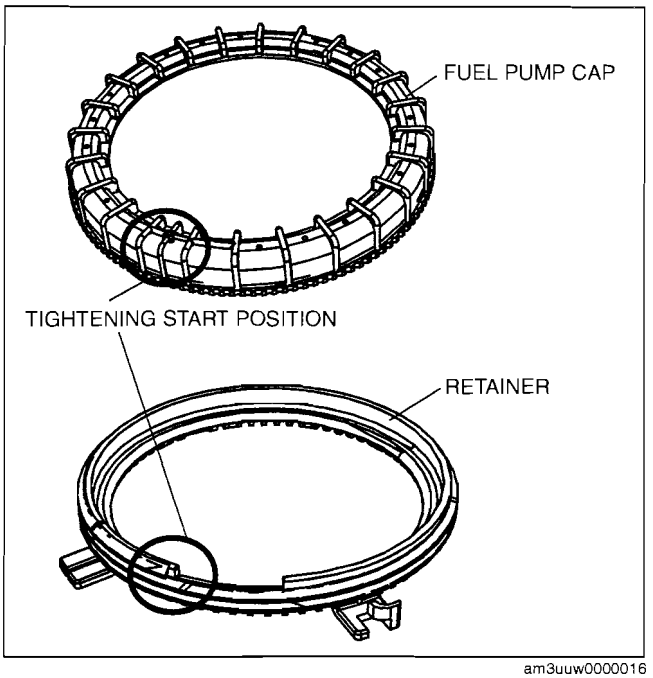
   (2) Verify the tab on the fuel pump unit flange with the notch on the retainer.



c3u114zl5003

6. Set on a new fuel pump cap.
   (1) Apply downward force (push down) on the center of the fuel pump unit flange.

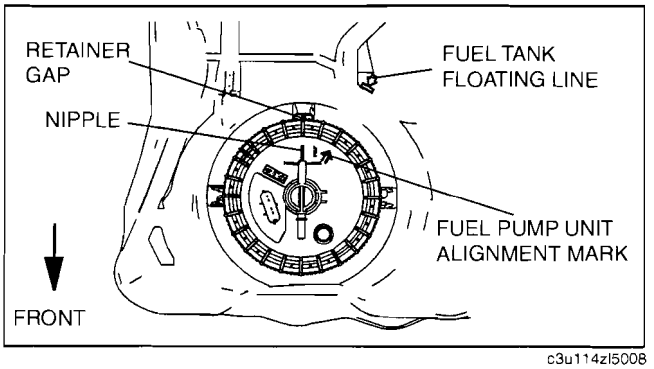
Note
- Align the fuel pump cap with the tightening start position of the retainer and tighten the fuel pump cap with the start position as **0** °.
- The fuel pump cap tightening start position is the position where the spaces between the ribs become narrow. The retainer tightening start position is the notch position.



am3uuw0000016

   (2) Align the tightening start position on the fuel pump cap and the tightening start point of the retainer.

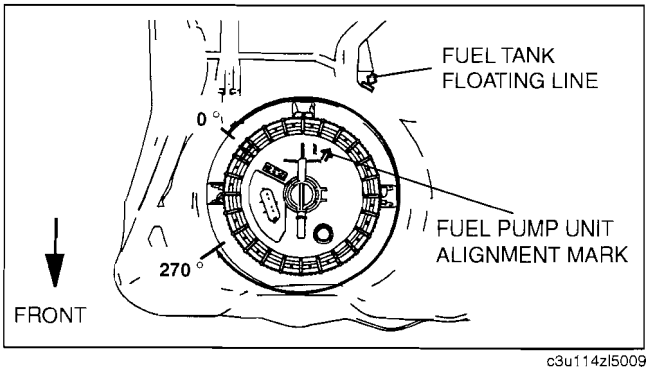
Warning
- **No grease or lubrication allowed on parts during installation. Parts could slide or they cannot be tightened to the specified torque. As a result, fuel leakage could occur.**
- **When tightening the fuel pump cap, be careful that the points indicated below have not deviated. If there is deviation, the fuel pump unit cannot be installed correctly, which could result in fuel leakage.**
  - **— The fuel pump unit alignment mark and the floating line on the fuel tank**
  - **— The fuel pump unit nipple and the retainer gap**



c3u114zl5008

7. Tighten the fuel pump cap.
   (1) Tighten the fuel pump cap by hand to the specified angle or more until the flange is fixed.

Fuel pump cap rotation angle
270 ° or more

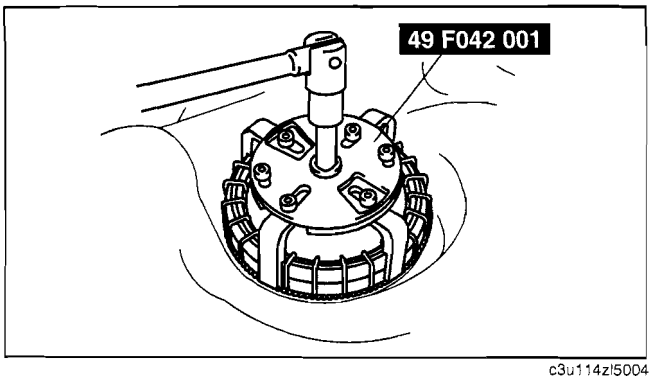


c3u114zl5009

   (2) Verify that the fuel pump cap is tightened correctly.
      1) The gap between the bottom of the fuel pump cap and the tank surface is even all around.
         - If the fuel pump cap is not tightened uniformly, loosen it by hand and re-install it.

(3) Install the **SST**.

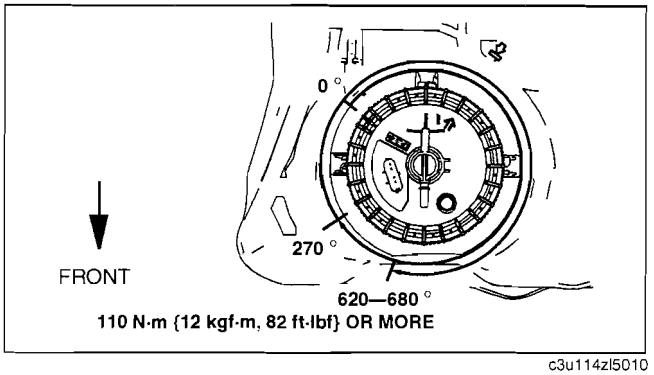
Note
- The fuel pump cap rotation angle is the angle from the **0** ° position. The angle tightened to using the **SST** includes the angle tightened by hand.



c3u114zl5004

(4) Tighten the fuel pump cap to the specified torque and to the specified angle or more.

Fuel pump cap rotation angle
620—680 °
Fuel pump cap tightening torque
110 N·m {12 kgf·m, 82 ft·lbf} or more



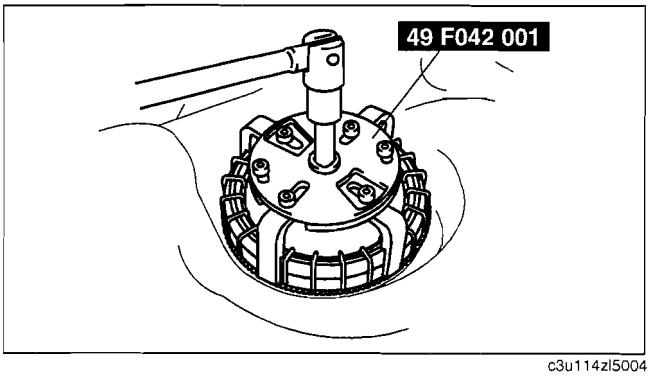
c3u114zl5010

(5) Verify that the fuel pump cap is tightened correctly.
1) The gap between the top of the fuel pump unit flange and the fuel pump cap is even all around.
- If it is not tightened uniformly, re-install it using the following procedure.

2) The gap between the fuel pump unit and fuel tank is even all around.
- If it is not tightened uniformly, re-install it using the following procedure.

3) Verify that the fuel pump unit alignment mark and the floating line on the fuel tank are aligned.
- If they are not aligned, re-install it using the following procedure.

4) Verify that the fuel pump unit nipple and the retainer gap are aligned.
- If it is not aligned, re-install using the following procedure.
  1. Install the **SST**.
  2. Remove the fuel pump cap, fuel pump unit, packing, and retainer.
  3. Verify that the retainer is not damaged.
     - If both of the retainer anti-rotation tabs are broken, replace it with new one.
  4. Return to Step 2 and re-install.



c3u114zl5004

FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY[L3 WITH TC]

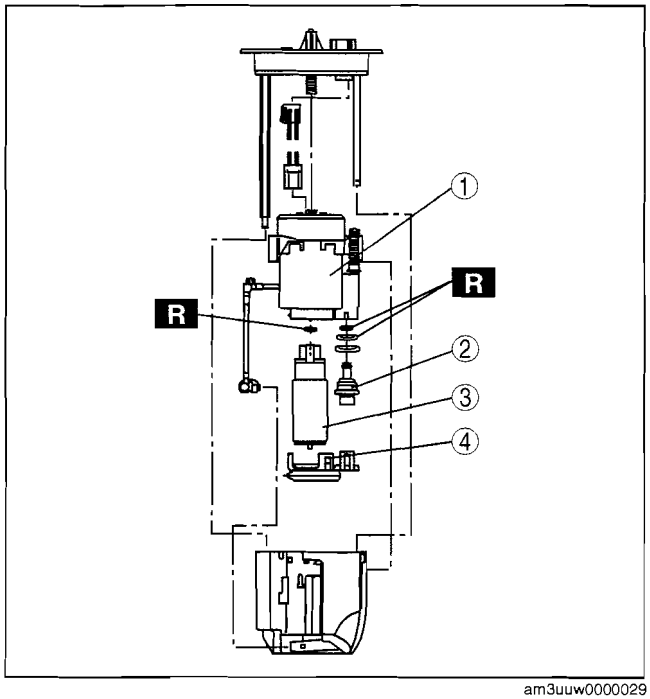
id011439801000

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

1	Fuel filter body
2	Fuel pressure regulator
3	Fuel pump
4	Filter



am3uuw0000029

FUEL PUMP UNIT INSPECTION[L3 WITH TC]

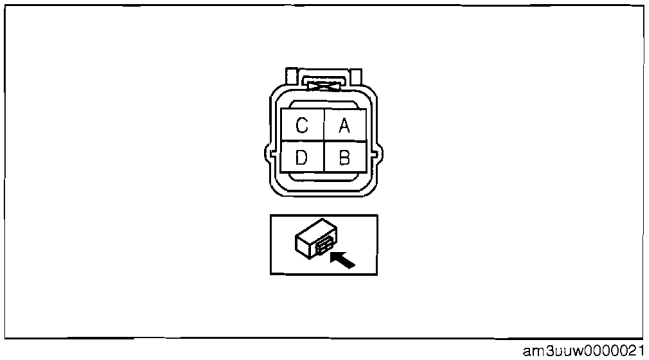
id011439801100

Continuity Inspection

Note

- Perform the following test only when directed.

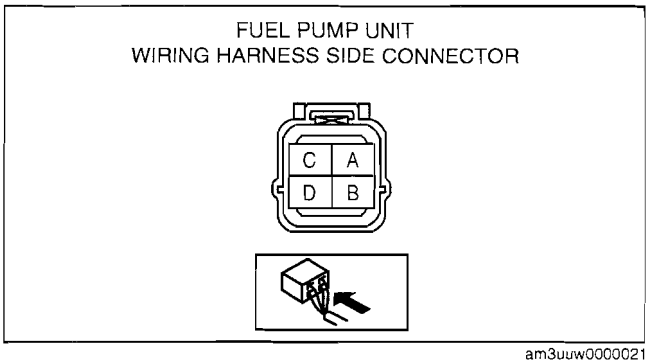
1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Disconnect the fuel pump unit connector.
4. Inspect for continuity between fuel pump unit connector terminals B and D.
   - If there is no continuity, replace the fuel pump body.
   - If as specified, carry out the "Circuit Open/ Short Inspection".



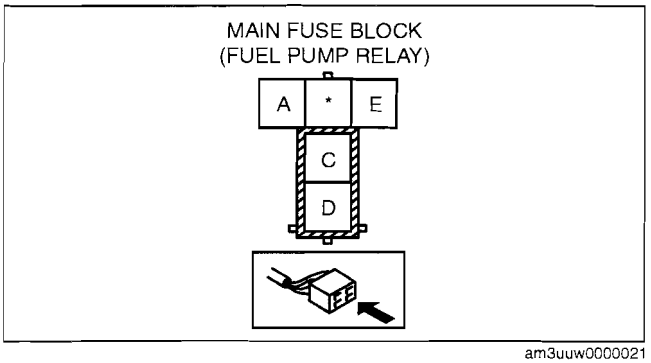
am3uuw0000021

Circuit Open/Short Inspection

1. Inspect the following wiring harnesses as for open or short circuit (continuity check).



am3uuw0000021



am3uuw0000021

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Fuel pump unit terminal B and fuel pump relay terminal A
  - — Fuel pump unit terminal D and body ground

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Fuel pump unit terminal B and power supply
  - — Fuel pump unit terminal B and body ground
  - — Fuel pump unit terminal D and power supply

Fuel Pump Hold Pressure Inspection

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

Caution

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

Note

- Perform the following test only when directed.

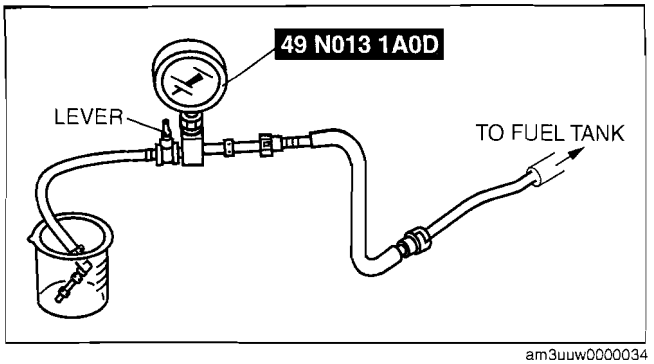
1. Complete the "BEFORE SERVICE PRECAUTION". (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Remove the battery and battery tray. (See01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

Caution

- **The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.**

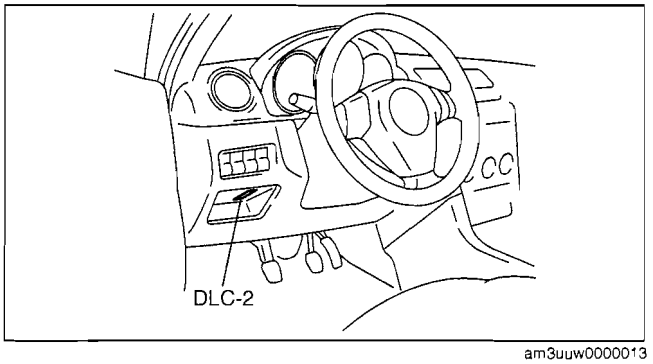
5. Disconnect the quick release connector from the fuel tank. (See01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)

6. Turn the lever **90°** against the hose of the **SST** to plug the **SST** outlet.
7. Push the **SST** quick release connector into the fuel pipe until a click is heard.
8. Set the fuel hose into a container to avoid fuel spills.



am3uuw0000034

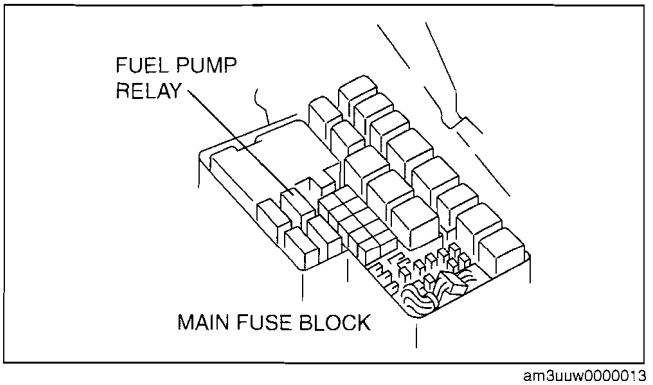
9. Start the fuel pump using the following procedure:
   Using M-MDS
   1. Connect the M-MDS to the DLC-2.
   2. Start the fuel pump using the "FP" simulation function.



am3uuw0000013

   Without using M-MDS
   1. Disconnect the negative battery cable.
   2. Remove the fuel pump relay.

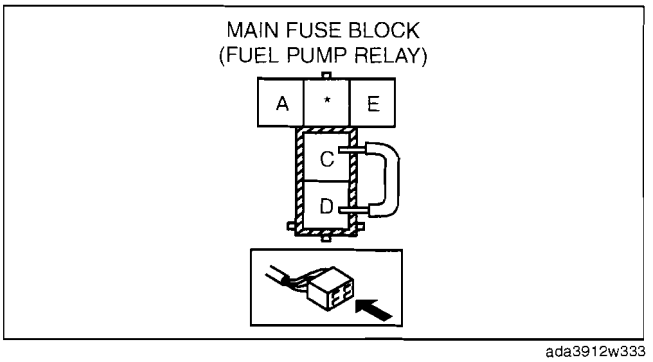
   Caution
   - **Be careful to short the specified terminal as shorting the wrong terminal of the main fuse block may cause a malfunction.**



am3uuw0000013

   3. Using a jumper wire, short fuel pump relay terminals C and D and connect the negative battery cable to start the fuel pump.

   Caution
   - **The fuel pump may malfunction if it is operated without any fuel in the fuel tank (fuel pump idling). Constantly monitor the amount of fuel being discharged and immediately stop operation of the pump when essentially no fuel is being discharged.**



ada3912w333

10. Turn the ignition switch to the LOCK position.
11. Measure the fuel pump hold pressure **after 5 min**.
    - If not as specified, replace the fuel pump after inspecting the following:
      — Fuel line for clogging or leakage

Fuel pump hold pressure

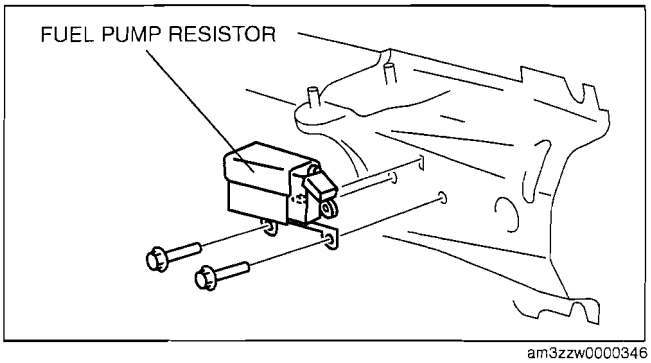
More than 230 kPa {2.3 kgf/cm^2, 33 psi}

12. Disconnect the jumper wire.
13. Disconnect the **SST**.
14. Connect the quick release connector. (See01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
15. Inspect all parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

FUEL PUMP RESISTOR REMOVAL/INSTALLATION[L3 WITH TC]

id011439801200

1. Remove the battery cover. (See01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the air cleaner. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Disconnect the fuel pump resistor connector.
5. Remove in the fuel pump resistor.

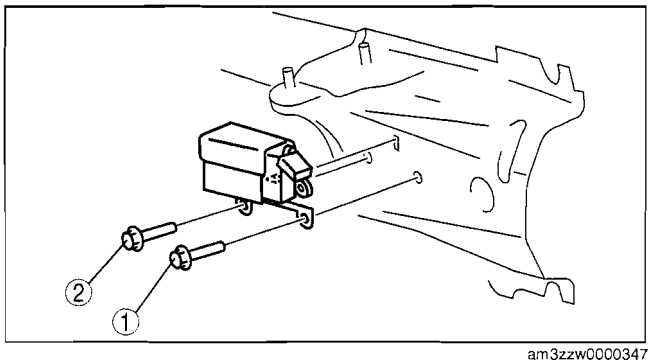


am3zzw0000346

6. Install in the order as shown in the figure.

Tightening torque
7.8—11.8 N·m {80—120 kgf·cm, 70—104 in·lbf}

7. Connect the fuel pump resistor connector.



am3zzw0000347

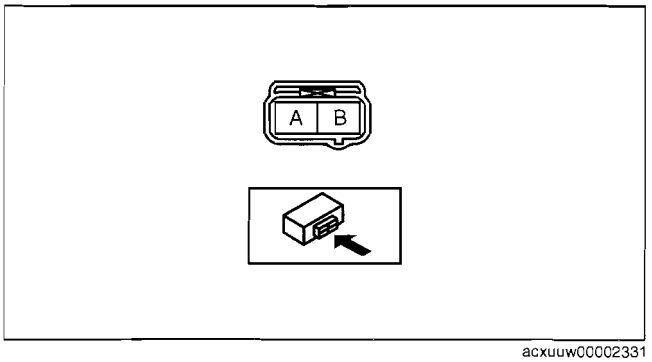
FUEL PUMP RESISTOR INSPECTION[L3 WITH TC]

id011439801300

Resistance Inspection

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the fuel pump resister. (See 01-14B-20 FUEL PUMP RESISTOR REMOVAL/INSTALLATION[L3 WITH TC].)
4. Verify that the continuity between the fuel pump resister terminal A and B is within the specification.
   - If not within the specification, replace the fuel resistor.

Fuel pump resistor continuity
0.304—0.336 ohms (20 °C {68 °F})



acxuuw00002331

HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC]

id011439801400

Caution

- **Do not disassemble the high pressure fuel pump.**
- **Do not scratch or damage the fuel sealing surface of the high and low fuel ports.**
- **When removing the high pressure fuel pipe, secure the joint (pump side) so that it dose not rotate, and loosen the screw (pipe side).**

Note

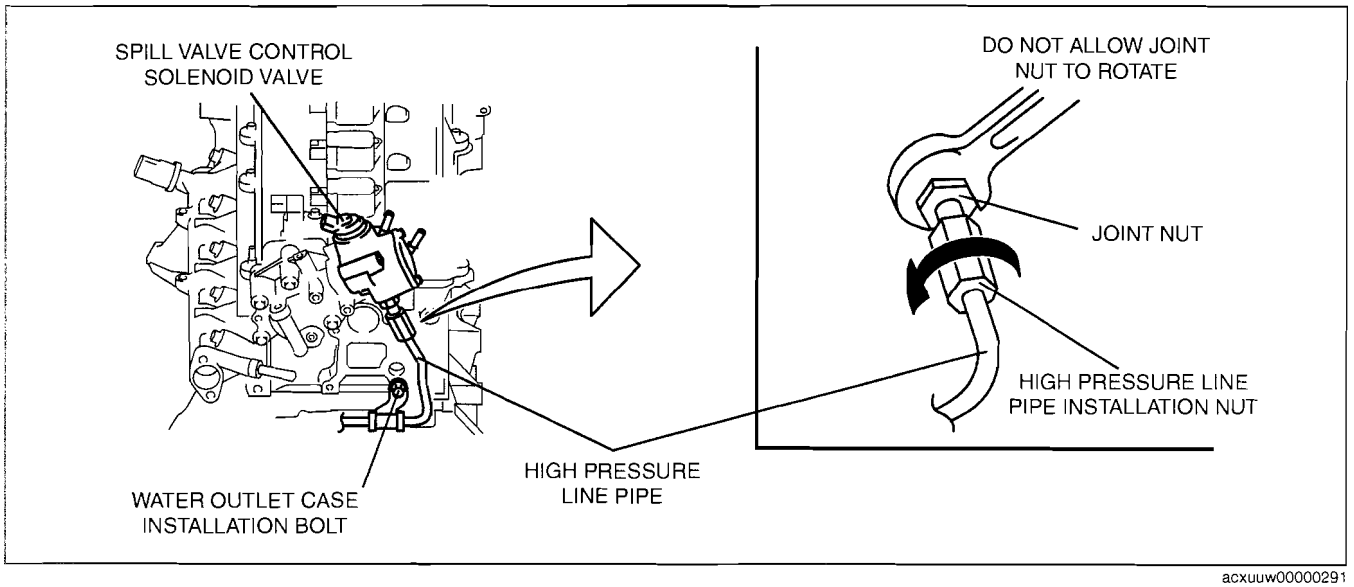
- If the high pressure fuel pump is removed, replace the O-ring with a new one.

1. Complete the "BEFORE SERVICE PRECAUTION". (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
5. Disconnect the spill valve control solenoid valve connector.
6. Disconnect the quick release connector on the high pressure fuel pump. (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
8. Remove the air duct. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])

Warning

- **If the high pressure fuel pump joint nut is loosened, fuel leakage may occur resulting in death or serious injury, or damage to the equipment or the vehicle. Fuel can also irritate the skin and eyes. When removing the high pressure line pipe, always tighten the high pressure line pipe installation nut while fixing the high pressure fuel pump joint nut with a wrench. If the high pressure fuel pump joint nut has rotated, replace the high pressure fuel pump with a new one.**

9. Disconnect the high pressure line pipe of the high pressure fuel pump.

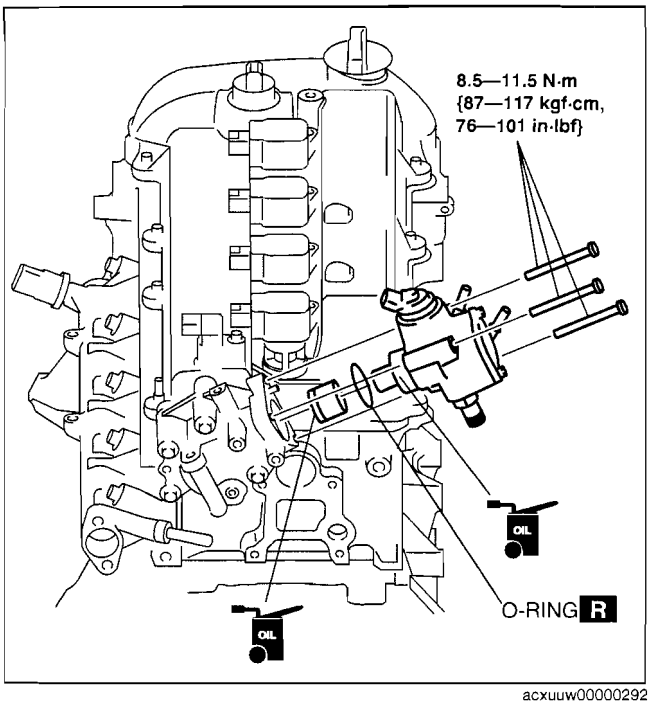


acxuuw00000291

(1) Fix the joint nut with a wrench on the high pressure fuel pump side as shown in the figure.
(2) Loosen the high pressure line pipe installation nut.

10. Drain engine coolant. (See01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
11. Loosen the water outlet case installation bolts securing the high pressure line pipe.

12. Remove the high pressure fuel pump.

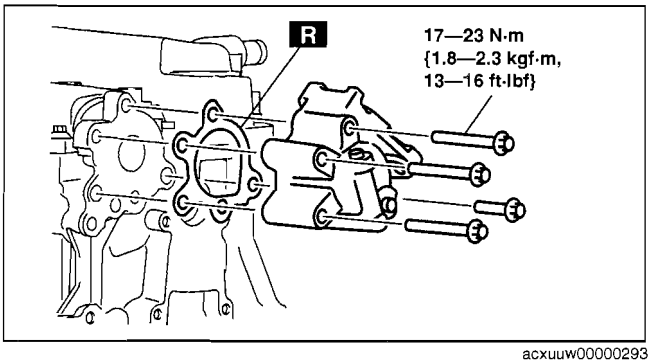


acxuuw00000292

13. Remove the high pressure fuel pump cover.
14. Tighten the bolts on the high pressure fuel pump cover.

Tightening torque
17—23 N·m {1.8—2.3 kgf·m, 13—16 ft·lbf}

Caution
- **If the high pressure fuel pump installation bolts are tightened with the high pressure fuel pump tilted, the high pressure fuel pump may not operate correctly. Tighten the high pressure fuel pump installation bolts in a few passes with equal torque.**



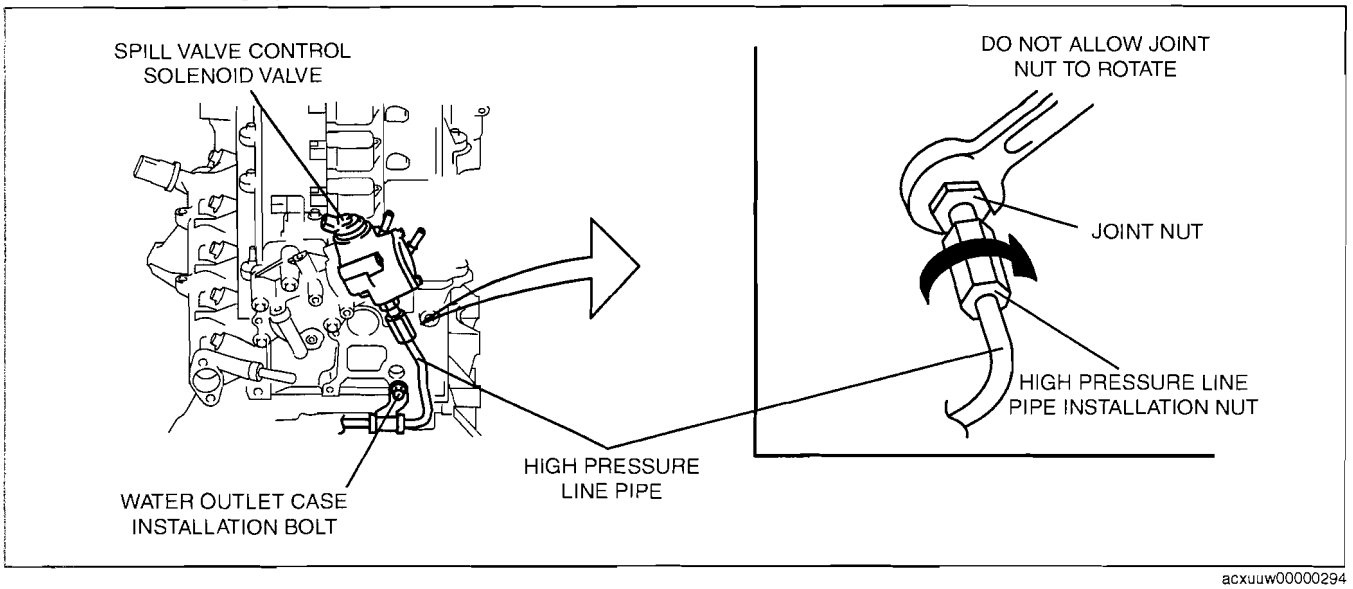
acxuuw00000293

15. Tighten the bolts on the high pressure fuel pump.

Tightening torque
8.5—11.5 N·m {87—117 kgf·cm, 76—101 in·lbf}

Warning
- **If the high pressure fuel pump joint nut is loosened, fuel leakage may occur resulting in death or serious injury, or damage to the equipment or the vehicle. Fuel can also irritate the skin and eyes. When installing the high pressure line pipe, always tighten the high pressure line pipe installation nut while fixing the high pressure fuel pump joint nut with a wrench. If the high pressure fuel pump joint nut has rotated, replace the high pressure fuel pump with a new one.**

16. Assemble the high pressure line pipe.



acxuuw00000294

(1) Fix the joint nut with a wrench on the high pressure fuel pump side as shown in the figure.
(2) Tighten the high pressure line pipe installation nut.

Tightening torque
23.5—35.5 N·m {2.40—3.59 kgf·m, 17.4—26.0 ft·lbf}

17. Tighten the water outlet case installation bolts.

Tightening torque
8—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}

18. Install the quick release connector. (See01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/ INSTALLATION[L3 WITH TC].)

Fuel Leakage Inspection After High Pressure Fuel Pump Installation

1. Verify that the high pressure fuel pump is assembled securely.
2. Drive the vehicle starting from a standstill and brake suddenly **five to six times** at a low speed.
3. Stop the vehicle and verify from outside the vehicle that there is no fuel leakage around the high pressure fuel pump.

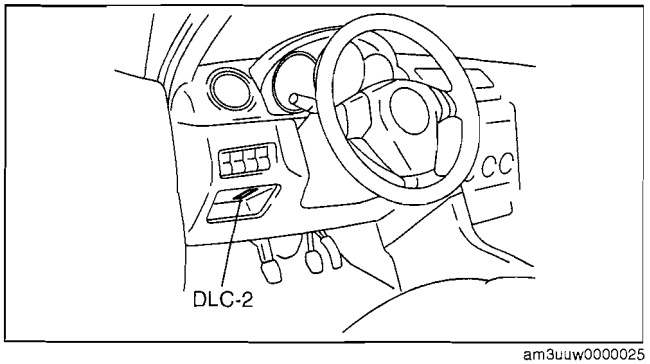
HIGH PRESSURE FUEL PUMP INSPECTION[L3 WITH TC]

id011439801500

Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the fuel pressure sensor.

1. Verify that the fuel pressure sensor is normal. (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)
2. Connect the M-MDS to the DLC-2.
3. Turn the ignition switch to the ON position (Engine off).
4. Select the FUEL_PRES, and LOAD, RPM PIDs on the M-MDS.

Caution
- **If the engine is run at a high speed, it could be damaged. When racing the engine, do not race it up to 6,700 rpm or more.**



am3uuw0000025

5. After the LOAD PID is **60% or more** while the engine is raced with the accelerator pedal fully depressed, verify that the FUEL_PRES PID is **approx. 11.5 Mpa**.
— If not as verified, replace the high pressure fuel pump.

QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC]

id011439801700

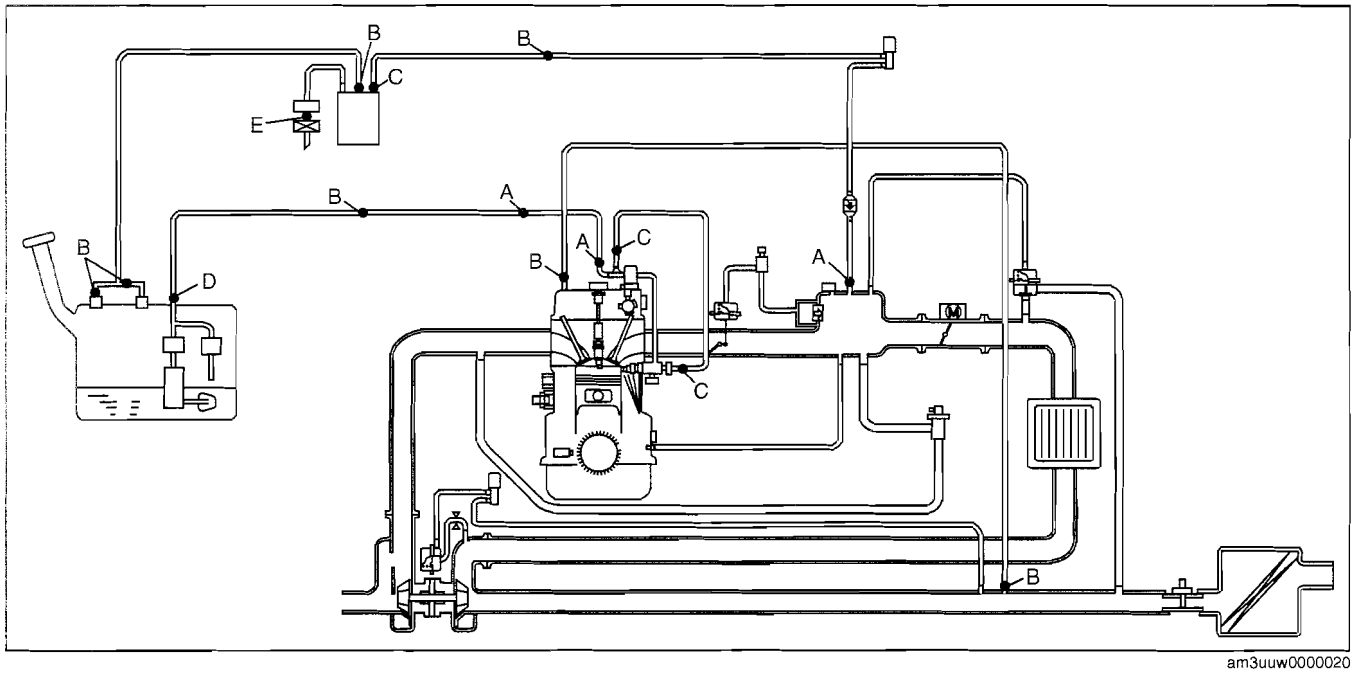
Warning

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION".**

Quick Release Connector Type

Caution

- **There are five types of quick release connectors. Verify the type and location, and install/remove properly.**



am3uuw0000020

Type A Removal

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)

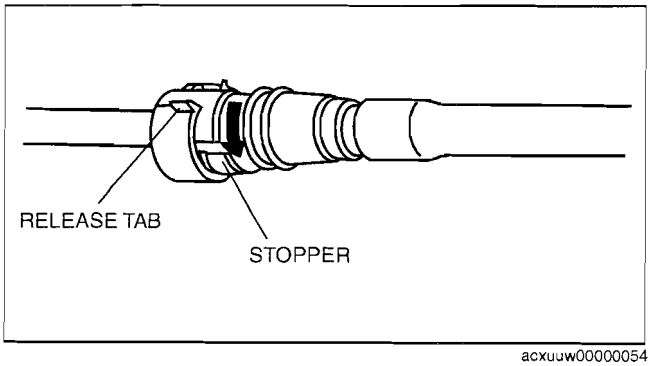
Caution

- **The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.**

Note

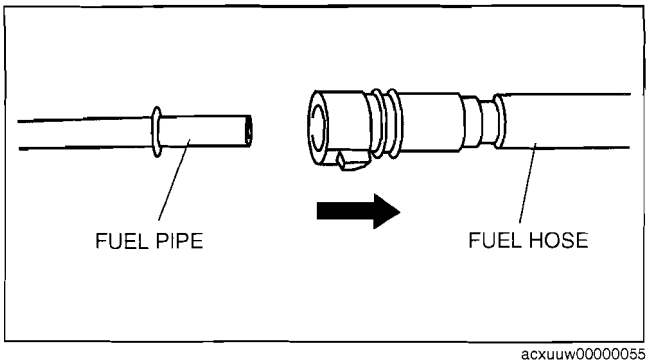
- The fuel hose can be removed by pushing it to the pipe side to release the lock.

2. Rotate the release tab on the quick release connector to the stopper position.



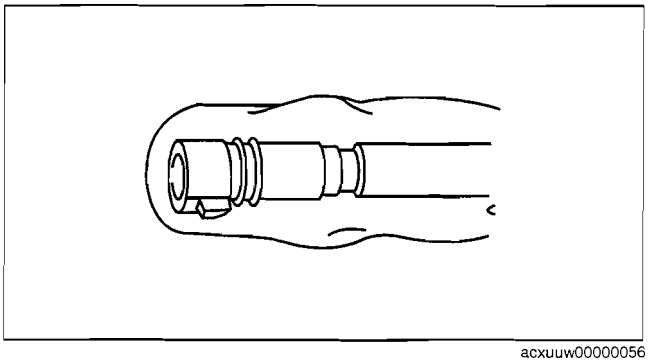
acxuuw00000054

3. Pull out the fuel hose straight from the fuel pipe and disconnect it.



acxuuw00000055

4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.



acxuuw00000056

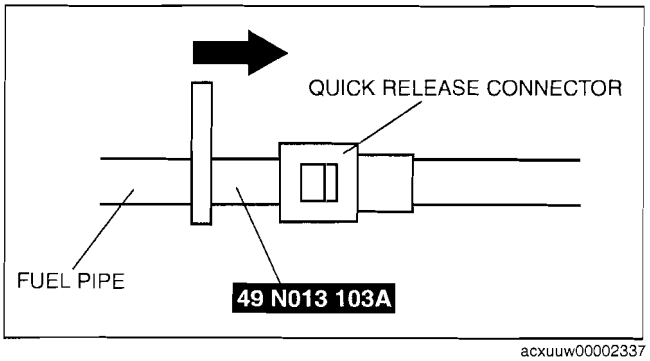
Type B Removal

Caution
- **Be careful not to damage the pipe when unlocking the retainer.**

Note
- When removing the quick connector, either SST 49 E042 001 or 49 N013 103A.

When using SST 49 N013 103A

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Insert the SST into the quick release connector.
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.



acxuuw00002337

When using SST 49 E042 001

Note
- If the quick release connector is removed, replace the retainer with a new one.

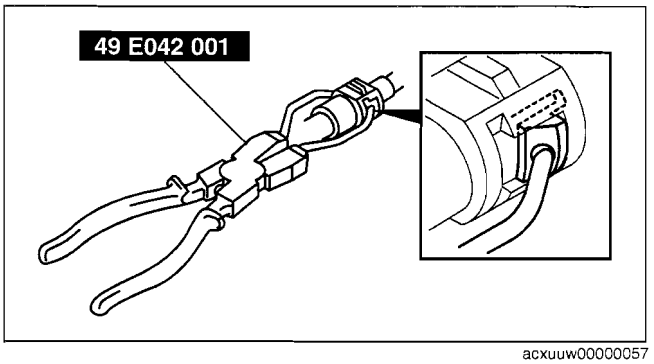
1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)

Note
- The retainer is attached to the pipe even after the connector is disconnected.

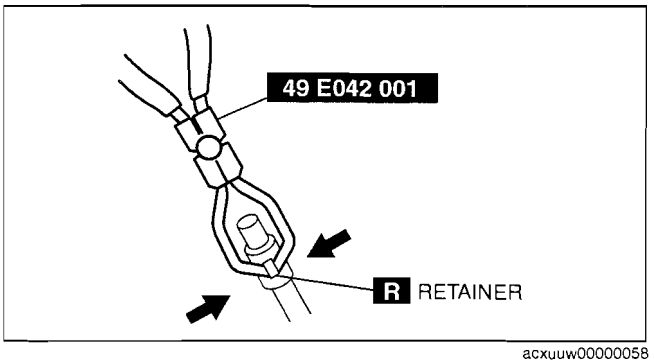
2. Set the **SST** parallel to the quick release connector.

Note
- The quick release connector can be removed by pushing the center of the retainer tabs.

3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.
4. Pull the connector side and disconnect the quick release connector.
5. Raise a retainer tab using the **SST** and remove the retainer.
6. Cover the disconnected quick release connector and evaporative hose with vinyl sheeting or a similar material to prevent it from scratches or dirt.



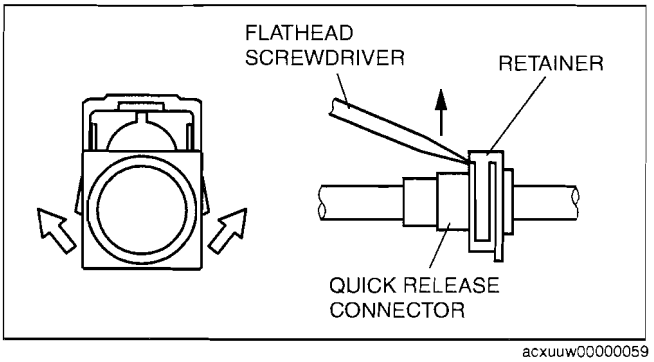
acxuuw00000057



acxuuw00000058

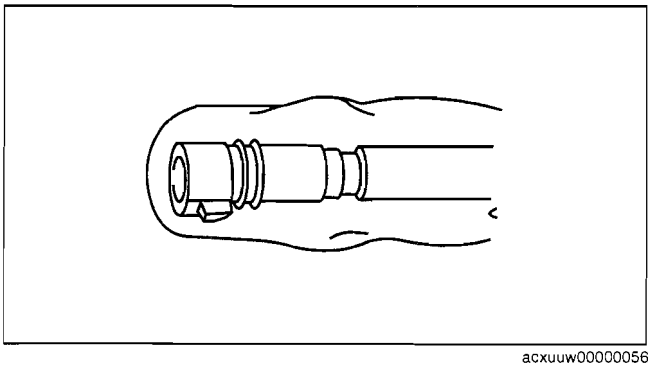
Type C Removal

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Move the retainer upward using a small flathead screwdriver or a similar tool.
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.



acxuuw00000059

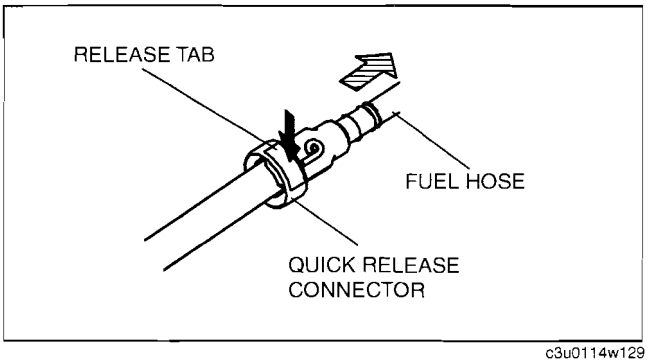
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.



acxuuw00000056

Type D Removal

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See 01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Push the release tab on the retainer to unlock.
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



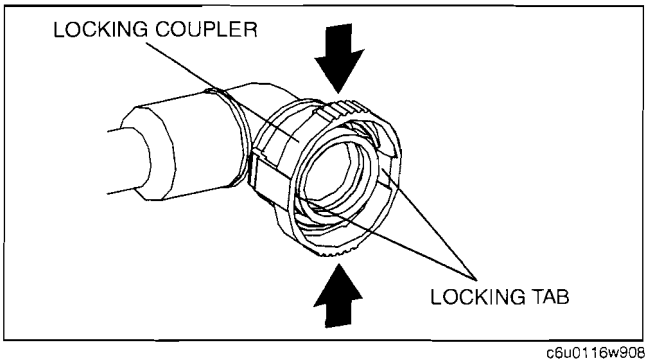
c3u0114w129

Type E Removal

1. Squeeze the locking coupler until the locking tab opens and releases.

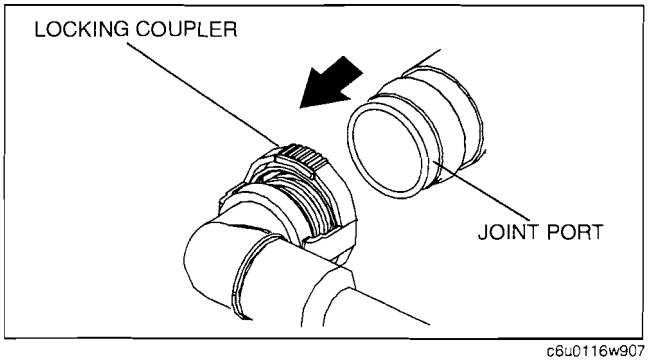
Note

- The locking coupler has two internal locking tabs which retain the joint port. Be sure that the squeezing place on the locking coupler is squeezed until it can be released from the joint port.



c6u0116w908

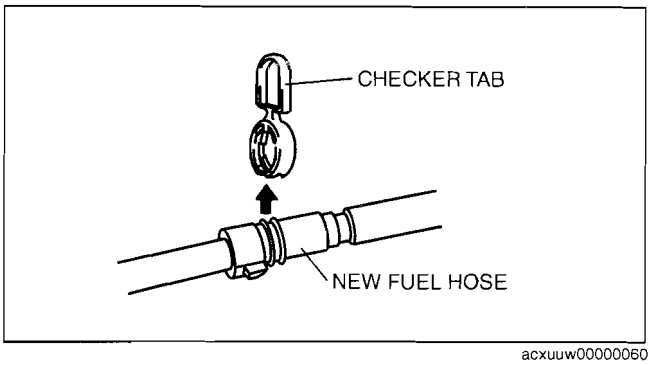
2. Pull the quick release connector straight outward.
3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



c6u0116w907

Type A Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



acxuuw00000060

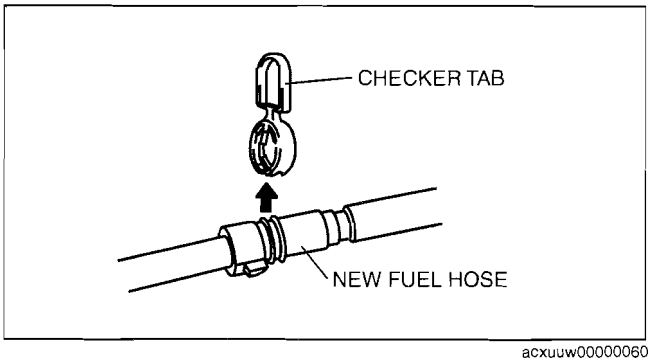
1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
3. Reconnect the fuel hose straight to the fuel pipe until a click is heard.

Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.
5. Inspect all related parts by performing"AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

Type B Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



acxuuw00000060

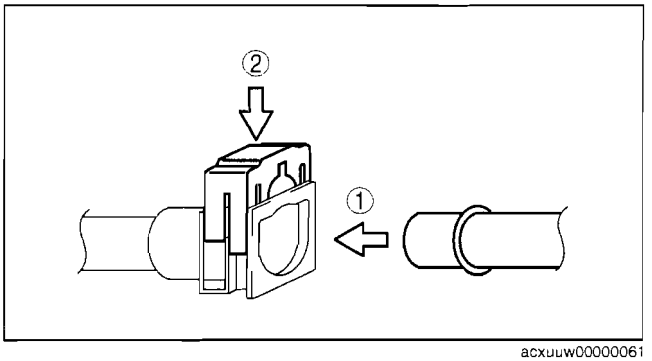
Caution
- **Be sure to replace the retainer with a new one to prevent gas leakage.**
- **To prevent evaporative gas leakage, be sure not to damage the connecting part between the charcoal canister and pipe, and the locks between the quick release connector and retainer. If any of them are damaged, replace the charcoal canister or hose with a new one.**

1. Remove the retainer remaining on the charcoal canister pipe.
2. Install a new retainer to the quick release connector.
3. Reconnect the hose straight to the pipe until a click is heard.
4. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
5. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

Type C Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.

1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Install the quick release connector.
   - Insert the fuel pipe straight to the end of the quick release connector.
   - Push down the retainer using a finger.
     - — If the retainer cannot be pushed down, push the fuel pipe further to the quick release connector.
3. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
4. Inspect all related parts by performing ""AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)



acxuuw00000061

Type D Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.

1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Reconnect the fuel hose straight to the fuel pipe until a click is heard.
3. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
4. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

Type E Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.

1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the joint port.
3. Reconnect the evaporative hose straight to the joint port until a click is heard.

Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC]

id011439800600

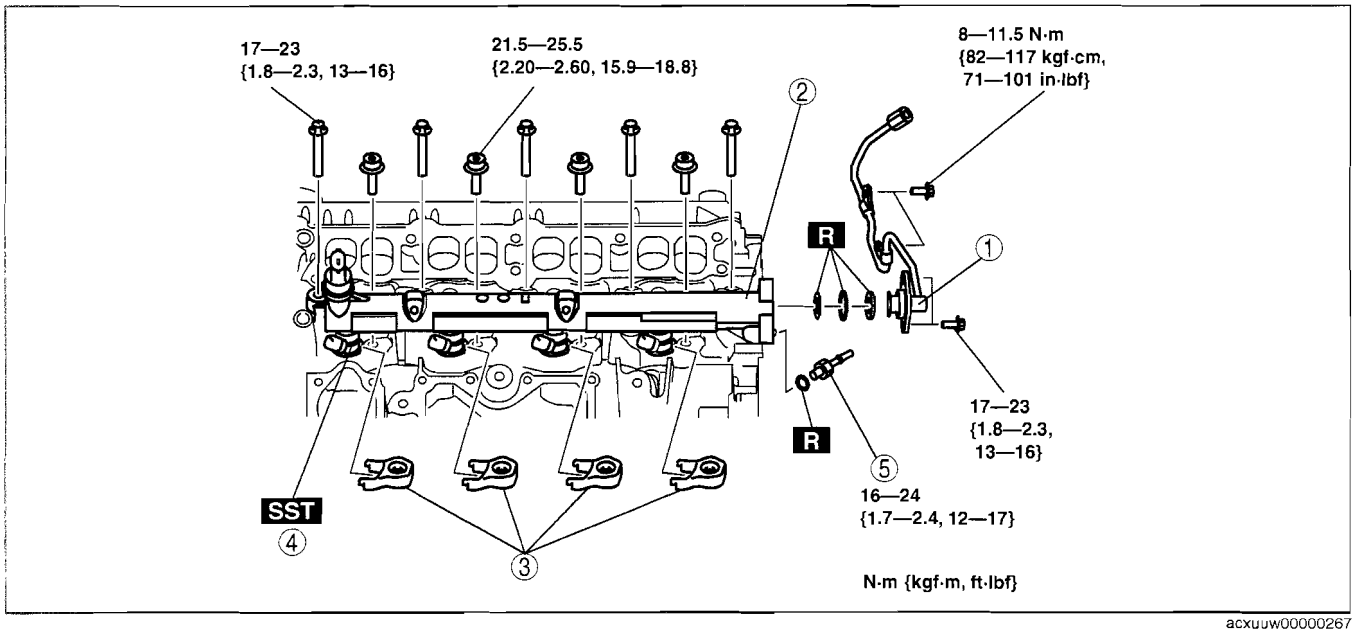
Caution

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

Note

- When the fuel pressure sensor replaces, replace a new fuel delivery pipe with a new fuel pressure sensor.(See 01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC])

1. Complete the "BEFORE SERVICE PRECAUTION". (See01-14B-4 BEFORE SERVICE PRECAUTION[L3 WITH TC].)
2. Disconnect the negative battery cable. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the intake manifold. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove in the order indicated in the table.



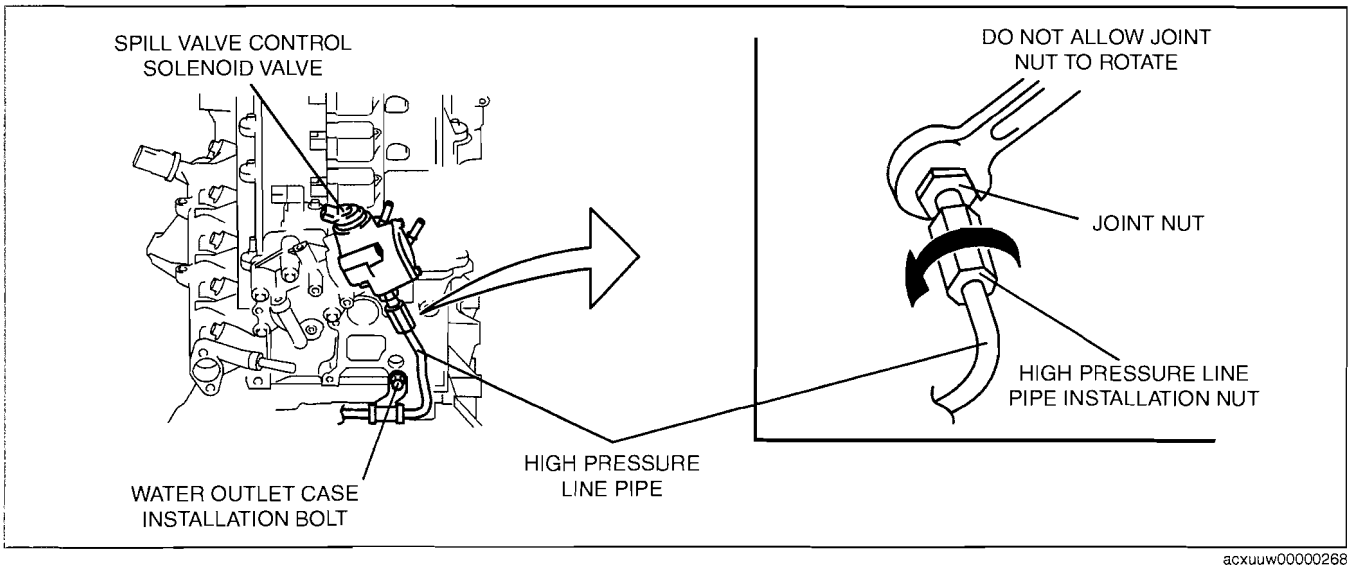
acxuuw00000267

1	High pressure line pipe (See01-14B-31 High Pressure Line Pipe Removal Note.) (See01-14B-32 High Pressure Line Pipe Installation Note.)
2	Fuel delivery pipe (See01-14B-32 Fuel Delivery Pipe Installation Note.)
3	Fuel injector bracket
4	Fuel injector (See01-14B-31 Fuel Injector Removal Note.)
5	Relief valve

5. Install in the reverse order of removal.
6. Inspect all parts by performing "AFTER SERVICE PRECAUTION". (See 01-14B-5 AFTER SERVICE PRECAUTION[L3 WITH TC].)

High Pressure Line Pipe Removal Note

1. Drain engine coolant. (See01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
2. Disconnect the high pressure line pipe of the high pressure fuel pump. (See01-14B-21 HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION[L3 WITH TC].)



acxuuw00000268

   (1) Fix the joint nut with a wrench on the high pressure fuel pump side as shown in the figure.
   (2) Loosen the high pressure line pipe installation nut.
3. Remove the high pressure line pipe.

Fuel Injector Removal Note

Note

- Depending on the driving conditions, carbon may accumulate on the inserted part of the fuel injector, causing the fuel injector to stick. Remove the fuel injector using the following procedure.

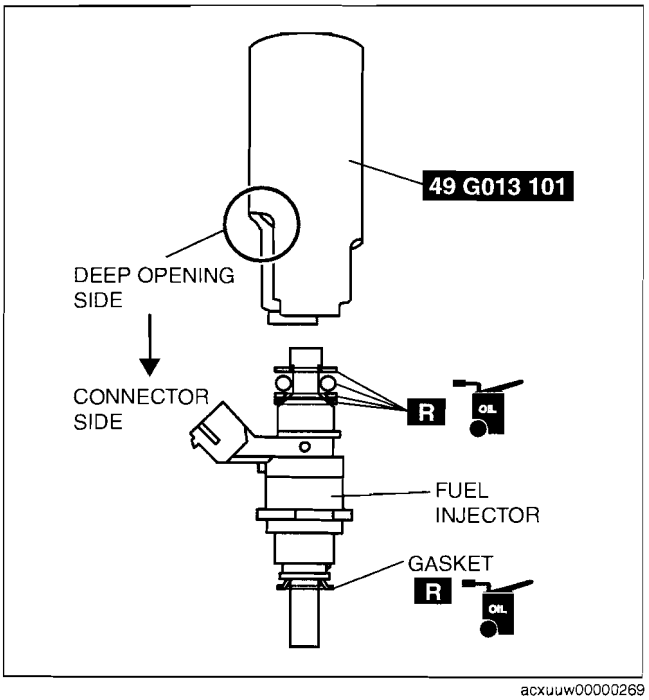
1. Install the **SST** to the fuel injector confirming that the **SST** faces the correct direction as shown in the figure.

Caution

- **If the SST slips while ratcheting up the fuel injector, the fuel injector or surrounding parts could be damaged. Press fit the SST to the fuel injector firmly and operate carefully.**
- **When ratcheting up the fuel injector, the fuel injector connector may contact the cylinder head and damage the fuel injector. Ratchet up the fuel injector so that the fuel injector connector does not contact the cylinder head.**

Note

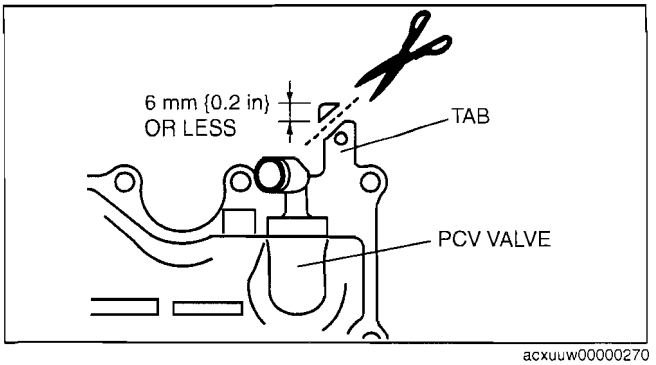
- If fuel injector No.3 contacts the oil separator, cut the tab on the oil separator as shown in the figure. Carefully cut the tab so that the oil separator is not deformed or damaged, with no clearance on the mating surfaces of the oil separator and engine.



acxuuw00000269

2. Keep ratcheting the **SST** so that the fuel injector becomes free enough to ratchet up without using the **SST**.

Caution
- **Do not apply excessive force to the fuel injector connector because the fuel injector could be damaged.**



acxuuw00000270

3. Pull out the fuel injector by ratcheting it upright.
4. Verify that there are no gasket in the cylinder heads after removing the fuel injectors.

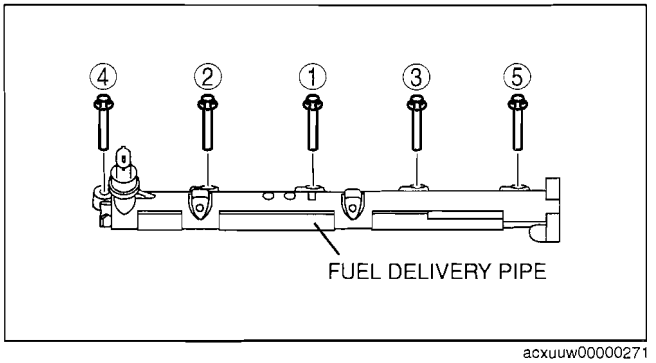
Warning
- **If foreign material such as metal shavings penetrates the fuel injector installation hole on the cylinder block, the engine could be damaged. Remove all foreign material and cap the fuel injector installation hole after removing the fuel injector.**

5. Clean the fuel injector and around the insertion hole using a vacuum cleaner.

Fuel Delivery Pipe Installation Note

1. Tighten the bolts in the order shown in the figure.

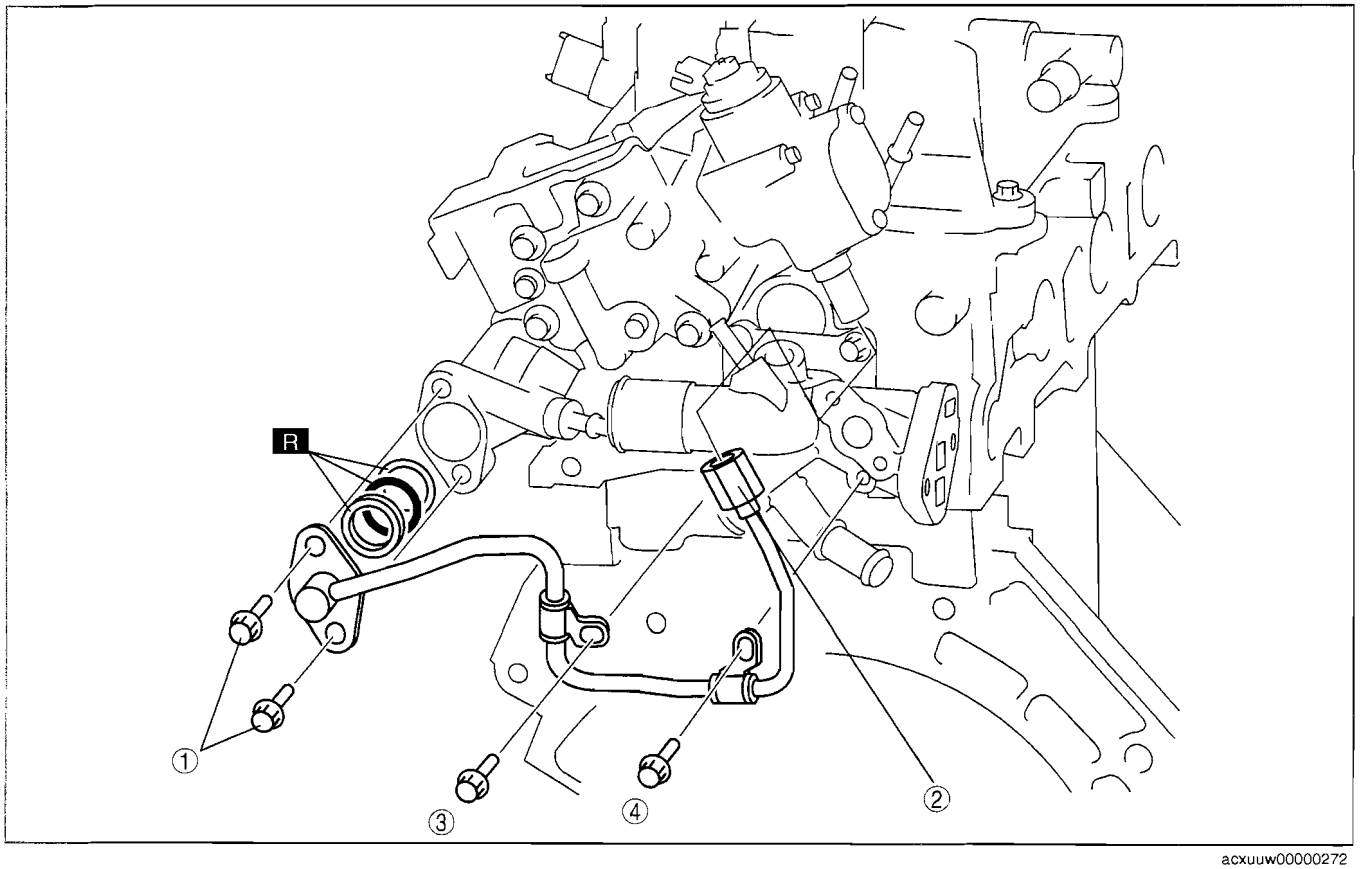
Tightening torque
17—23 N·m {1.8—2.3 kgf·m, 13—16 ft·lbf}



acxuuw00000271

High Pressure Line Pipe Installation Note

1. Temporarily tighten the bolts in the order shown in the figure.

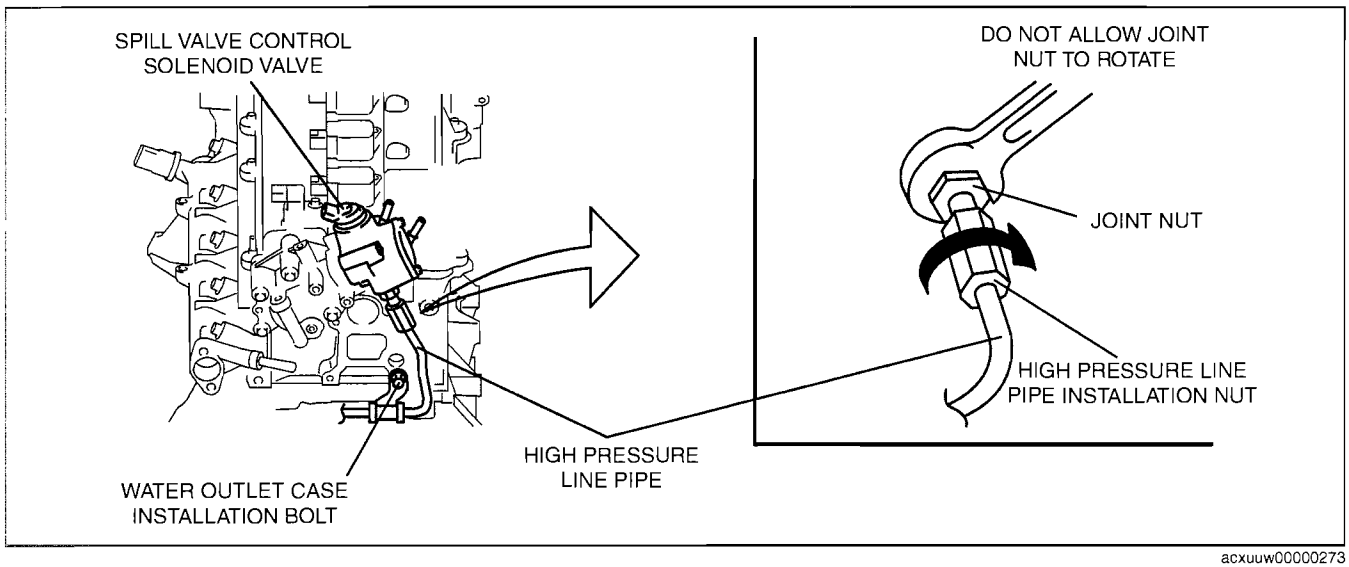


acxuuw00000272

2. Tighten No.1 bolts shown in the figure.

Tightening torque
17—23 N·m {1.8—2.3 kgf·m, 13—16 ft·lbf}

3. Tighten No.2 bolts shown in the figure.



acxuuw00000273

(1) Fix the joint nut with a wrench on the high pressure fuel pump side as shown in the figure.
(2) Tighten the high pressure line pipe installation nut.

Tightening torque
23.5—35.5 N·m {2.40—3.61 kgf·m, 17.4—26.1 ft·lbf}

4. Tighten No.3, No.4 bolts shown in the figure.

Tightening torque
17—23 N·m {1.8—2.3 kgf·m, 13—16 ft·lbf}

FUEL INJECTOR INSPECTION[L3 WITH TC]

id011439800700

Operation Test

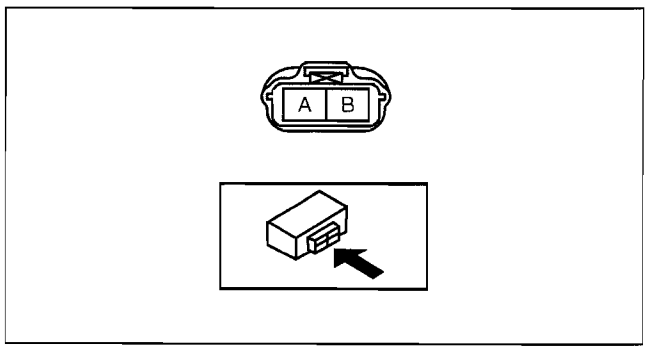
1. Carry out the "Fuel Injector Operation Inspection". (See01-03B-79 ENGINE CONTROL SYSTEM OPERATION INSPECTION[L3 WITH TC].)
   - If not as specified, perform the further inspection for the fuel injectors.

Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Remove the fuel delivery pipe. (See 01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
5. Disconnect the fuel injector connectors.
6. Measure the resistance of the fuel injector using a tester.
   - If not as specified, replace the fuel injector. (See01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
   - If as specified but "Operation Test" is failed, carry out the "Circuit Open/Short Inspection". Inspect for open or short circuit.

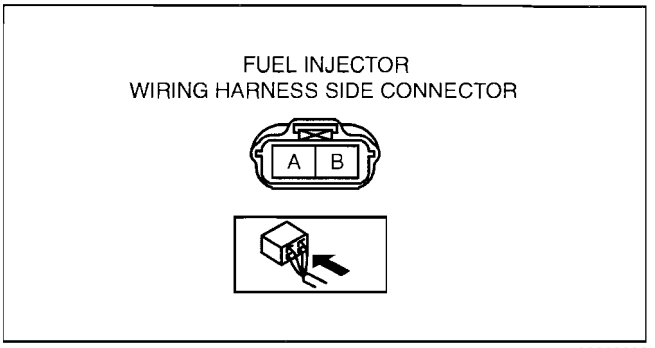
Fuel injector resistance
1.0—1.2 ohms [20 °C {68 °F}]



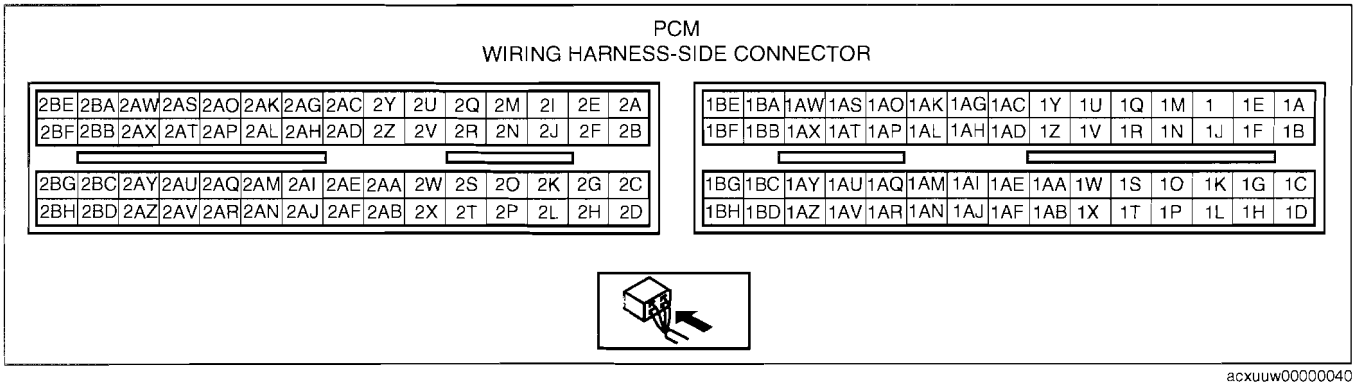
acxuuw00000038

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit (continuity check).



acxuuw00000039



acxuuw00000040

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - No.1 cylinder fuel injector terminal A and PCM terminal 2BB
  - No.2 cylinder fuel injector terminal A and PCM terminal 2BC
  - No.3 cylinder fuel injector terminal A and PCM terminal 2BD
  - No.4 cylinder fuel injector terminal A and PCM terminal 2AZ
  - No.1 cylinder fuel injector terminal B and PCM terminal 2BG
  - No.2 cylinder fuel injector terminal B and PCM terminal 2BH
  - No.3 cylinder fuel injector terminal B and PCM terminal 2BH
  - No.4 cylinder fuel injector terminal B and PCM terminal 2BG

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - No.1 cylinder fuel injector terminal A and power supply
  - No.1 cylinder fuel injector terminal A and body ground
  - No.2 cylinder fuel injector terminal A and power supply
  - No.2 cylinder fuel injector terminal A and body ground
  - No.3 cylinder fuel injector terminal A and power supply
  - No.3 cylinder fuel injector terminal A and body ground
  - No.4 cylinder fuel injector terminal A and power supply
  - No.4 cylinder fuel injector terminal A and body ground
  - No.1 cylinder fuel injector terminal B and power supply
  - No.1 cylinder fuel injector terminal B and body ground
  - No.2 cylinder fuel injector terminal B and power supply
  - No.2 cylinder fuel injector terminal B and body ground
  - No.3 cylinder fuel injector terminal B and power supply
  - No.3 cylinder fuel injector terminal B and body ground
  - No.4 cylinder fuel injector terminal B and power supply
  - No.4 cylinder fuel injector terminal B and body ground

PRESSURE REGULATOR INSPECTION[L3 WITH TC]

id011439800800

Note

- Due to the adoption of the mechanical returnless fuel system, the pressure regulator cannot be inspected separately.

1. Perform "FUEL LINE PRESSURE INSPECTION". (See 01-14B-6 FUEL LINE PRESSURE INSPECTION[L3 WITH TC].)

01-15A EXHAUST SYSTEM [LF, L3]

EXHAUST SYSTEM INSPECTION[LF, L3]

id0115a4800100

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
   - If there is leakage, repair or replace the appropriate component.

EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3]

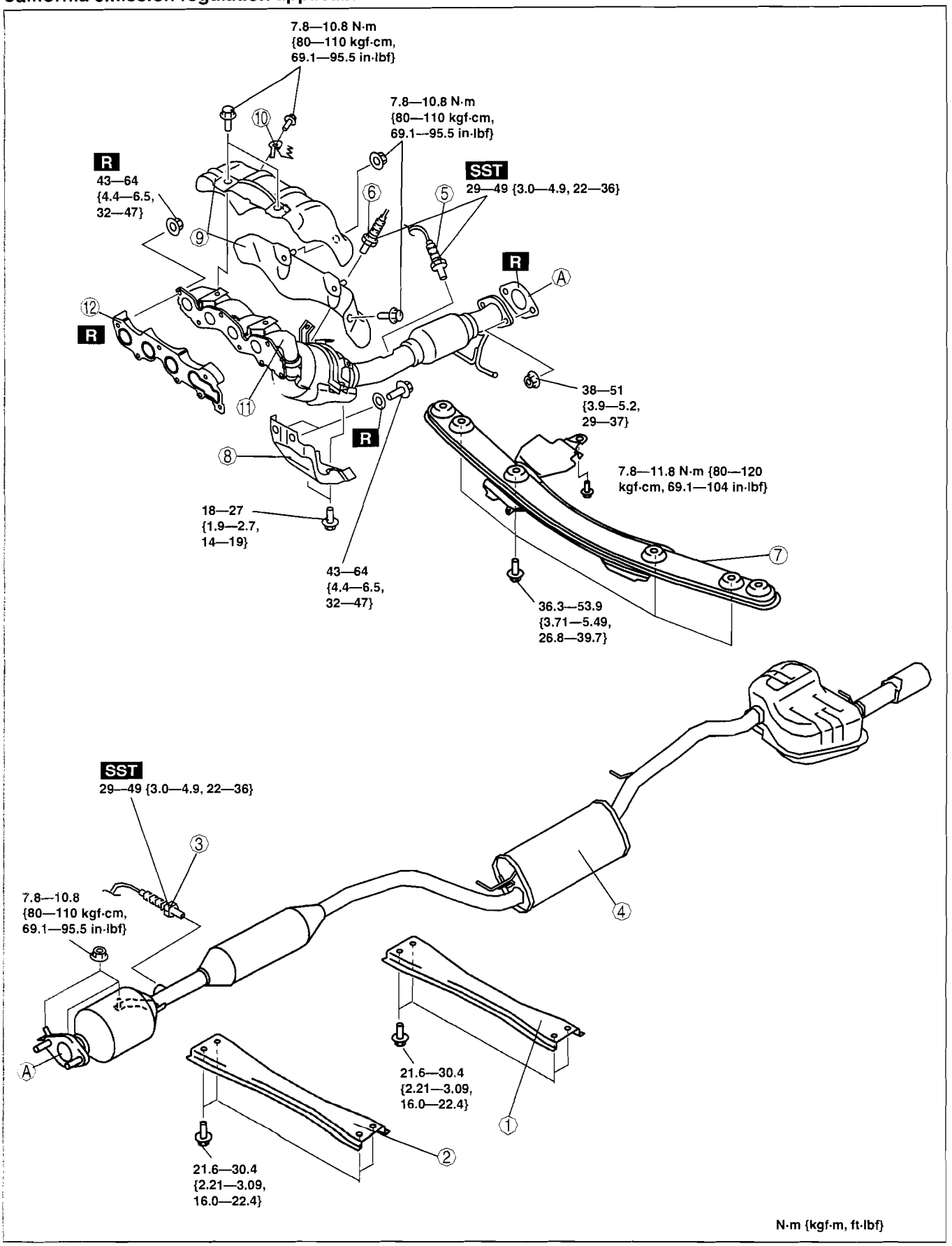
id0115a4800200

Warning

- **A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before removing the exhaust system.**

1. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery cover and battery duct. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Remove the under cover.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Inspect the wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.) (See 02-11-4 REAR WHEEL ALIGNMENT.)

California emission regulation applicable model

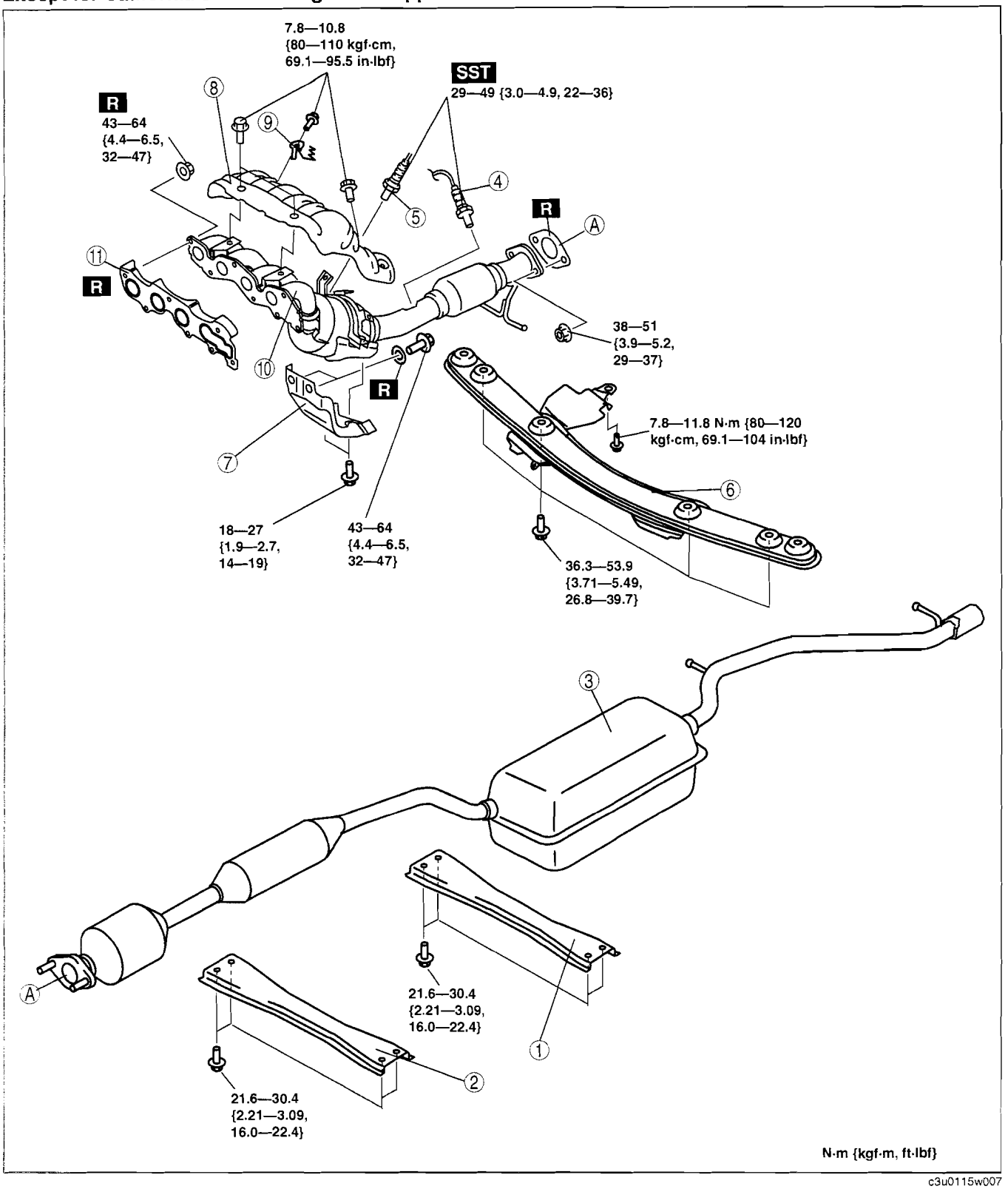


c3u0115w101

1	Rear tunnel member
2	Front tunnel member

3	Rear HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
4	Main silencer (See 01-15A-5 Main Silencer Removal Note.) (See 01-15A-6 THREE WAY CATALYTIC CONVERTER (TWC) REPLACEMENT[LF, L3].) (See 01-15A-10 PRESILENCER, MAIN SILENCER REPLACEMENT[LF, L3].) (See 01-15A-18 AFTER SILENCER/TAILPIPE REPLACEMENT[LF, L3].)
5	Middle HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
6	Front HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
7	Member
8	Exhaust manifold bracket
9	Exhaust manifold insulator
10	Clip
11	Exhaust manifold (See 01-15A-5 Exhaust Manifold Removal Note.) (See 01-15A-6 Exhaust Manifold Installation Note.)
12	Exhaust manifold gasket

Except for California emission regulation applicable model



c3u0115w007

1	Rear tunnel member
2	Front tunnel member

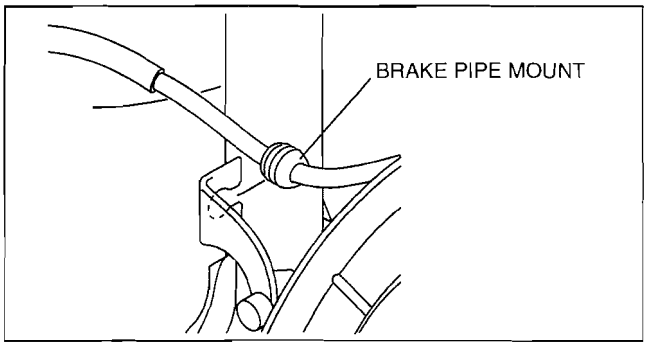
3	Main silencer (See 01-15A-5 Main Silencer Removal Note.) (See 01-15A-6 THREE WAY CATALYTIC CONVERTER (TWC) REPLACEMENT[LF, L3].) (See 01-15A-10 PRESILENCER, MAIN SILENCER REPLACEMENT[LF, L3].) (See 01-15A-18 AFTER SILENCER/TAILPIPE REPLACEMENT[LF, L3].)

4	Rear HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
5	Front HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].)
6	Member
7	Exhaust manifold bracket
8	Exhaust manifold insulator
9	Clip
10	Exhaust manifold (See 01-15A-5 Exhaust Manifold Removal Note.) (See 01-15A-6 Exhaust Manifold Installation Note.)
11	Exhaust manifold gasket

Main Silencer Removal Note

Except for California emission regulation applicable model

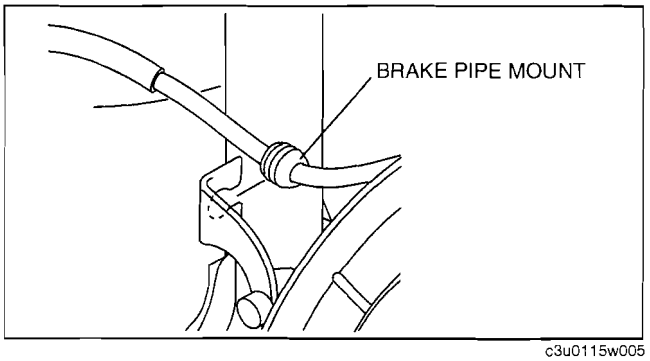
1. Disconnect the ABS wheel-speed sensor wiring harness connector.
2. Disengage the brake pipe mount from bracket.
3. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
4. Loosen the rear crossmember component installation bolts (6 locations) and lower the rear crossmember component **approx. 70 mm {2.8 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
5. Remove the main silencer.



c3u0115w005

California emission regulation applicable model

1. Remove the rear wheels and tires.
2. Disconnect the ABS wheel-speed sensor wiring harness connector.
3. Disengage the brake pipe mount from bracket.
4. Remove the caliper component installation bolts, remove the parking brake cable from the caliper, and then set the caliper out of the way. (See 04-11-30 REAR BRAKE (DISC) REMOVAL/INSTALLATION.)
5. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
6. Remove the rear trailing link installation bolts (4 locations). (See 02-14-8 REAR TRAILING LINK REMOVAL/INSTALLATION.)
7. Remove the rear crossmember component installation bolts (6 locations) and lower the rear crossmember component. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
8. Remove the main silencer.



c3u0115w005

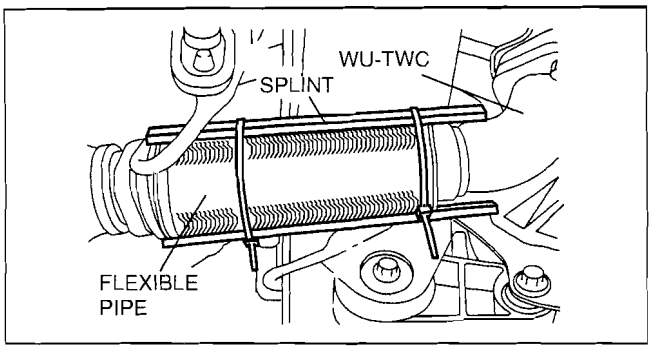
Exhaust Manifold Removal Note

Caution

- **Over bending of the exhaust flexible pipe may cause damage resulting in failure.**

1. Remove the front wheels and tires.
2. Disconnect the steering shaft from the steering gear and linkage side. (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
3. Remove the No.1 engine mount rubber. (See 01-10A-28 ENGINE REMOVAL/INSTALLATION[LF, L3].)
4. Loosen the exhaust manifold bolts.
5. Remove the installation bolts of the front stabilizer and stabilizer control link. (See 02-13-11 FRONT STABILIZER REMOVAL/INSTALLATION.)
6. Loosen the front crossmember component installation bolts and lower the front crossmember component **approx. 100 mm {3.94 in}**. (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)

7. Support the flexible pipe with a support wrap or splint as shown in the figure.
8. Remove the exhaust manifold by lowering it to the underside of the vehicle.

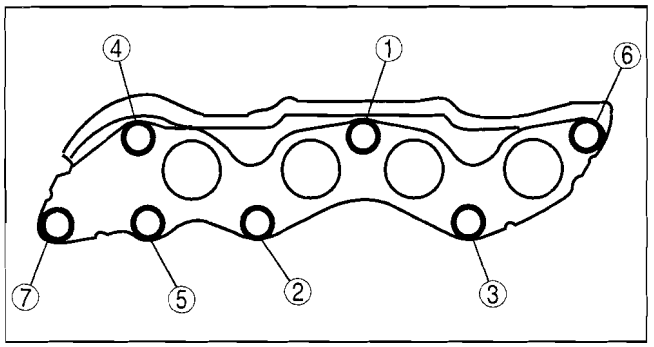


c3u0115w003

Exhaust Manifold Installation Note

1. Tighten the exhaust manifold installation nuts in the order shown in the figure.

Tightening torque
43—64 N·m {4.4—6.5 kgf·m, 32—47 ft·lbf}



c3u0115w004

THREE WAY CATALYTIC CONVERTER (TWC) REPLACEMENT[LF, L3]

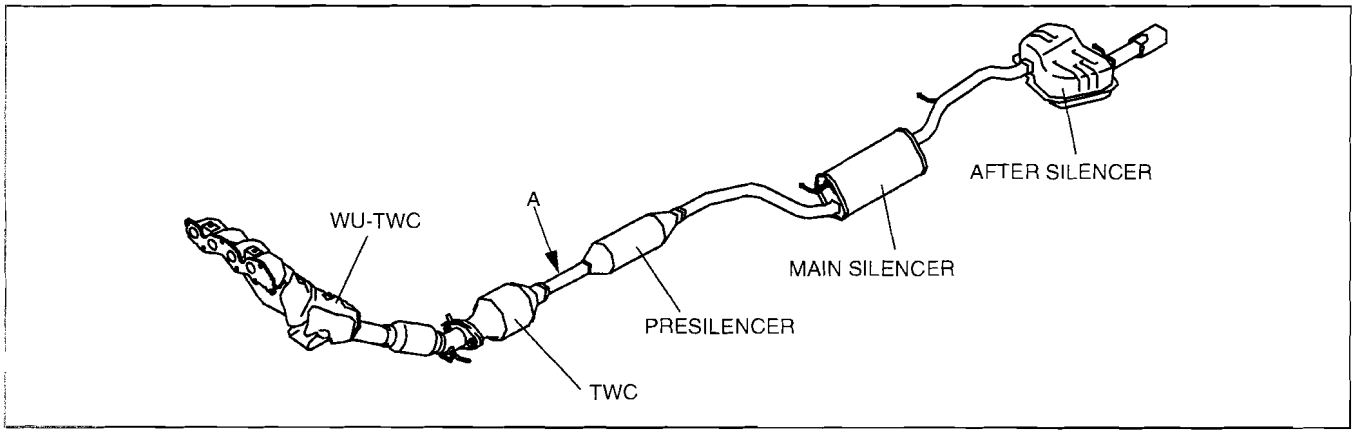
id0115a4801000

California Emission Regulation Applicable Model

Note

- The TWC is integrated with the presilencer and main silencer. Therefore, when replacing the TWC, cut between the TWC and presilencer.

Cut Location



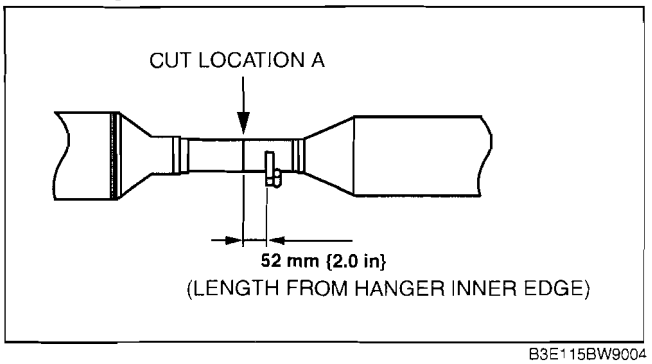
e3u115zw6301

1. Remove the rear tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove the front tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)

Caution

- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

3. Cut the pipe between the TWC and presilencer using the following procedure. (Cut location A)
   (1) Measure the length from the hanger inner edge.
   (2) Cut the pipe at the specified location.
4. Remove the nut and TWC.
5. Remove burrs from the cut surface on the presilencer side using a round file.
6. Install the new TWC to the presilencer using the following procedure. (Cut location A)

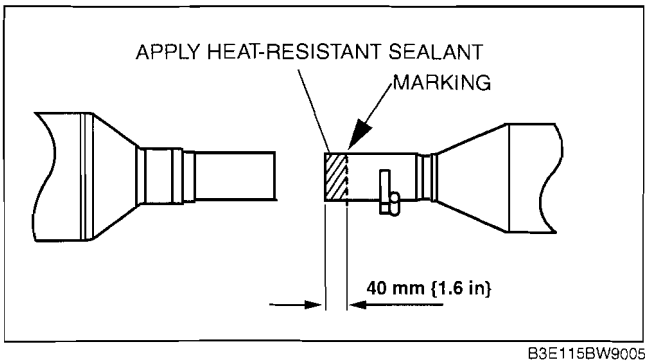


B3E115BW9004

   (1) Measure the indicated length from the cut surface of the presilencer to the marking.
   (2) Apply heat-resistant sealant to the marked position along the complete perimeter.

Note
- The TWC installation nut should remain untightened.

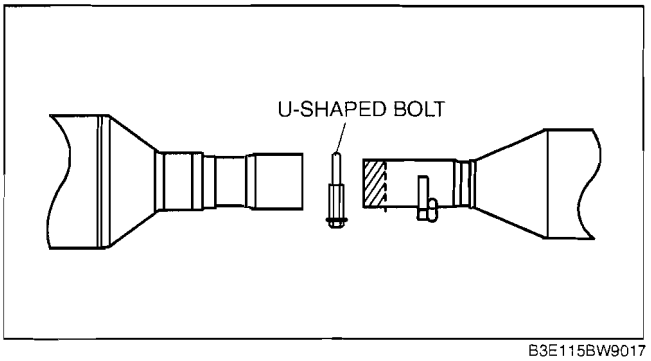
   (3) Replace the gasket with a new one and install the new TWC to the WU-TWC.



B3E115BW9005

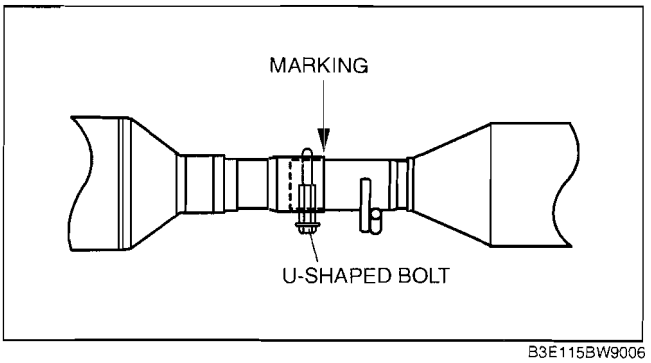
Note
- The U-shaped bolt can be inserted to the pipe on either side.

   (4) Insert the U-shaped bolt.



B3E115BW9017

   (5) Insert the TWC to the presilencer, and align the cut surface of the pipe with the marking.
7. Tighten the TWC installation nut. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)

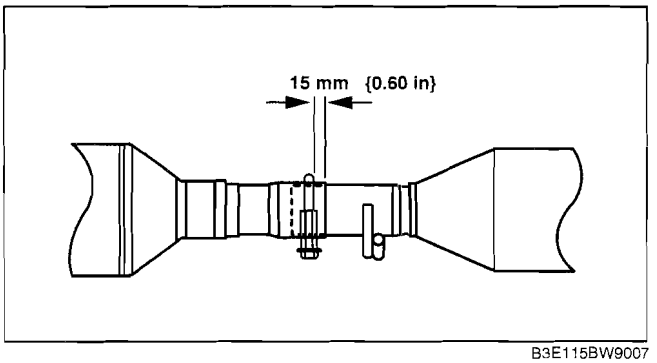


B3E115BW9006

8. Tighten the U-shaped bolt between the presilencer and the new TWC using the following procedure. (Cut location A)

Note
- The TWC has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.



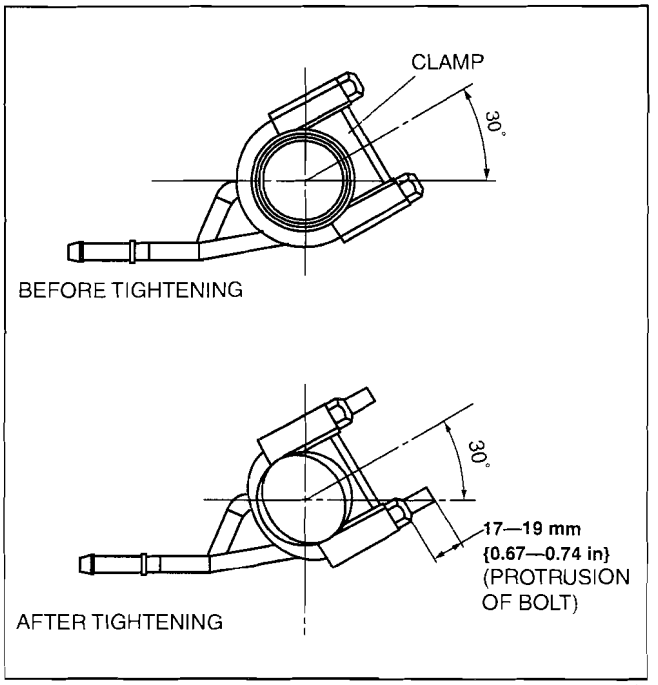
B3E115BW9007

(2) Set the U-shaped bolt so that the clearance between the bolt and surrounding parts is as indicated in the figure.

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

(3) Tighten the U-shaped bolt.

Protrusion of U-shaped bolt after tightening
17—19 mm {0.67—0.74 in}

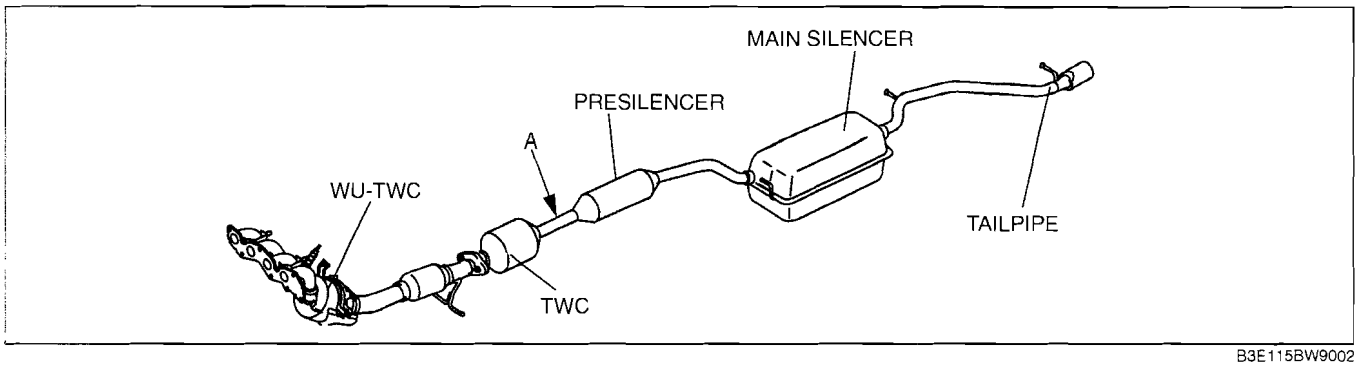


e3u115zw6306

Except for California Emission Regulation Applicable Model

Note
- The TWC is integrated with the presilencer and main silencer. Therefore, when replacing the TWC, cut between the TWC and presilencer.

Cut Location

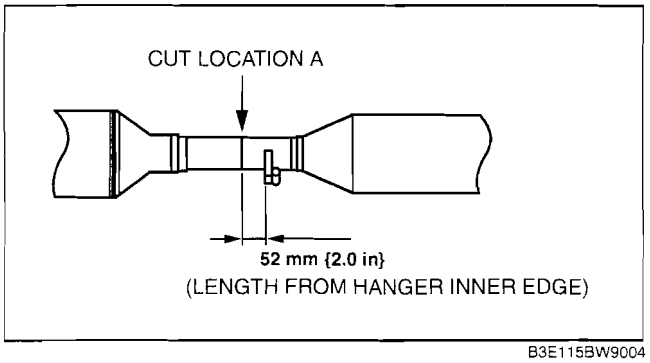


B3E115BW9002

1. Remove the rear tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove the front tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)

Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

3. Cut the pipe between the TWC and presilencer using the following procedure. (Cut location A)
   (1) Measure the length from the hanger inner edge.
   (2) Cut the pipe at the specified location.
4. Remove the nut and TWC.
5. Remove burrs from the cut surface on the presilencer side using a round file.
6. Install the new TWC to the presilencer using the following procedure. (Cut location A)



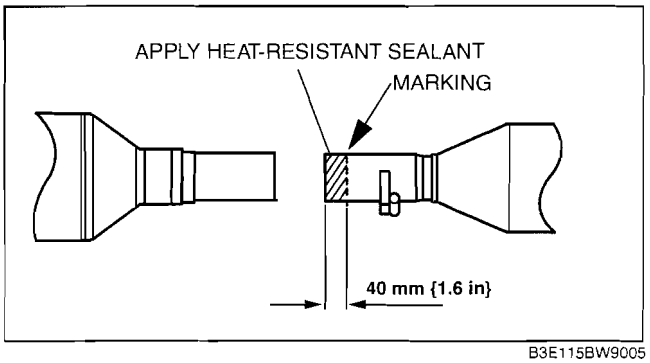
B3E115BW9004

   (1) Measure the indicated length from the cut surface of the presilencer to the marking.
   (2) Apply heat-resistant sealant to the marked position along the complete perimeter.

Note
- The TWC installation nut should remain untightened.

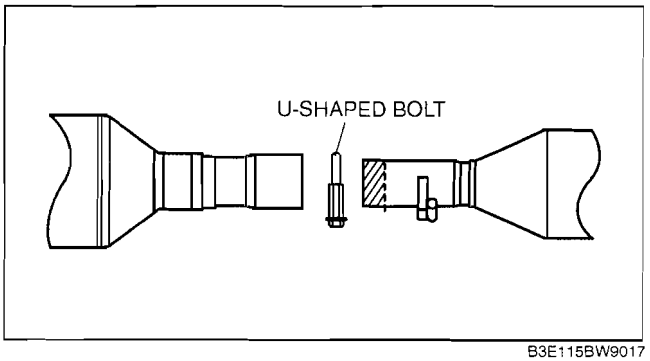
   (3) Replace the gasket with a new one and install the new TWC to the WU-TWC.

Note
- The U-shaped bolt can be inserted to the pipe on either side.



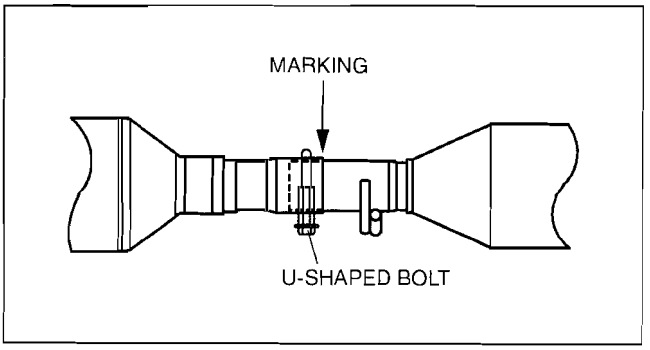
B3E115BW9005

   (4) Insert the U-shaped bolt.



B3E115BW9017

   (5) Insert the TWC to the presilencer, and align the cut surface of the pipe with the marking.
7. Tighten the TWC installation nut. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)

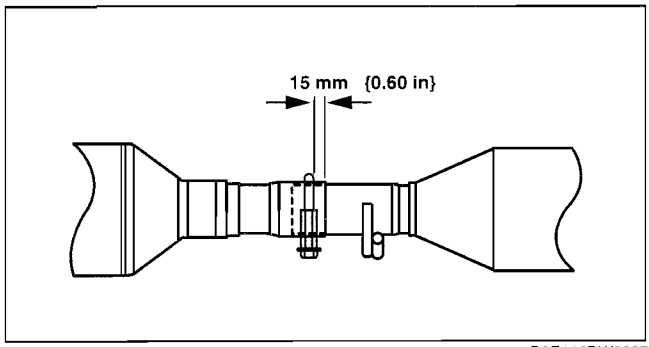


B3E115BW9006

8. Tighten the U-shaped bolt between the presilencer and the new TWC using the following procedure. (Cut location A)

Note
- The TWC has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.



B3E115BW9007

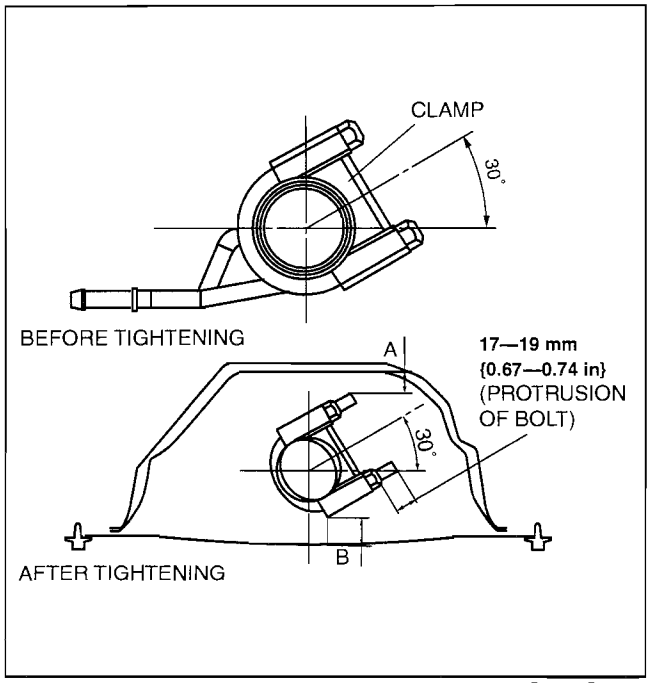
(2) Set the U-shaped bolt so that the clearance between the bolt and surrounding parts is as indicated in the figure.

A: Clearance between the U-shaped bolt end and the vehicle side insulator
10 mm {0.40 in} or longer
B: Clearance between the U-shaped bolt and the tunnel member
20 mm {0.79 in} or longer

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

(3) Tighten the U-shaped bolt.

Protrusion of U-shaped bolt after tightening
17—19 mm {0.67—0.74 in}



B3E115BW9008

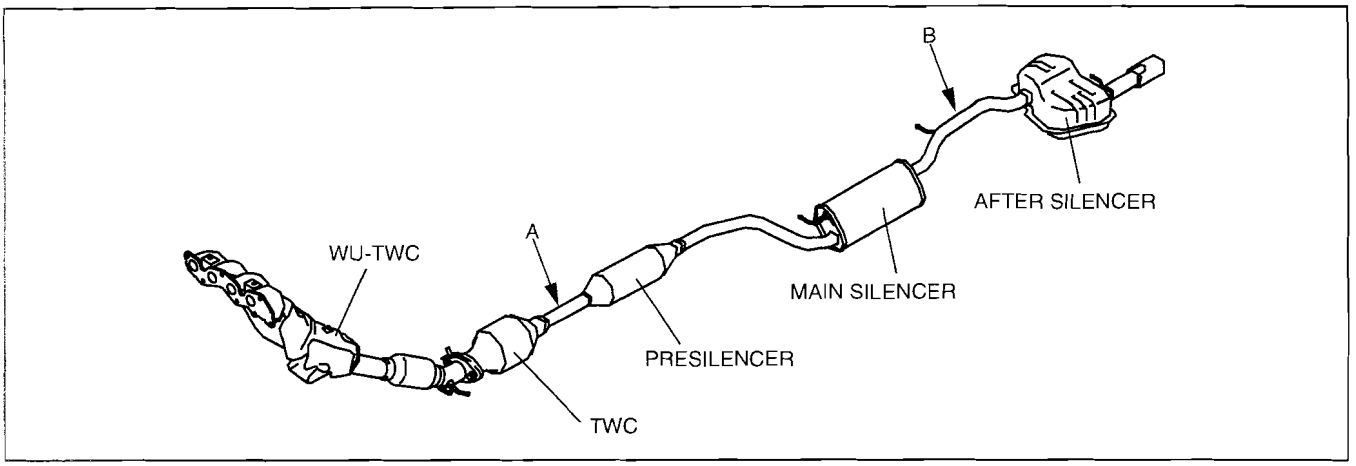
PRESILENCER, MAIN SILENCER REPLACEMENT[LF, L3]

id0115a4800800

California Emission Regulation Applicable Model

Note
- The presilencer and main silencer are integrated with the TWC and after silencer. Therefore, when replacing the presilencer and main silencer, cut between the TWC and presilencer, and between the main silencer and after silencer.
- After bending the body insulator to secure a work space, return it to its original condition after the installation.
- After the installation, verify that there is no noise.

Cut Location



e3u115zw6307

1. Remove the rear tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove the front tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
3. Remove three rubber hangers from back side.

Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

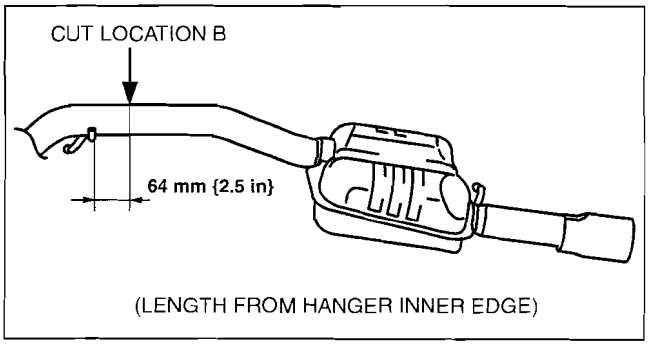
4. Cut the pipe between the main silencer and the after silencer using the following procedure. (Cut location B)

Note
- Perform measurement parallel to the pipe being cut.

(1) Measure the length from the hanger inner edge at the end.
(2) Cut the pipe at the specified location.

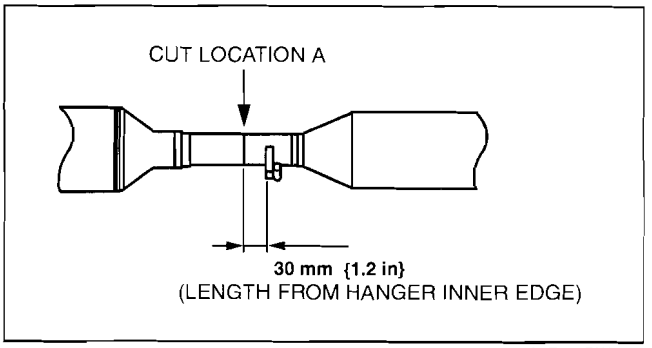
Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

Note
- The pipe can be cut after removing it from the vehicle. In this case, replace the gasket with a new one.



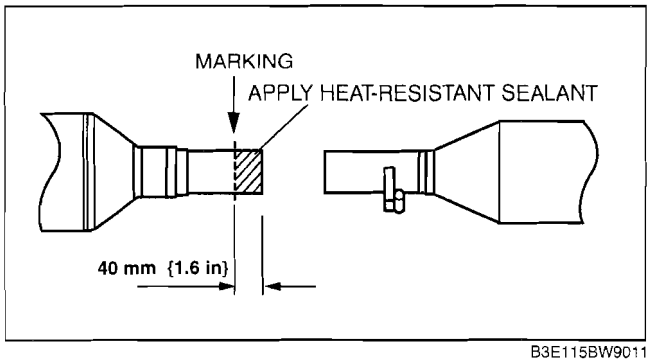
e3u115zw6302

5. Cut the pipe between the TWC and presilencer using the following procedure. (Cut location A)
   (1) Measure the length from the hanger end.
   (2) Cut the pipe at the specified location.
6. Remove burrs from the cut surface on both the TWC and the after silencer side using a round file.



B3E115BW9010

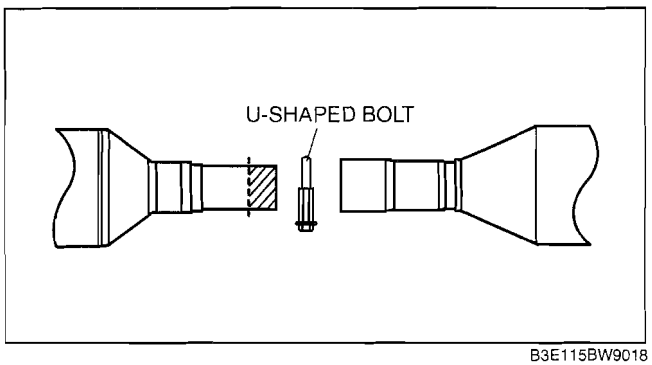
7. Install the new presilencer and main silencer to the TWC using the following procedure. (Cut location A)
   (1) Measure the indicated length from the cut surface of the TWC to the marking.
   (2) Apply heat-resistant sealant to the marked position along the complete perimeter.
   (3) If the pipe is cut after removing it from the vehicle, replace the gasket with a new one and install the TWC to the WU-TWC. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)



B3E115BW9011

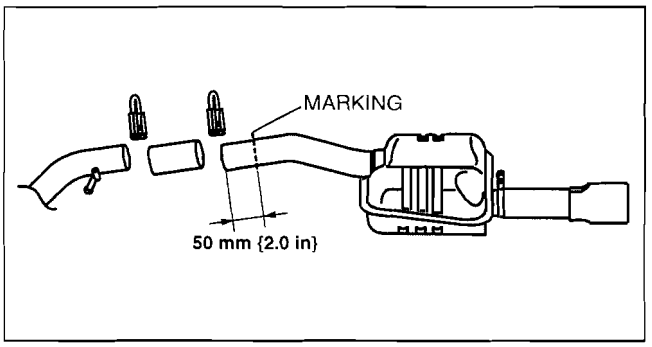
Note
- The U-shaped bolt can be inserted to the pipe on either side.

   (4) Insert the U-shaped bolt.
   (5) Insert the new presilencer to the TWC, and align the cut surface of the pipe with the marking.
   (6) Secure the exhaust pipe to the rubber hanger.



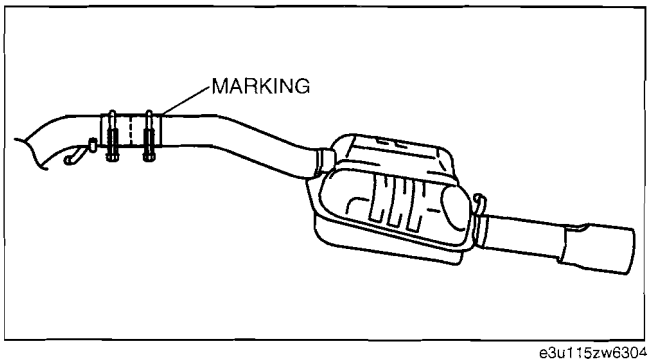
B3E115BW9018

8. Install the new presilencer and main silencer to the after silencer using the following procedure. (Cut location B)
   (1) Remove the after silencer from the rubber hanger.
   (2) Measure the indicated length from the cut surface of the after silencer to the marking.
   (3) Apply heat-resistant sealant to the specified position along the complete perimeter.
   (4) Insert the U-shaped bolt.
   (5) Insert the joint pipe to the main silencer.
   (6) Insert the after silencer to the joint pipe.
   (7) Secure the exhaust pipe to the rubber hanger.



e3u115zw6303

   (8) Align the cut surface of the joint pipe with the marking.
   (9) Verify that the exhaust pipe is installed without any bends or strain on the pipe.

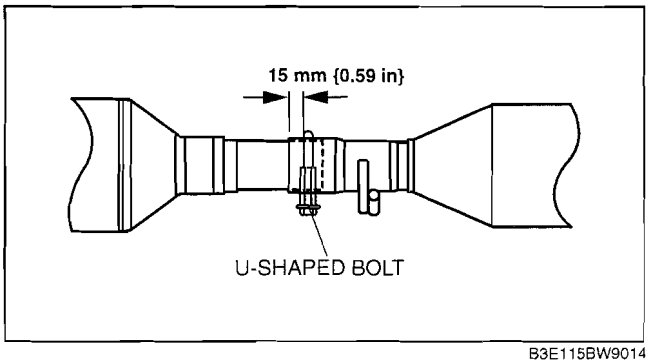


e3u115zw6304

9. Tighten the U-shaped bolt between the TWC and the new presilencer using the following procedure. (Cut location A)

Note
- The presilencer has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.



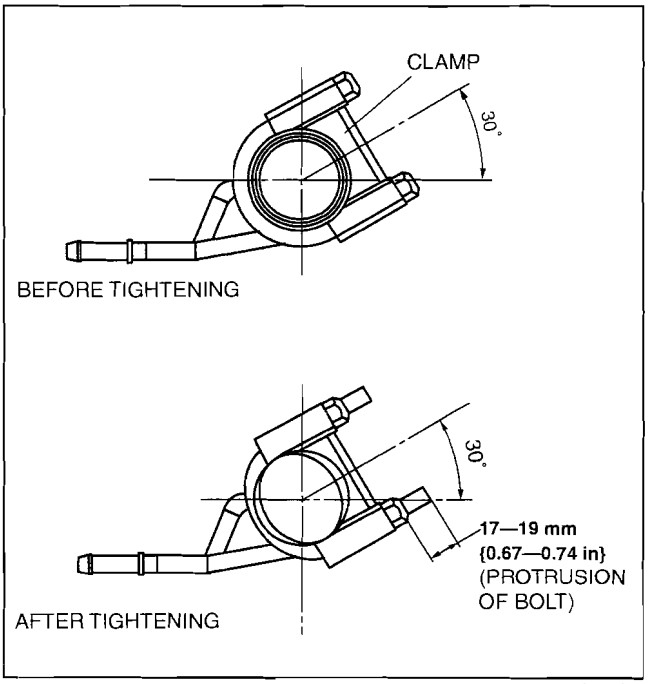
B3E115BW9014

(2) Set the U-shaped bolt so that the clearance between the bolt and surrounding parts is as indicated in the figure.

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

(3) Tighten the U-shaped bolt.

Protrusion of U-shaped bolt after tightening
17—19 mm {0.67—0.74 in}

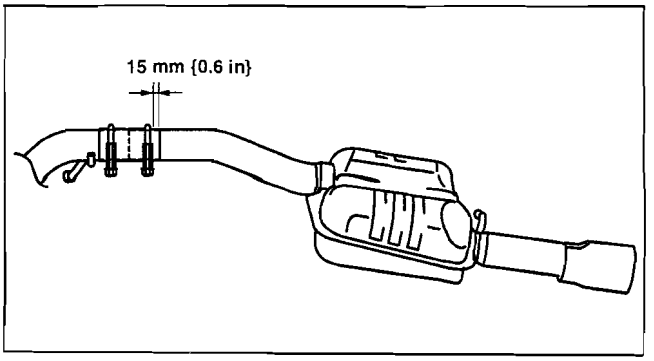


e3u115zw6306

10. Tighten the U-shaped bolt between the after silencer and the new main silencer using the following procedure. (Cut location B)

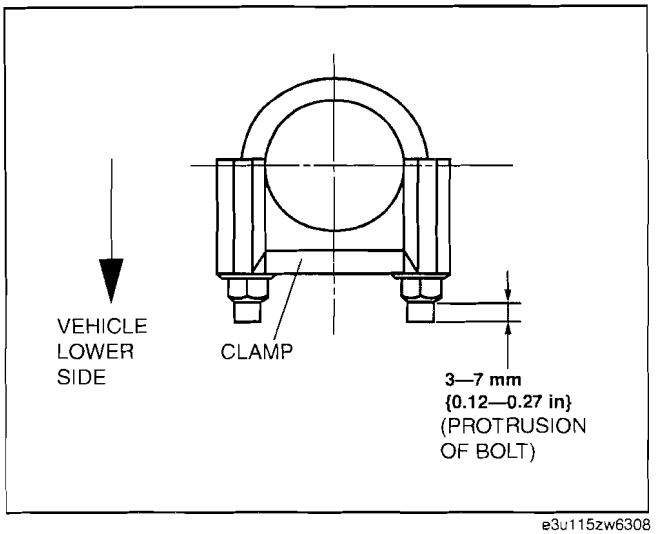
Note
- The joint pipe has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.



e3u115zw6305

(2) Set the U-shaped bolt so that it faces the vehicle lower side.



e3u115zw6308

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

Note
- Tighten the U-shaped bolt on the main silencer side first, then the after silencer side.

(3) Tighten the U-shaped bolt on the main silencer side.

Protrusion of U-shaped bolt after tightening
3—7 mm {0.12—0.27 in}

(4) Gradually tighten the U-shaped bolt on the after silencer side verifying that the after silencer end is at the center of the bumper as viewed from behind the vehicle.

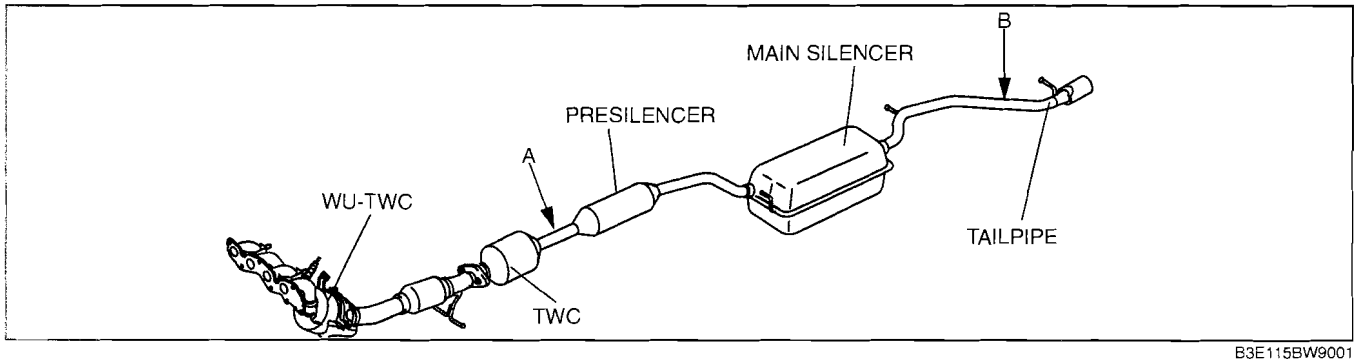
Protrusion of U-shaped bolt after tightening
3—7 mm {0.12—0.27 in}

11. Start the engine, and verify that there is no noise.

Except for California Emission Regulation Applicable Model

Note
- The presilencer and main silencer are integrated with the TWC and tailpipe. Therefore, when replacing the presilencer and main silencer, cut between the TWC and presilencer, and between the main silencer and tailpipe.

Cut Location



B3E115BW9001

1. Remove the rear tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove the front tunnel member. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)

Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

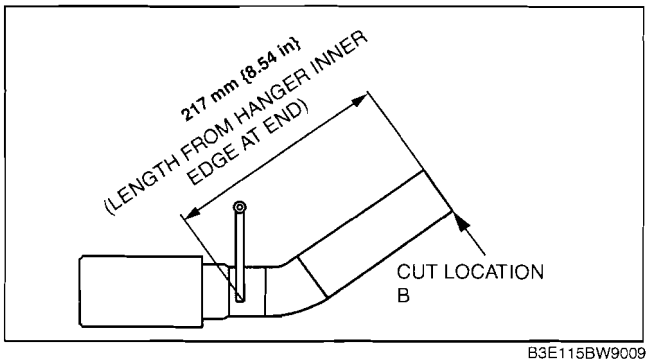
3. Cut the pipe between the main silencer and tailpipe using the following procedure. (Cut location B)

Note
- Perform measurement parallel to the pipe being cut.

(1) Measure the length from the hanger inner edge at the end.
(2) Cut the pipe at the specified location.

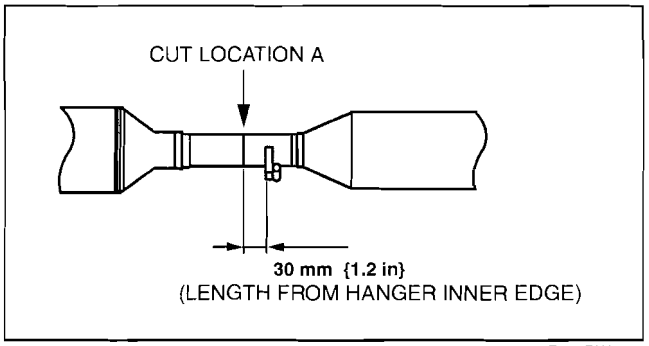
Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

Note
- The pipe can be cut after removing it from the vehicle. In this case, replace the gasket with a new one.



B3E115BW9009

4. Cut the pipe between the TWC and presilencer using the following procedure. (Cut location A)
(1) Measure the length from the hanger end.
(2) Cut the pipe at the specified location.
5. Remove burrs from the cut surface on both the TWC and tail pile side using a round file.

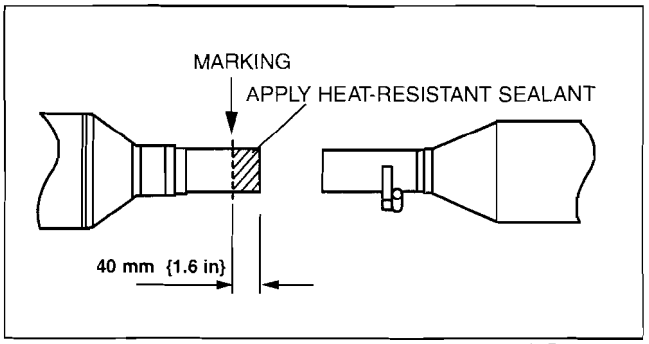


B3E115BW9010

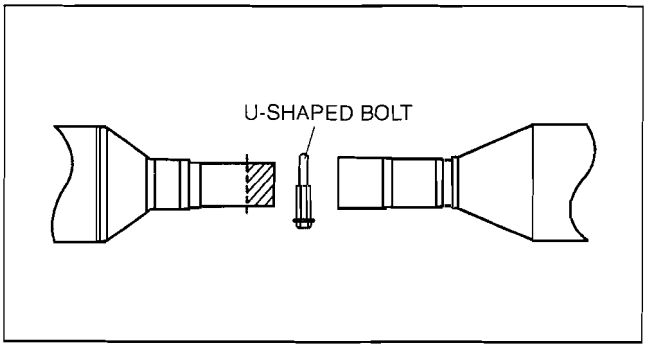
6. Install the new presilencer and main silencer to the TWC using the following procedure. (Cut location A)
(1) Measure the indicated length from the cut surface of the TWC to the marking.
(2) Apply heat-resistant sealant to the marked position along the complete perimeter.
(3) If the pipe is cut after removing it from the vehicle, replace the gasket with a new one and install the TWC to the WU-TWC. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/ INSTALLATION[LF, L3].)

Note
- The U-shaped bolt can be inserted to the pipe on either side.

(4) Insert the U-shaped bolt.
(5) Insert the new presilencer to the TWC, and align the cut surface of the pipe with the marking.
(6) Secure the exhaust pipe to the rubber hanger.

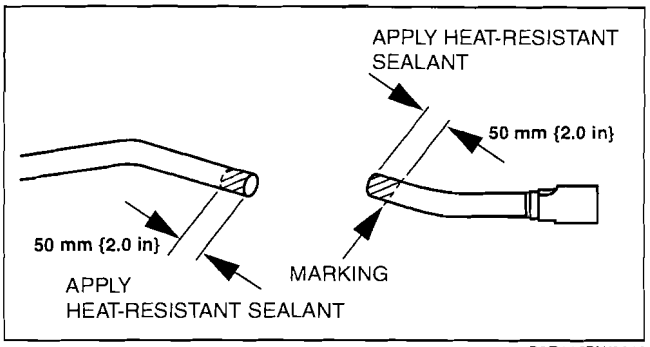


B3E115BW9011



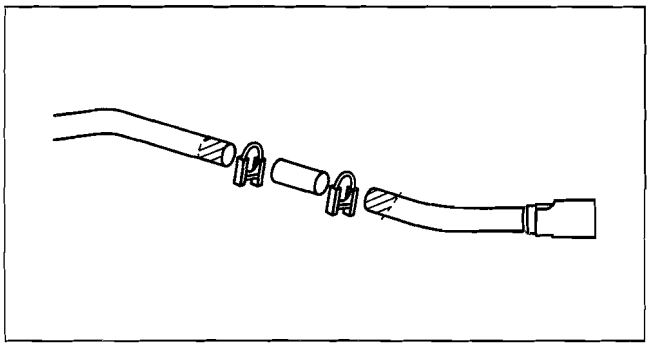
B3E115BW9018

7. Install the new presilencer and main silencer to the tailpipe using the following procedure. (Cut location B)
   (1) Remove the tailpipe from the rubber hanger.
   (2) Measure the indicated length from the cut surface of the tailpipe to the marking.
   (3) Apply heat-resistant sealant to the specified position along the complete perimeter.

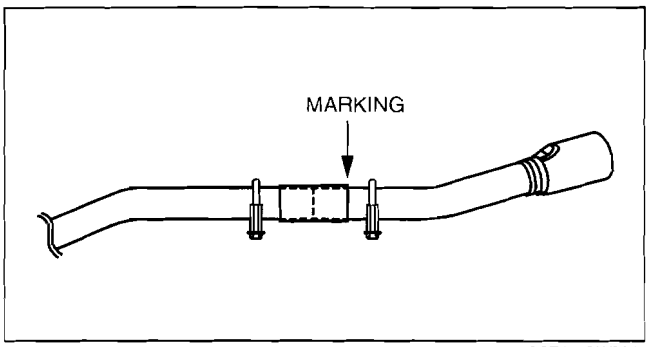


B3E115BW9012

   (4) Insert the U-shaped bolt.
   (5) Insert the joint pipe to the main silencer.
   (6) Insert the tailpipe to the joint pipe.
   (7) Secure the exhaust pipe to the rubber hanger.


B3E115BW9019

   (8) Align the cut surface of the joint pipe with the marking.
   (9) Verify that the exhaust pipe is installed without any bends or strain on the pipe.

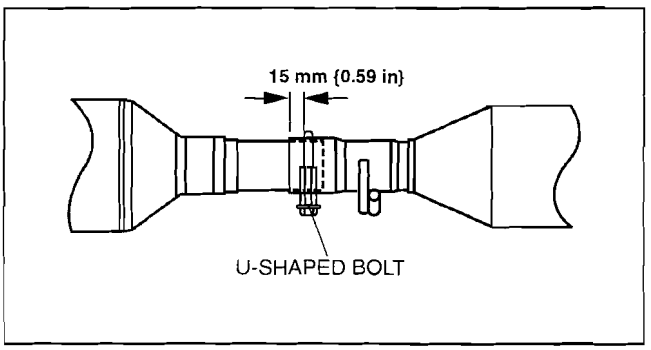


B3E115BW9013

8. Tighten the U-shaped bolt between the TWC and the new presilencer using the following procedure. (Cut location A)

Note
- The presilencer has a marked line at the specified position where the U-shaped bolt is to be set.

   (1) Set the U-shaped bolt in the specified position.



B3E115BW9014

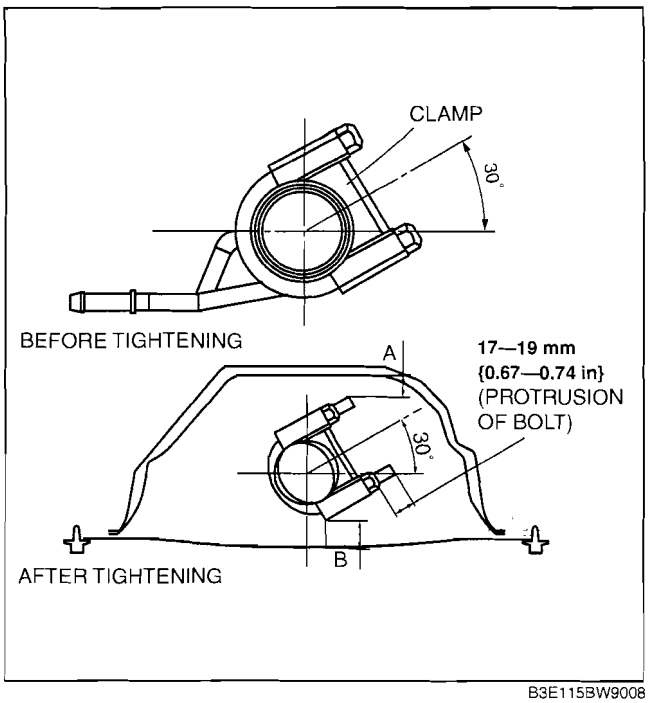
(2) Set the U-shaped bolt so that the clearance between the bolt and surrounding parts is as indicated in the figure.

A: Clearance between the U-shaped bolt end and the vehicle side insulator
10 mm {0.40 in} or longer
B: Clearance between the U-shaped bolt and the tunnel member
20 mm {0.79 in} or longer

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

(3) Tighten the U-shaped bolt.

Protrusion of U-shaped bolt after tightening
17—19 mm {0.67—0.74 in}

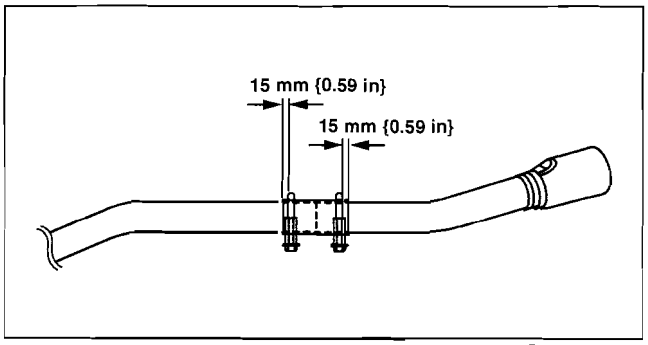


B3E115BW9008

9. Tighten the U-shaped bolt between the tailpipe and the new main silencer using the following procedure. (Cut location B)

Note
- The joint pipe has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.

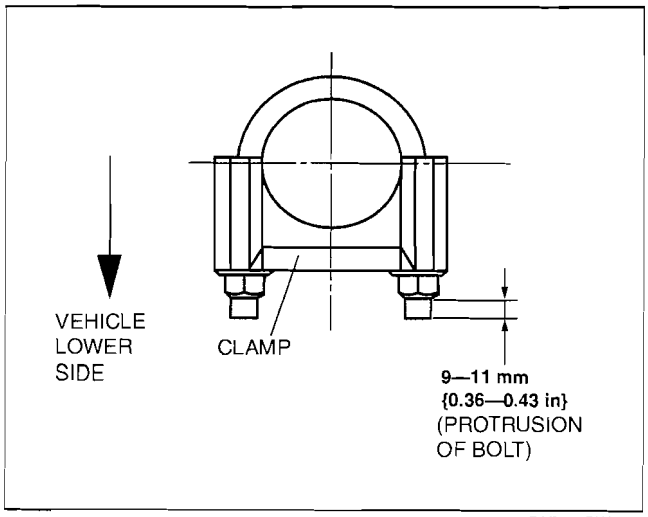


B3E115BW9015

(2) Set the U-shaped bolt so that it faces the vehicle lower side.

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

Note
- Tighten the U-shaped bolt on the main silencer side first, then the tailpipe side.



B3E115BW9016

(3) Tighten the U-shaped bolt on the main silencer side.

Protrusion of U-shaped bolt after tightening
9—11 mm {0.36—0.43 in}

(4) Gradually tighten the U-shaped bolt on the tailpipe side verifying that the tailpipe end is at the center of the bumper as viewed from behind the vehicle.

Protrusion of U-shaped bolt after tightening
9—11 mm {0.36—0.43 in}

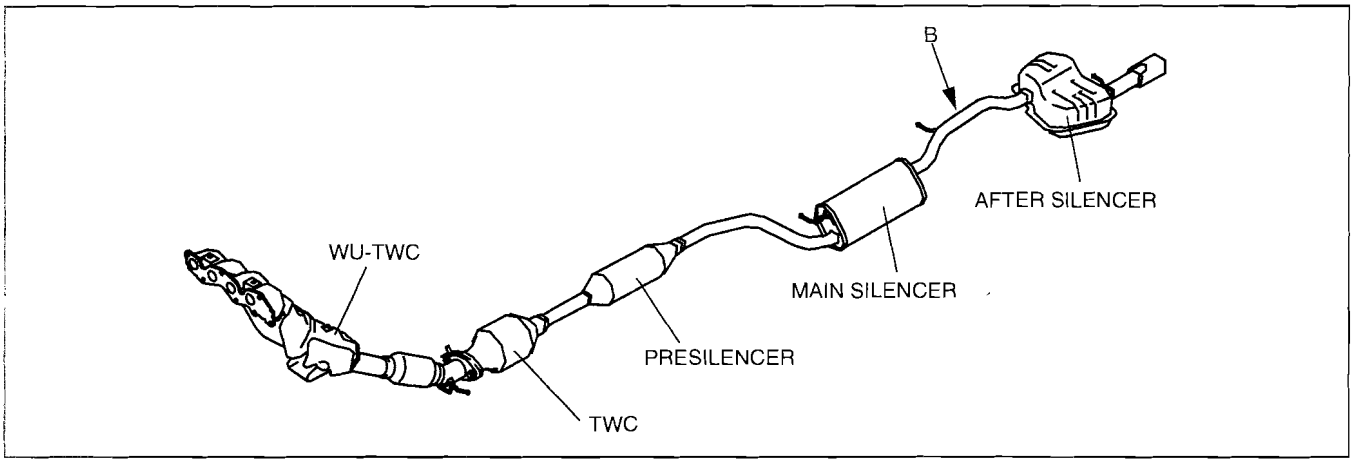
AFTER SILENCER/TAILPIPE REPLACEMENT[LF, L3]

id0115a4801100

California Emission Regulation Applicable Model

Note
- The after silencer is integrated with the presilencer and main silencer. Therefore, when replacing the after silencer, cut between the main silencer and after silencer.
- After bending the body insulator to secure a work space, return it to its original condition after the installation.
- After the installation, verify that there is no noise.

Cut Location



e3u115zw6309

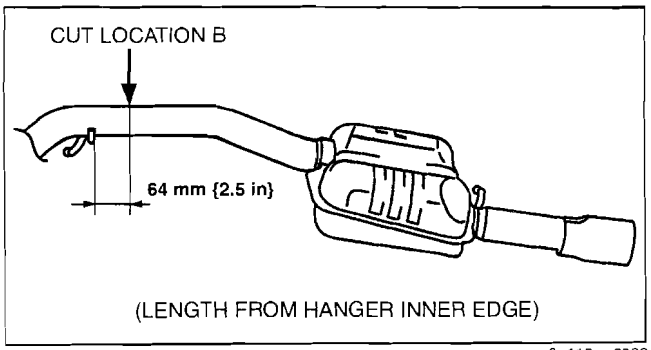
Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

1. Remove three rubber hangers from back side.
2. Cut the pipe between the main silencer and after silencer using the following procedure. (Cut location B)

Note
- Perform measurement parallel to the pipe being cut.

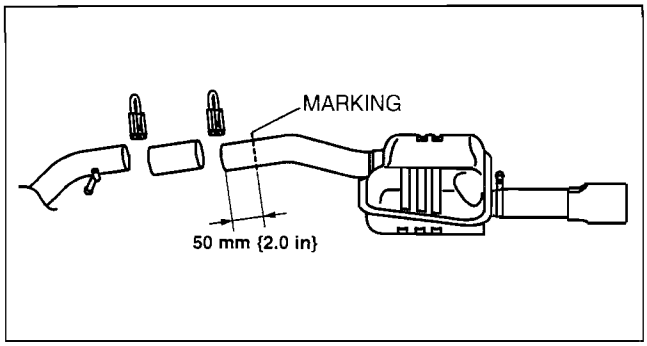
(1) Measure the length from the hanger inner edge at the end.
(2) Cut the pipe at the specified location.

3. Remove burrs from the cut surface on the main silencer side using a round file.



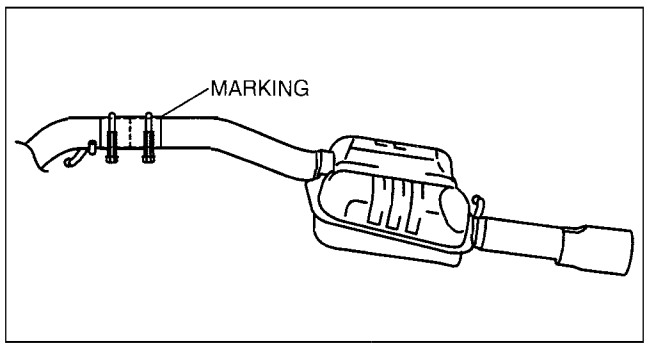
e3u115zw6302

4. Install the new after silencer to the main silencer using the following procedure. (Cut location B)
   (1) Measure the indicated length from the cut surface of the new after silencer to the marking.
   (2) Apply heat-resistant sealant to the specified position along the complete perimeter.
   (3) Insert the U-shaped bolt.
   (4) Insert the joint pipe to the main silencer.
   (5) Insert the after silencer to the joint pipe.
   (6) Secure the exhaust pipe to the rubber hanger.



e3u115zw6303

   (7) Align the cut surface of the joint pipe with the marking.
   (8) Verify that the exhaust pipe is installed without any bends or strain on the pipe.

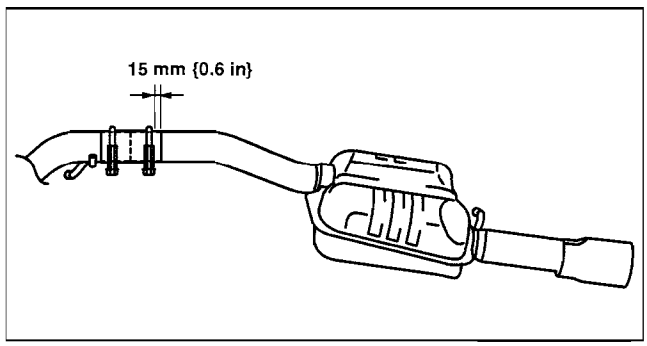


e3u115zw6304

5. Tighten the U-shaped bolt between the main silencer and the new after silencer using the following procedure. (Cut location B)

Note
- The joint pipe has a marked line at the specified position where the U-shaped bolt is to be set.

   (1) Set the U-shaped bolt in the specified position.

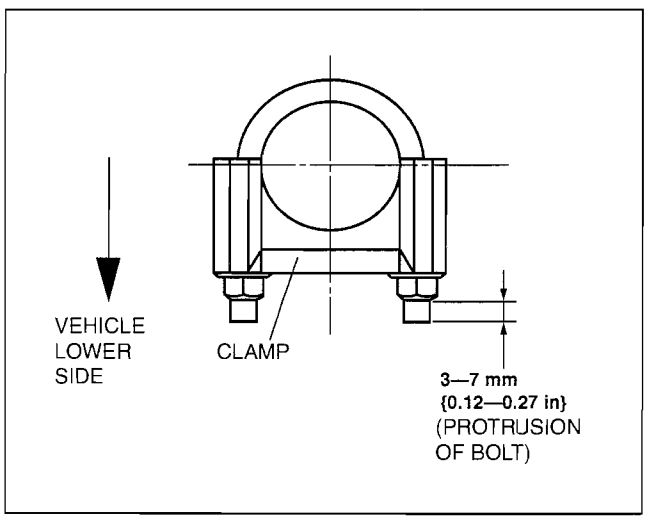


e3u115zw6305

   (2) Set the U-shaped bolt so that it faces the vehicle lower side.

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

Note
- Tighten the U-shaped bolt on the main silencer side first, then the after silencer side.



e3u115zw6308

(3) Tighten the U-shaped bolt on the main silencer side.

Protrusion of U-shaped bolt after tightening
3—7 mm {0.12—0.27 in}

(4) Gradually tighten the U-shaped bolt on the after silencer side verifying that the after silencer end is at the center of the bumper as viewed from behind the vehicle.

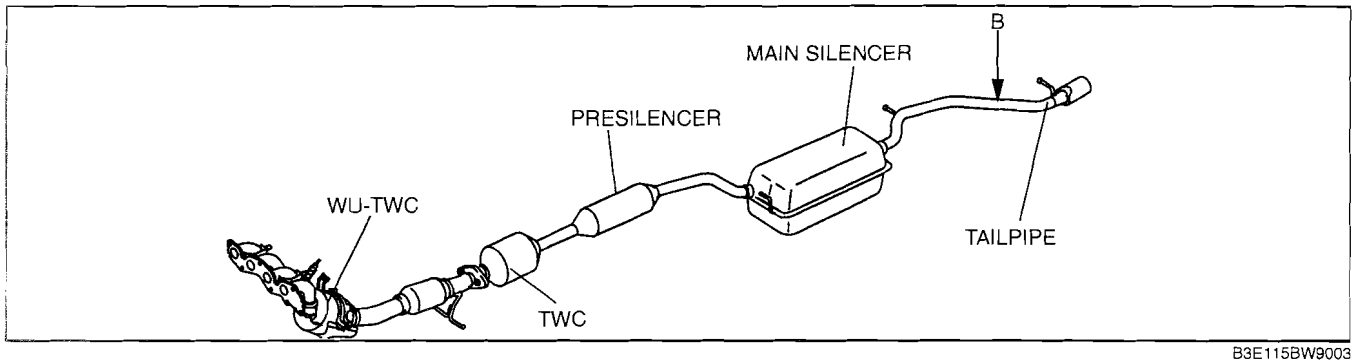
Protrusion of U-shaped bolt after tightening
3—7 mm {0.12—0.27 in}

6. Start the engine, and verify that there is no noise.

Except for California Emission Regulation Applicable Model

Note
- The tailpipe is integrated with the presilencer and main silencer. Therefore, when replacing the tailpipe, cut between the main silencer and tailpipe.

Cut Location



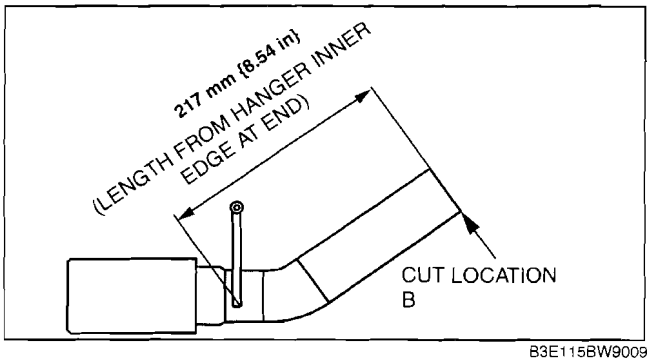
B3E115BW9003

Caution
- **Be careful not to deform the pipe when cutting. If the pipe is deformed, the new pipe may not be installed correctly.**

1. Cut the pipe between the main silencer and tailpipe using the following procedure. (Cut location B)

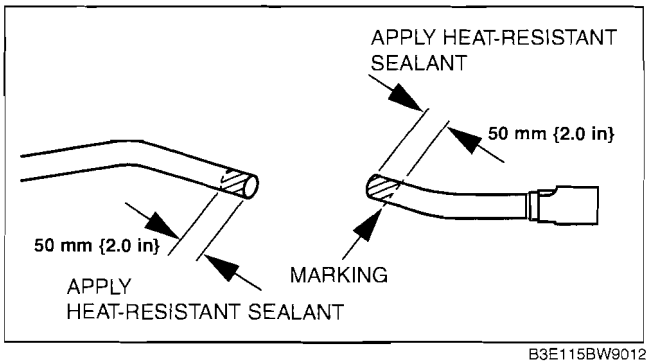
Note
- Perform measurement parallel to the pipe being cut.

(1) Measure the length from the hanger inner edge at the end.
(2) Cut the pipe at the specified location.
2. Remove burrs from the cut surface on the main silencer side using a round file.



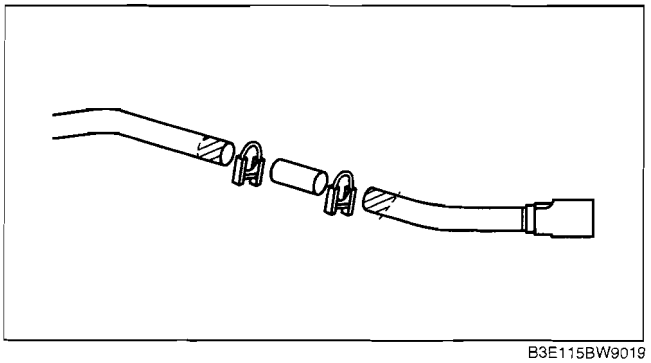
B3E115BW9009

3. Install the new tailpipe to the main silencer using the following procedure. (Cut location B)
   (1) Measure the indicated length from the cut surface of the new tailpipe to the marking.
   (2) Apply heat-resistant sealant to the specified position along the complete perimeter.



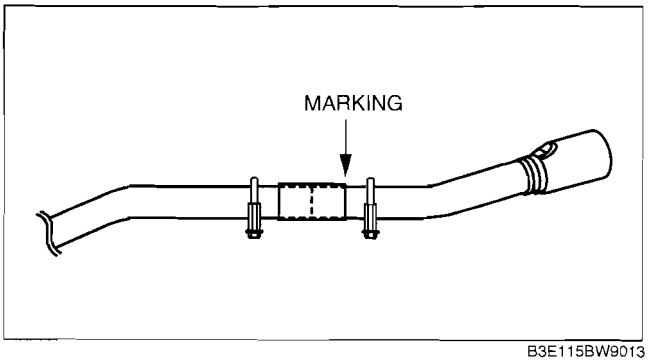
B3E115BW9012

   (3) Insert the U-shaped bolt.
   (4) Insert the joint pipe to the main silencer.
   (5) Insert the tailpipe to the joint pipe.
   (6) Secure the exhaust pipe to the rubber hanger.



B3E115BW9019

   (7) Align the cut surface of the joint pipe with the marking.
   (8) Verify that the exhaust pipe is installed without any bends or strain on the pipe.

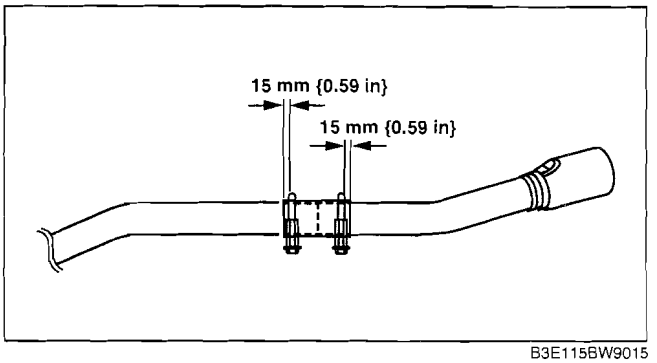


B3E115BW9013

4. Tighten the U-shaped bolt between the main silencer and the new tailpipe using the following procedure. (Cut location B)

Note
- The joint pipe has a marked line at the specified position where the U-shaped bolt is to be set.

(1) Set the U-shaped bolt in the specified position.



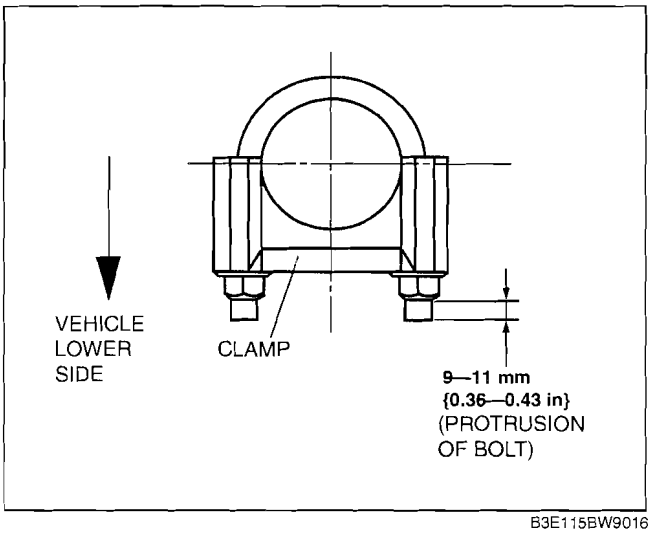
B3E115BW9015

(2) Set the U-shaped bolt so that it faces the vehicle lower side.

Caution
- **Do not loosen U-shaped bolt after tightening. If it is loosened, the bolt cannot be tightened at the specified torque with the specified protrusion.**
- **Tighten the U-shaped bolt in three or four steps, left and right equally, to prevent clamp deformation.**

Note
- Tighten the U-shaped bolt on the main silencer side first, then the tailpipe side.

(3) Tighten the U-shaped bolt on the main silencer side.



B3E115BW9016

Protrusion of U-shaped bolt after tightening
9—11 mm {0.36—0.43 in}

(4) Gradually tighten the U-shaped bolt on the tailpipe side verifying that the tailpipe end is at the center of the bumper as viewed from behind the vehicle.

Protrusion of U-shaped bolt after tightening
9—11 mm {0.36—0.43 in}

01-15B EXHAUST SYSTEM [L3 WITH TC]

EXHAUST SYSTEM INSPECTION[L3 WITH TC]

id011539800100

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
   - If there is leakage, repair or replace if necessary.

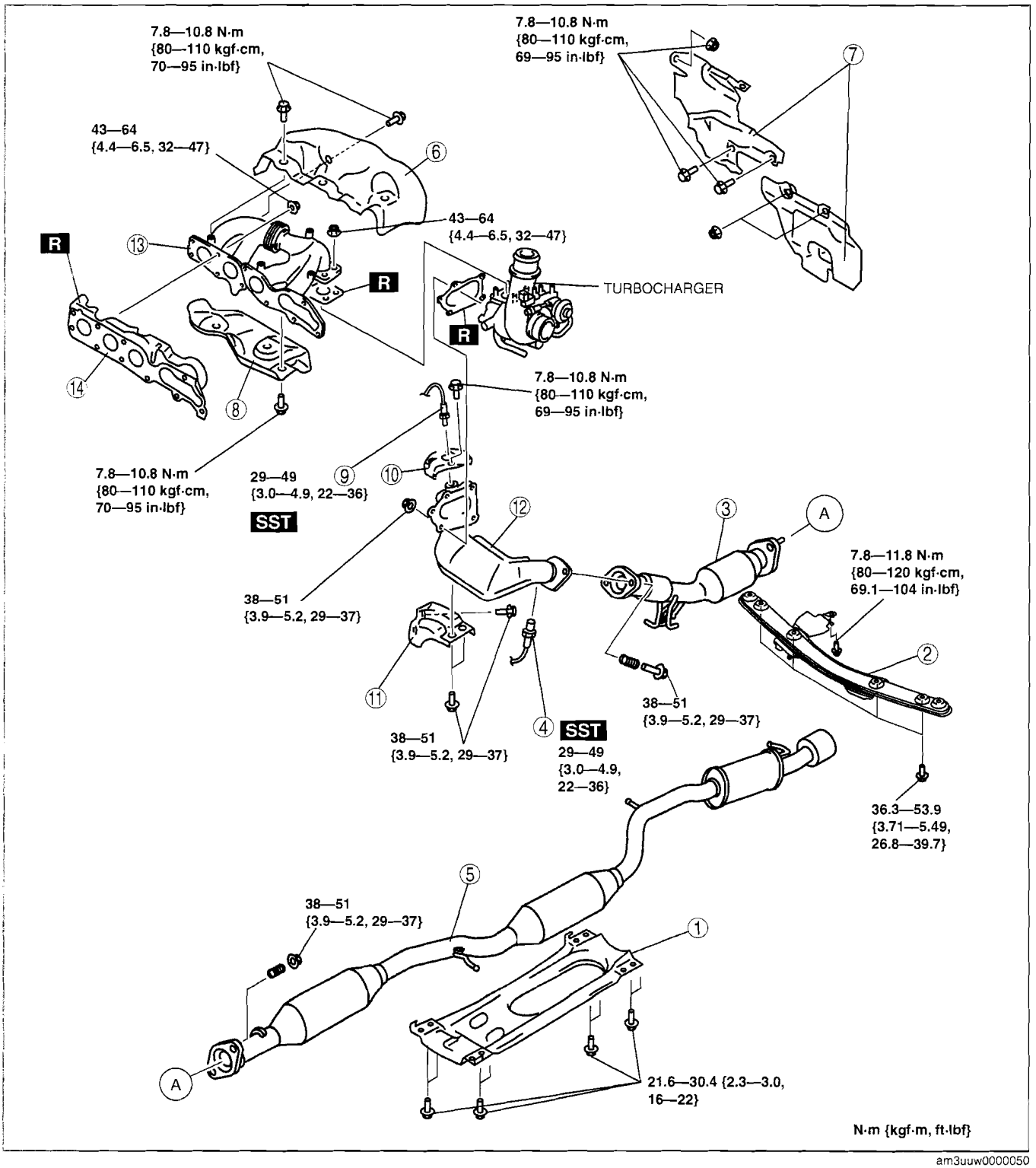
EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC]

id011539800200

Warning

- **A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before removing the exhaust system.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

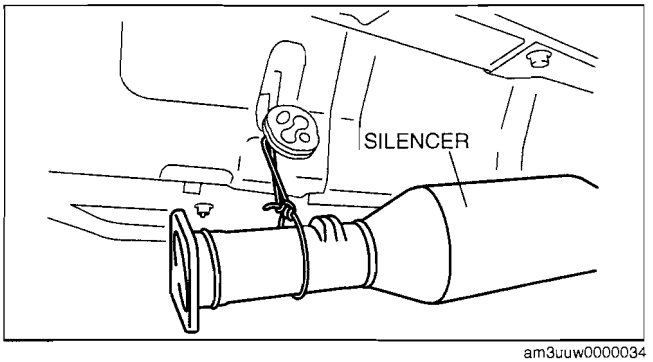


am3uuw0000050

1	Tunnel member
2	Member
3	TWC (See 01-15B-3 TWC Removal Note)
4	Rear HO2S (See 01-15B-3 HO2S Removal Note)
5	Silencer (See 01-15B-3 Silencer Removal Note)
6	Exhaust manifold insulator (Upper) (See 01-15B-3 Silencer Removal Note)
7	Insulator
8	Exhaust manifold insulator (Lower)
9	Front HO2S (See 01-15B-3 HO2S Removal Note)
10	WU-TWC insulator
11	WU-TWC bracket
12	WU-TWC (See 01-15B-3 Exhaust Manifold Insulator (Upper) Removal Note)
13	Exhaust manifold (See 01-15B-4 WU-TWC Installation Note)
14	Exhaust manifold gasket

TWC Removal Note

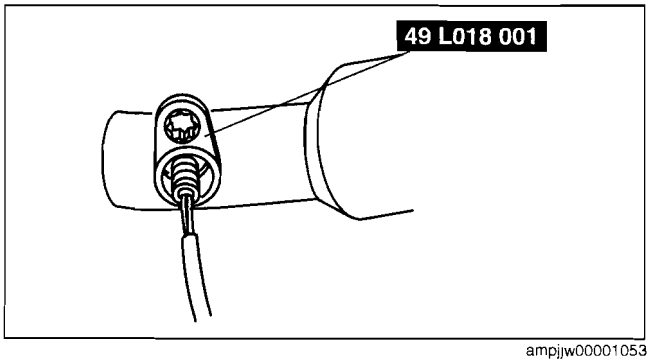
1. Disconnect the hanger rubber except for the one installed to the rear end of the vehicle from the silencer, and suspend the silencer using rope.
2. Remove the TWC.



am3uuw0000034

HO2S Removal Note

1. Remove the HO2S using the **SST** before removing the exhaust manifold.



ampjjw00001053

Silencer Removal Note

1. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
2. Loosen the rear crossmember component installation bolts (6 locations) and lower the rear crossmember component **approx. 70 mm {2.8 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
3. Remove the main silencer.

Exhaust Manifold Insulator (Upper) Removal Note

1. Remove the charge air cooler bracket.
2. Remove the exhaust manifold insulator (upper)

WU-TWC Installation Note

1. Temporarily tighten No.1 shown in the figure.
2. Temporarily tighten No.2 shown in the figure.
3. Temporarily tighten No.3 shown in the figure.
4. Completely tighten No.1 shown in the figure.

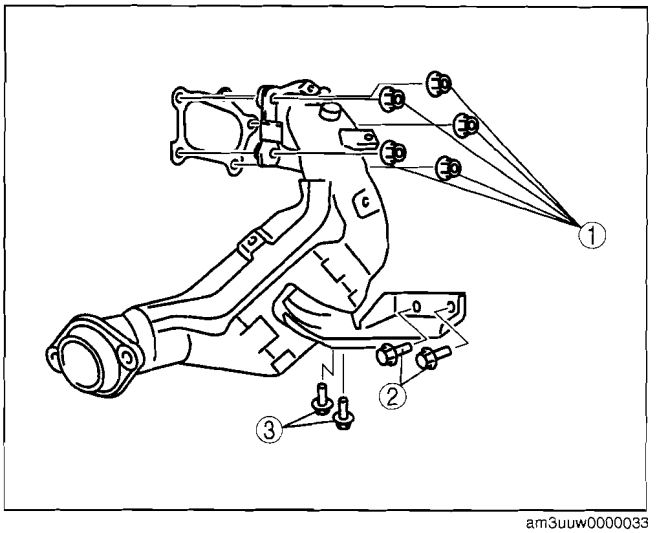
   Tightening torque
   38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

5. Completely tighten No.2 shown in the figure.

   Tightening torque
   38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

6. Completely tighten No.3 shown in the figure.

   Tightening torque
   38—51 N·m {3.9—5.2 kgf·m, 29—37 ft·lbf}

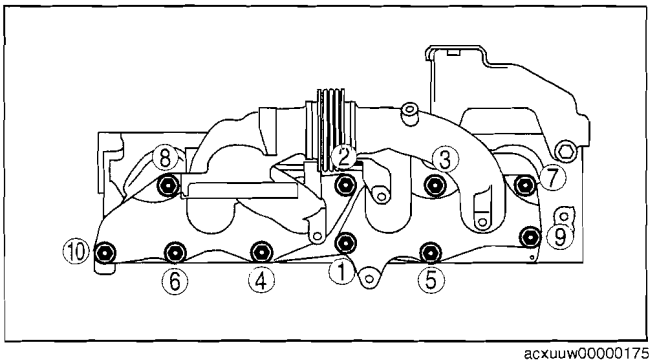


am3uuw0000033

Exhaust Manifold Installation Note

1. Tighten the exhaust manifold installation nuts in the order shown.

   Tightening torque
   43—64 N·m {4.4—6.5 kgf·m, 32—47 ft·lbf}



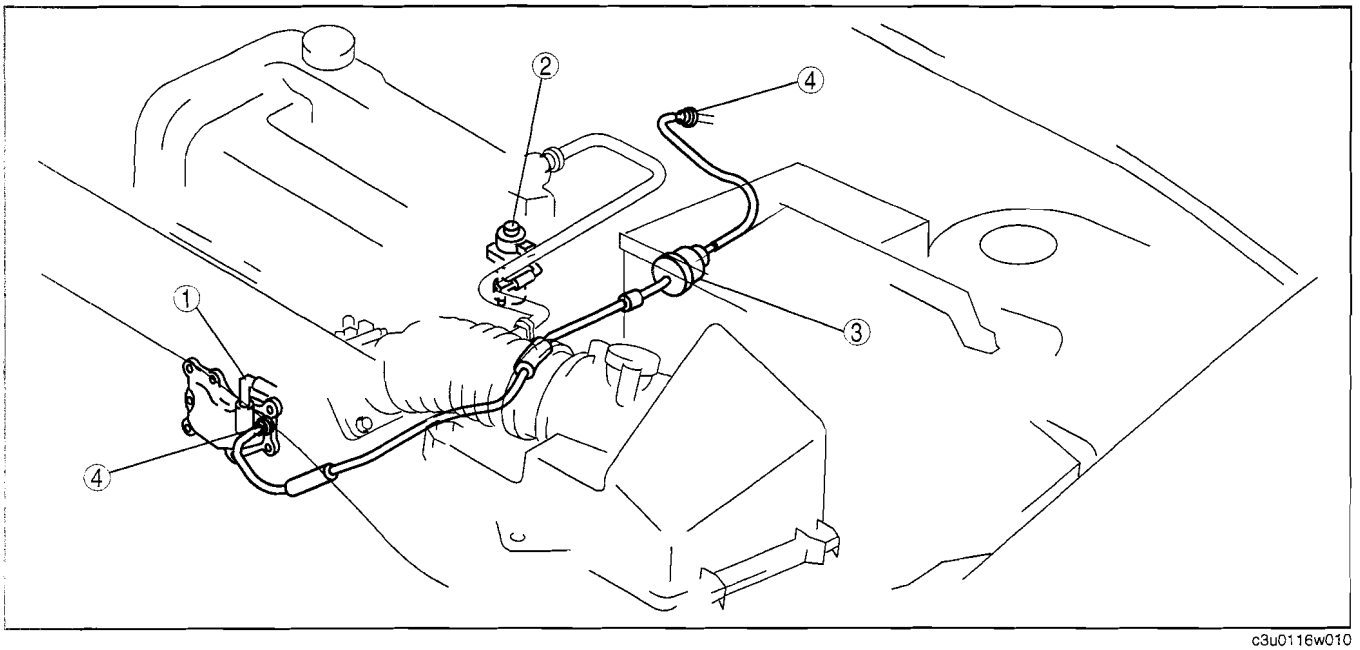
acxuuw00000175

01-16A EMISSION SYSTEM [LF, L3]

EMISSION SYSTEM LOCATION INDEX[LF, L3]

id0116a5803700

Engine Compartment Side

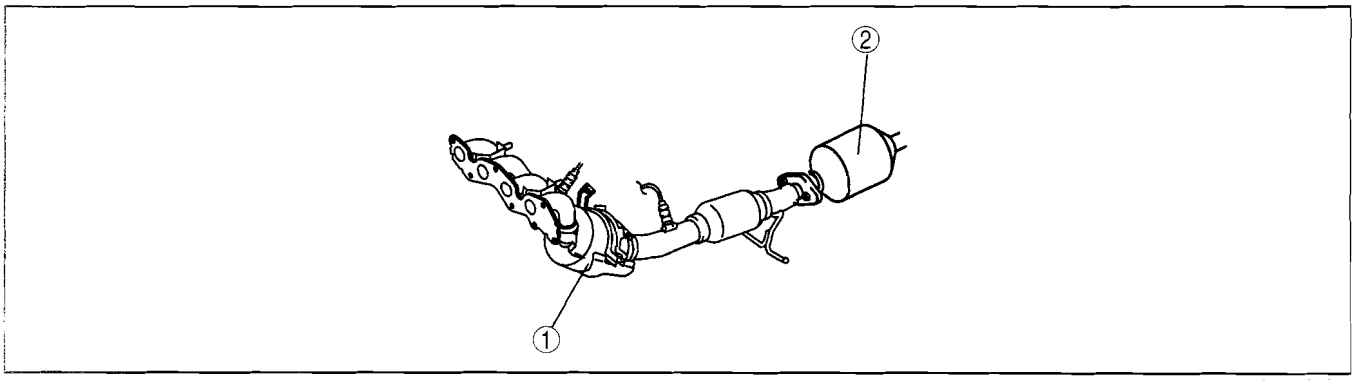


c3u0116w010

1	Positive crankcase ventilation (PCV) valve (See 01-16A-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3].)
2	EGR valve (See 01-16A-13 EGR VALVE REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-14 EGR VALVE INSPECTION[LF, L3].)

3	Purge solenoid valve (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3].) (See 01-16A-13 PURGE SOLENOID VALVE INSPECTION[LF, L3].)
4	Quick release connector (Type A) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)

Exhaust System

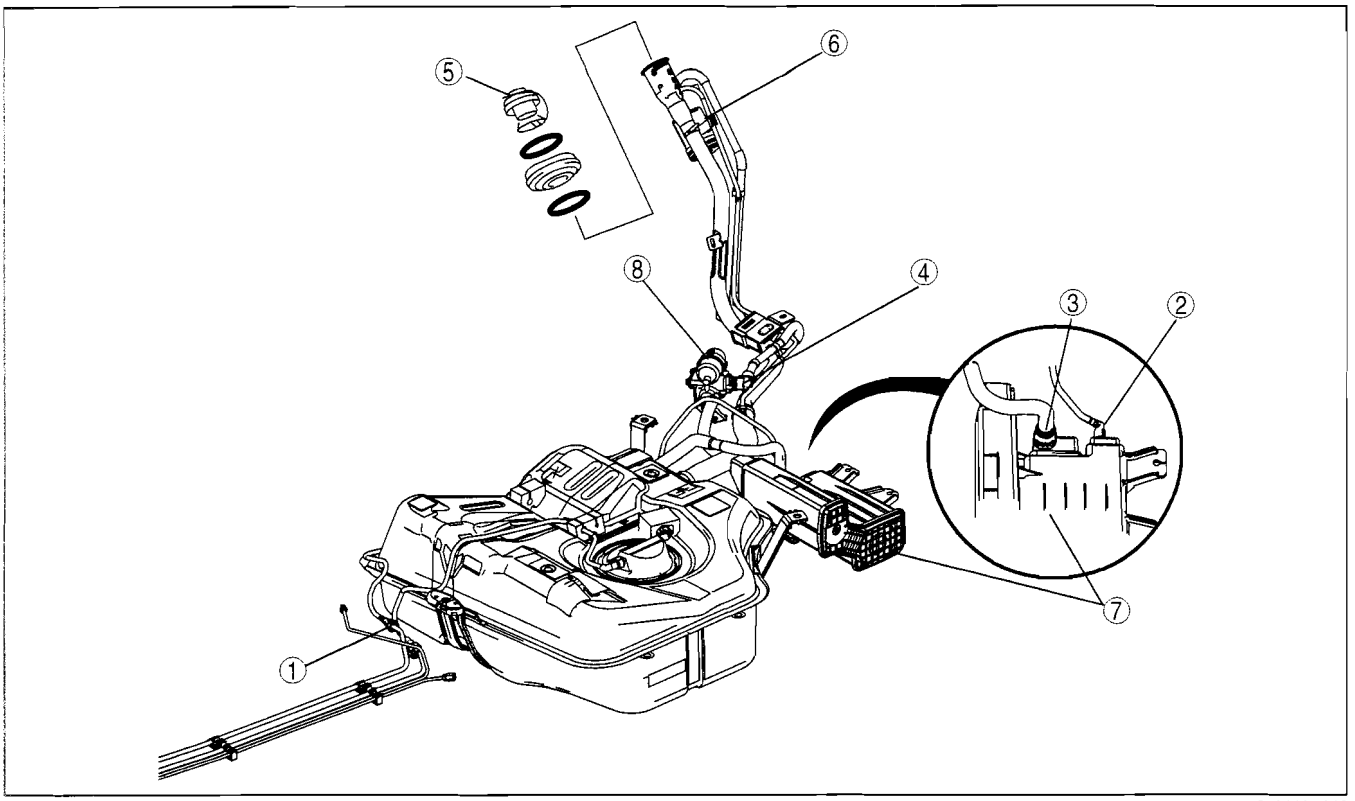


c3u0116w015

1	WU-TWC (See 01-16A-15 WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[LF, L3].)

2	TWC

Fuel Tank Side
California emission regulation applicable model

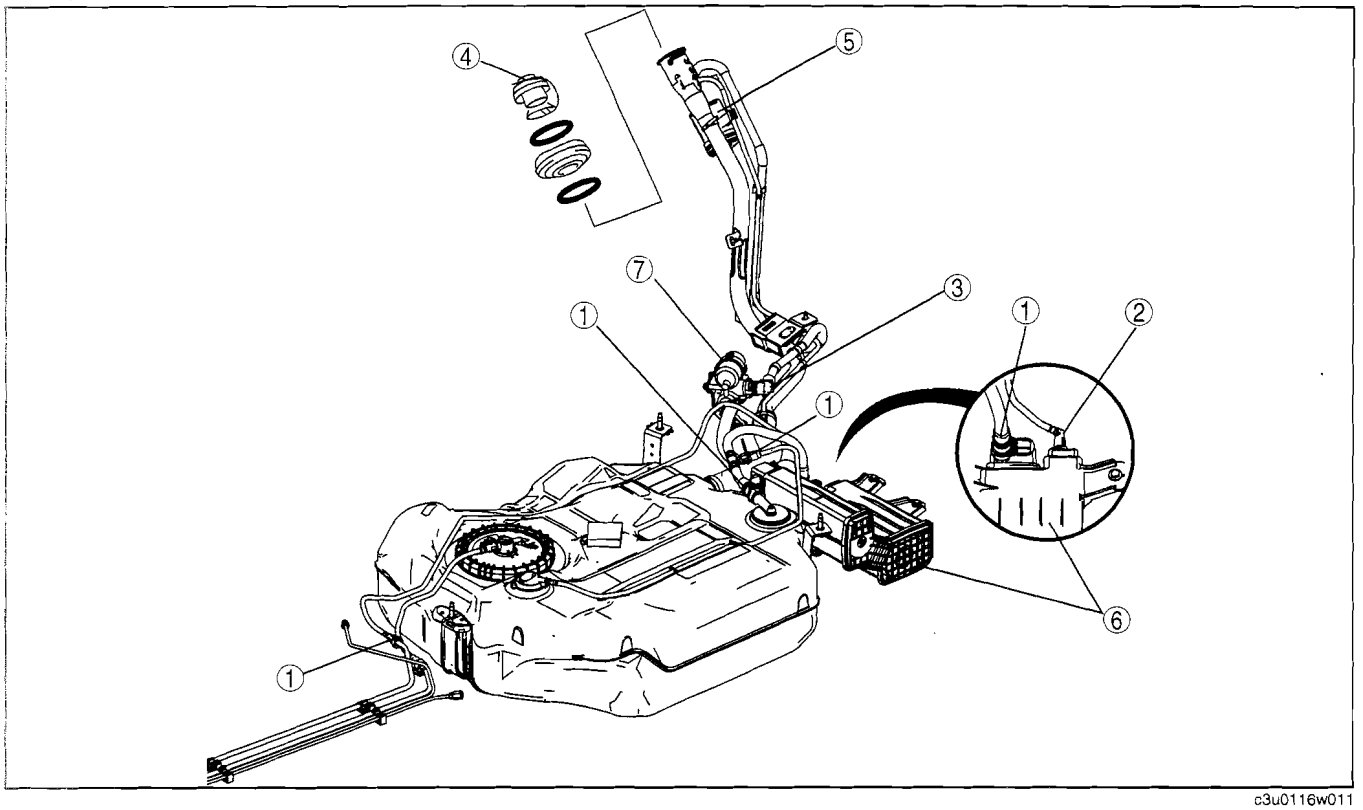


c3u0116w012

1	Quick release connector (Type B) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
2	Quick release connector (Type C) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
3	Quick release connector (Type D) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
4	Quick release connector (Type E) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)

5	Fuel-filler cap (See 01-16A-5 FUEL-FILLER CAP INSPECTION[LF, L3].)
6	Air filter (See 01-16A-7 AIR FILTER REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-7 AIR FILTER INSPECTION[LF, L3].)
7	Charcoal canister (See 01-16A-7 CHARCOAL CANISTER REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-9 CHARCOAL CANISTER INSPECTION[LF, L3].)
8	EVAP system leak detection pump (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-10 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3].)

Except for California emission regulation applicable model



c3u0116w011

1	Quick release connector (Type B) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
2	Quick release connector (Type C) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
3	Quick release connector (Type E) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
4	Fuel-filler cap (See 01-16A-5 FUEL-FILLER CAP INSPECTION[LF, L3].)

5	Air filter (See 01-16A-7 AIR FILTER REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-7 AIR FILTER INSPECTION[LF, L3].)
6	Charcoal canister (See 01-16A-7 CHARCOAL CANISTER REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-9 CHARCOAL CANISTER INSPECTION[LF, L3].)
7	EVAP system leak detection pump (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[LF, L3].) (See 01-16A-10 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3].)

FUEL-FILLER CAP INSPECTION[LF, L3]

id0116a5801300

Leakage Inspection

1. Perform the following **SST** (Evaporative Emission System Tester 134-01049) self-test:

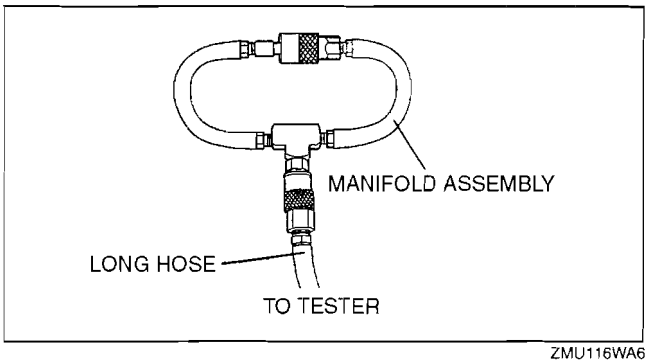
Note

- If the tester does not work correctly during self-test, refer to the tester operators manual for more detailed procedures.

(1) Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester display should be off at this time.
(2) Connect the long hose (part of **SST**) to the tester.
(3) Connect the manifold assembly (part of **SST**) to the long hose as shown.
(4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
- If not, refer to the tester operators manual to contact tester manufacturer.

(5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.
(6) Turn the control valve on the tester to the FILL position.
(7) Verify the left display reading is **within 13.9 to 14.0 in of water**.
- If not, adjust the pressure using the regulator knob located on the right side of the tester.

(8) Turn the control valve to TEST position and press the START switch.
(9) After the **2-min** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 in of water** loss is acceptable on the self-test.
- If the loss is **more than 0.5 in of water**, do one or more self-test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).



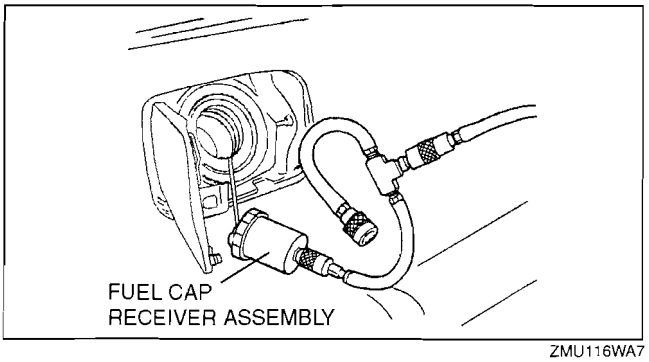
ZMU116WA6

2. Press the RESET switch to set the left display reading to **0.0**.
3. Connect the fuel cap receiver assembly (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.
- If the fuel-filler cap is not a genuine part, replace it.

4. Turn the control valve to the FILL position.
5. Wait (**maximum 20 s**) until the left display reads **13.9 to 14 in** of water.
- If the reading is slightly below, adjust it using the regulator knob.
- If the reading is far below, the fuel-filler cap has leak. Replace it.

6. Turn the control valve to the TEST position and press the START switch.
7. After the **2-min** countdown (left display) is completed, check the test result (the failed/passed light on the tester).
- If the green light turns on, the fuel-filler cap is OK.
- If the red light turns on, the fuel-filler cap has leakage. Replace it.

8. Close the gas cylinder valve.
9. Turn the control valve to the FILL position.
10. Press the ON/OFF switch to turn off the tester.

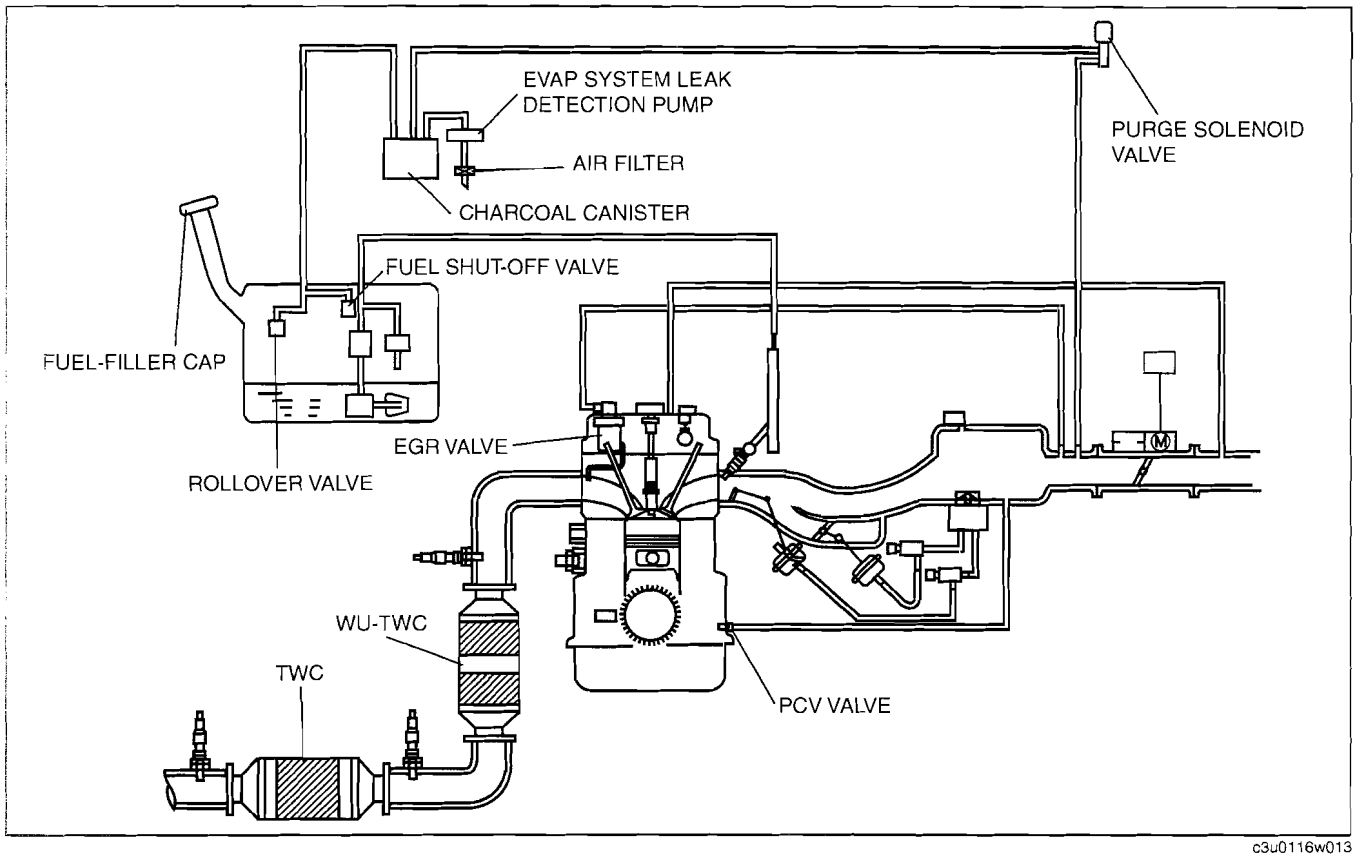


ZMU116WA7

EMISSION SYSTEM DIAGRAM[LF, L3]

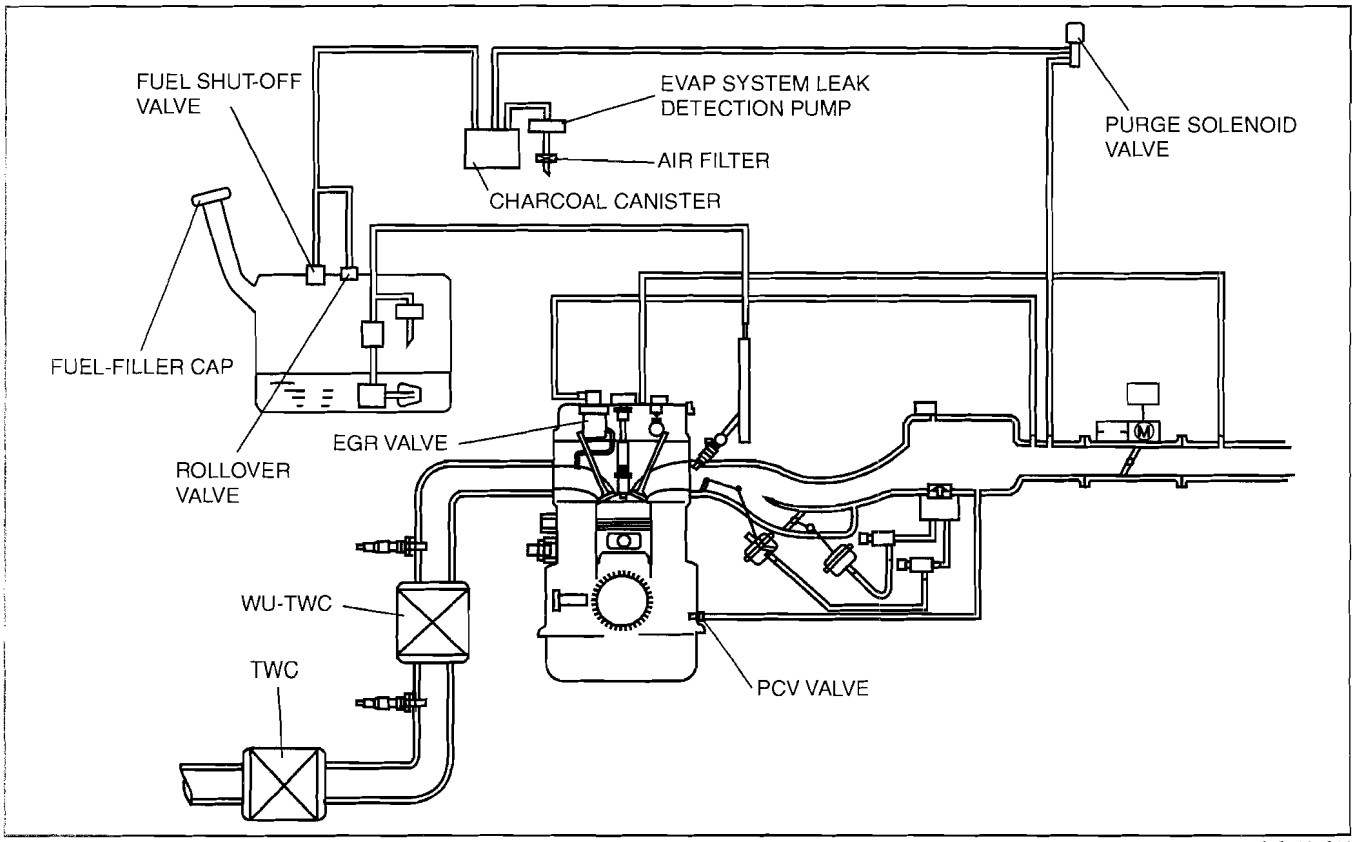
id0116a5803600

California emission regulation applicable model



c3u0116w013

Except for California emission regulation applicable model

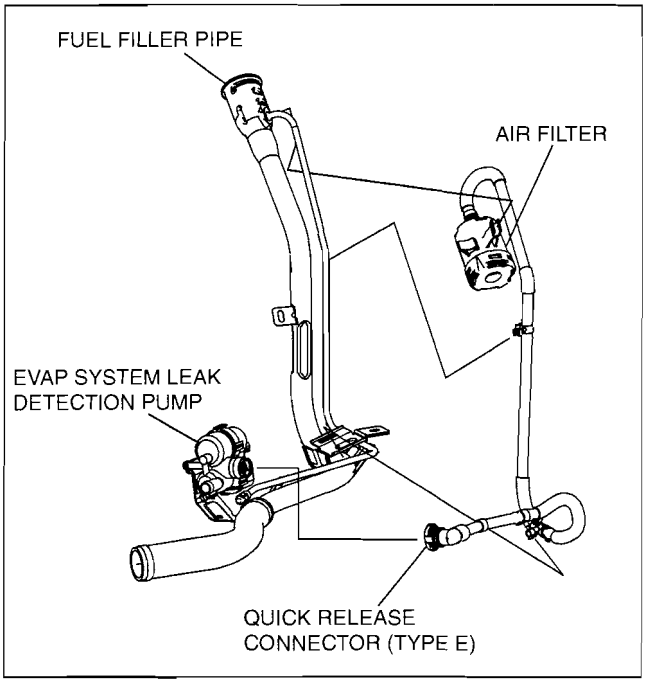


c3u0116w014

AIR FILTER REMOVAL/INSTALLATION[LF, L3]

id0116a5809500

1. Remove the rear tire (RH).
2. Remove the rear mudguard (RH).
3. Support the rear crossmember using a transmission jack.
4. Remove the rear shock absorber (RH) lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
5. Loosen the rear crossmember installation nuts (6 locations) and lower the rear crossmember **30 mm {1.2 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
6. Remove the fuel-filler cap.
7. Remove the Air filter.
8. Install in the reverse order of removal.

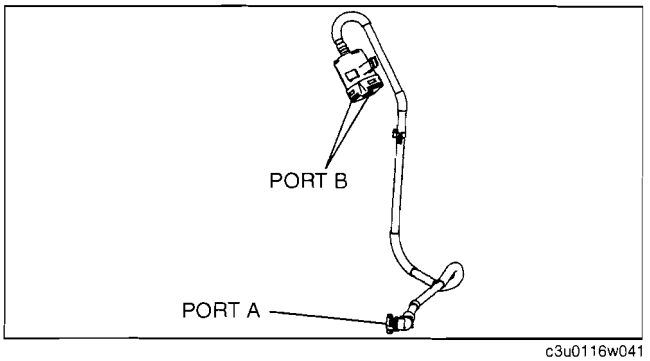


c3u0116w500

AIR FILTER INSPECTION[LF, L3]

id0116a5800600

1. Remove the air filter. (See 01-16A-7 AIR FILTER REMOVAL/INSTALLATION[LF, L3].)
2. Blow from port A and verify that there is airflow from port B.
   - If not as specified, replace the air filter.
3. Blow from port B and verify that there is airflow from port A.
   - If not as specified, replace the air filter. (See 01-16A-7 AIR FILTER REMOVAL/INSTALLATION[LF, L3].)

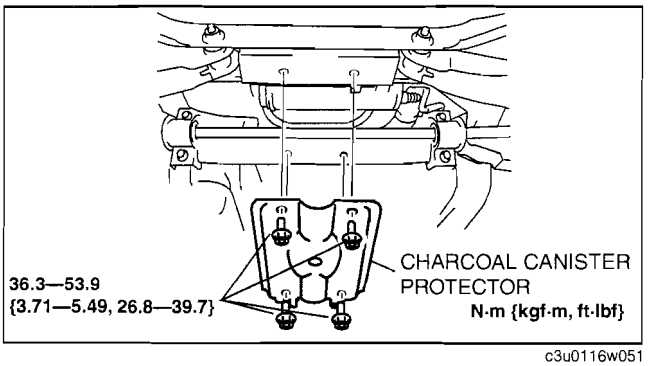


c3u0116w041

CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3]

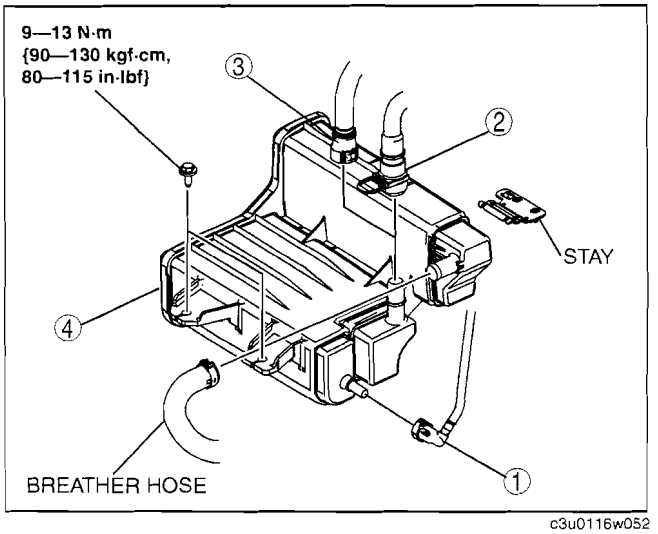
id0116a5801500

1. Remove the charcoal canister protector.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



c3u0116w051

4. Verify that the rear wheel alignment is within the specification. (See 02-11-4 REAR WHEEL ALIGNMENT.).

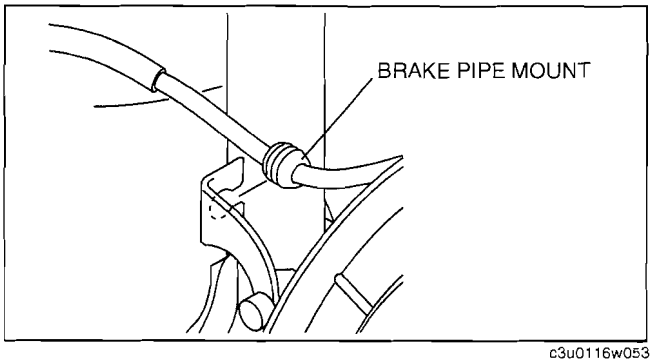


c3u0116w052

1	Quick connector (Type C) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
2	Quick connector (Type B) [Except for California regulation emission applicable model] (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
3	Quick connector (Type D) [For California regulation emission applicable model] (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
4	Charcoal canister (See 01-16A-8 Charcoal Canister Removal Note.) (See 01-16A-8 Charcoal Canister Installation Note.)

Charcoal Canister Removal Note

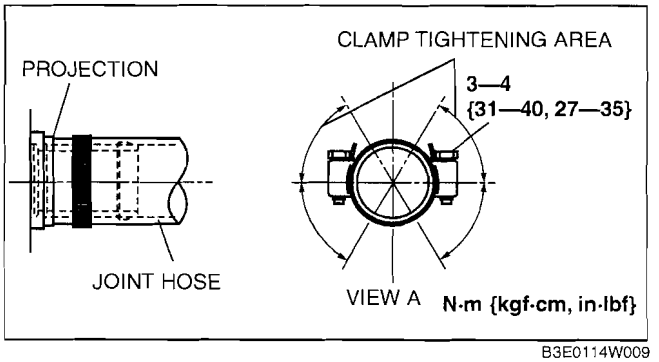
1. Support the rear crossmember using a transmission jack.
2. Remove the rear wheels.
3. Disconnect the ABS wheel-speed sensor wiring harness connector.
4. Disengage the brake pipe mount from bracket.
5. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
6. Loosen the rear crossmember installation nuts (6 locations) and lower the rear crossmember **approx. 140 mm {5.5 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
7. Disconnect the breather hose.
8. Remove the installation bolts and remove the charcoal canister.



c3u0116w053

Charcoal Canister Installation Note

1. Fit the charcoal canister into the stay.
2. Install the breather hose and clamp as shown in the figure.

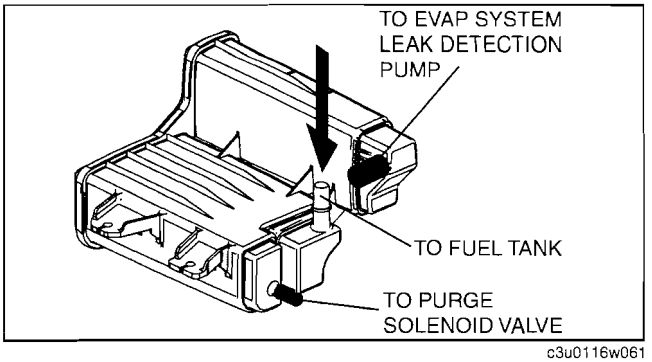


B3E0114W009

CHARCOAL CANISTER INSPECTION[LF, L3]

id0116a5800500

1. Remove the charcoal canister. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].)
2. Plug the EVAP leak detection pump side and purge solenoid valve side of the charcoal canister.
3. Inspect for air leakage when blowing air by mouth from the fuel tank side.
   - If air leaks, replace the charcoal canister. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].)

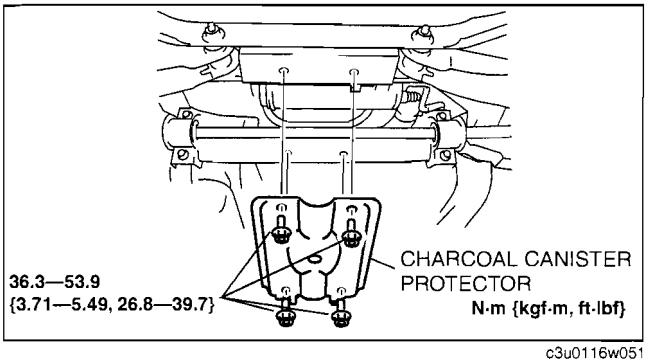


c3u0116w061

EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3]

id0116a5800700

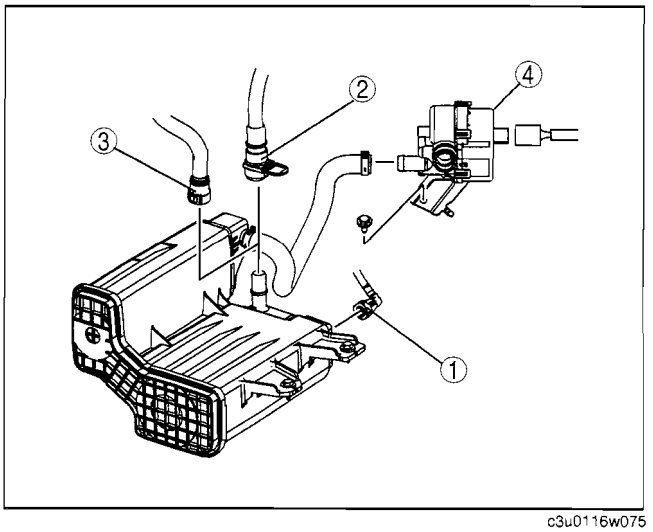
1. Remove the charcoal canister protector.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



c3u0116w051

4. Verify that the rear wheel alignment is within the specification. (See 02-11-4 REAR WHEEL ALIGNMENT.)

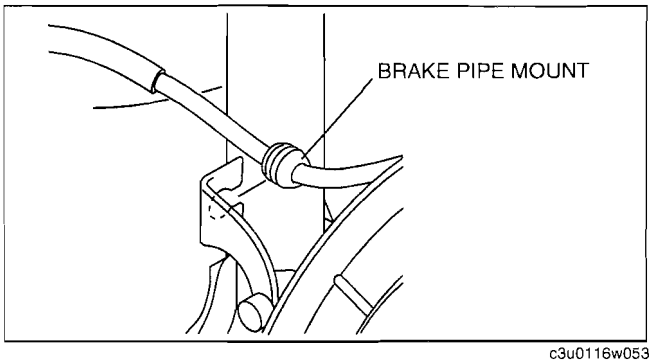
1	Quick connector (Type C) (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
2	Quick connector (Type B) [Except for California regulation emission applicable model] (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
3	Quick connector (Type D) [For California regulation emission applicable model] (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/ INSTALLATION[LF, L3].)
4	EVAP system leak detection pump (See 01-16A-10 EVAP System Leak Detection Pump Removal Note.) (See 01-16A-10 EVAP System Leak Detection Pump Installation Note.)



c3u0116w075

EVAP System Leak Detection Pump Removal Note

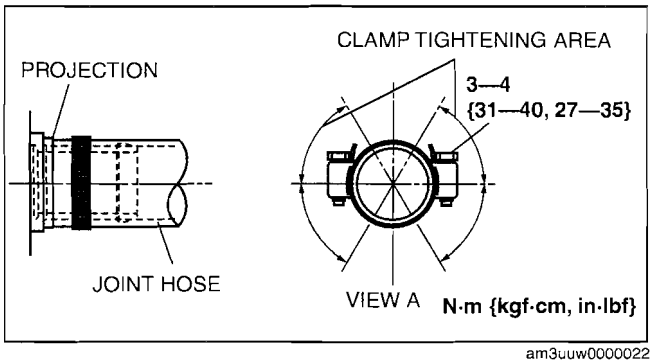
1. Support the rear crossmember using a transmission jack.
2. Remove the rear wheels.
3. Disconnect the ABS wheel-speed sensor wiring harness connector.
4. Disengage the brake pipe mount from bracket.
5. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
6. Loosen the rear crossmember installation nuts (6 locations) and lower the rear crossmember **approx. 140 mm {5.5 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
7. Disconnect the breather hose.
8. Remove the installation bolt and remove the EVAP system leak detection pump.



c3u0116w053

EVAP System Leak Detection Pump Installation Note

1. Install the breather hose and clamp as shown in the figure.



am3uuw0000022

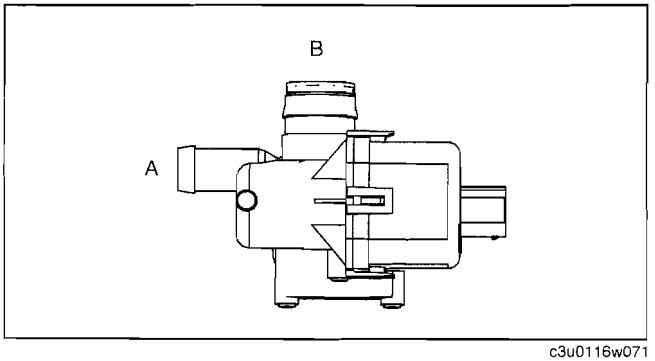
EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[LF, L3]

id0116a5800800

Airflow Inspection

Note
- Perform the following test only when directed.

1. Remove the EVAP system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].)
2. Blow air into port A and verify that there is airflow from port B.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].)
3. Blow air into port B and verify that there is airflow from port A.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].)
   - If as specified, perform the following "Resistance Inspection".



c3u0116w071

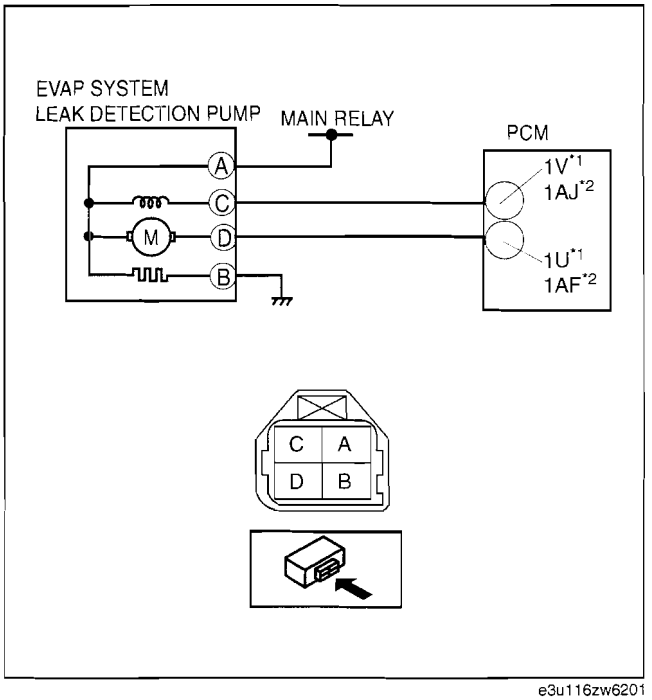
Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Inspect resistance of the EVAP system leak detection pump.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].)
   - If as specified, carry out the "Circuit Open/Short Inspection".

Terminals	Resistance (ohm)
A—B	20—50
A—C	26.6—32.4
A—D	MAX. 118

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3
*2 : Except for California emission regulation applicable model with LF ATX

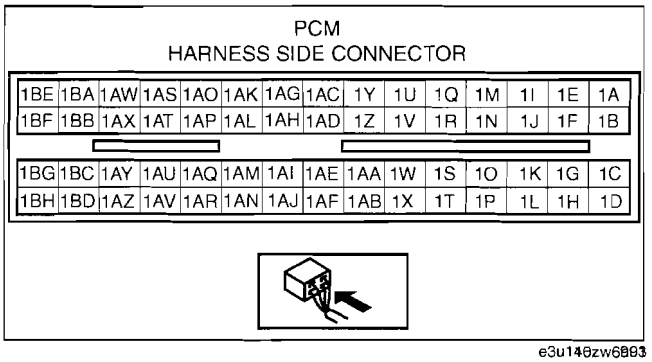


e3u116zw6201

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harness for open or short circuit (continuity check).

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal C and PCM terminal 1V*1, 1AJ*2
  - — EVAP system leak detection pump terminal D and PCM terminal 1U*1, 1AF*2
  - — EVAP system leak detection pump terminal A and main relay terminal A
  - — EVAP system leak detection pump terminal B and the body ground



e3u146zw6893

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal A and the body ground
  - — EVAP system leak detection pump terminal B and power supply
  - — EVAP system leak detection pump terminal C and power supply
  - — EVAP system leak detection pump terminal D and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3
*2 : Except for California emission regulation applicable model with LF ATX

PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3]

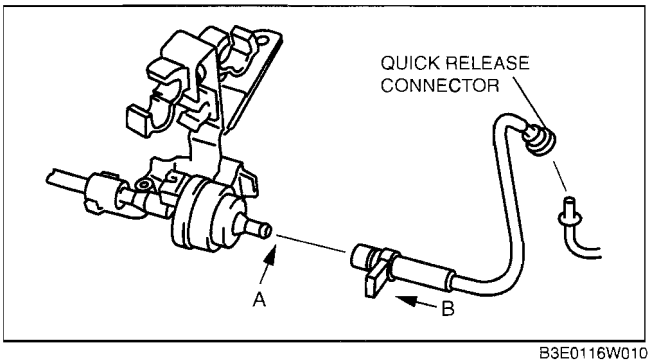
id0116a5803500

1. Remove the plug hole plate.
2. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Remove using the following procedure:

Caution

- **Do not disconnect the purge solenoid valve and evaporative hose except when replacing the purge solenoid valve because it may cause evaporative gas leakage. When it is necessary to remove the purge solenoid valve for removing/installing other parts, disconnect the valve at the quick release connector.**

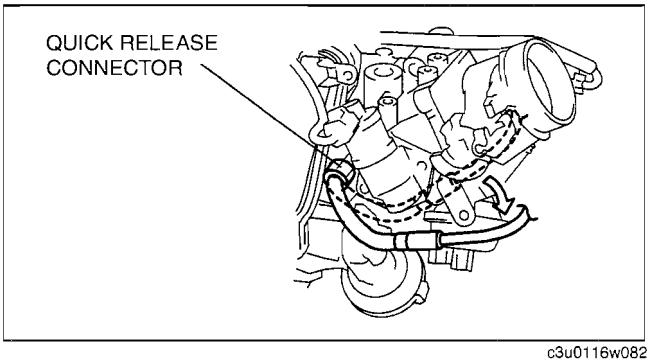
(1) Disconnect the evaporative hose at the charcoal canister side. (See 01-16A-12 Evaporative Hose Installation Note.)



B3E0116W010

(2) Turn the evaporative hose (intake manifold side) approx. 30° from the dot line to the solid line.
(3) Disconnect the quick release connector (Type A). (See 01-16A-16 QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3].)

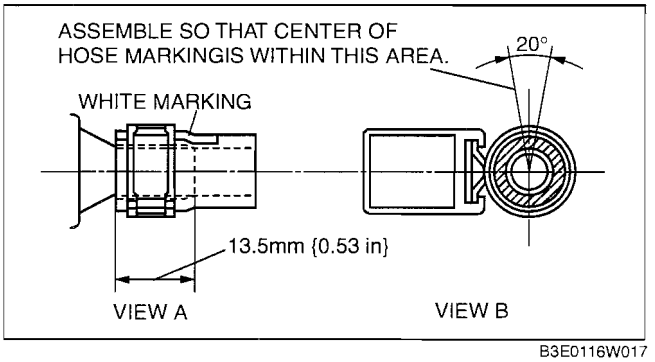
5. Install in the reverse order of removal.



c3u0116w082

Evaporative Hose Installation Note

1. Install the evaporative hose and clamp as shown in the figure.



B3E0116W017

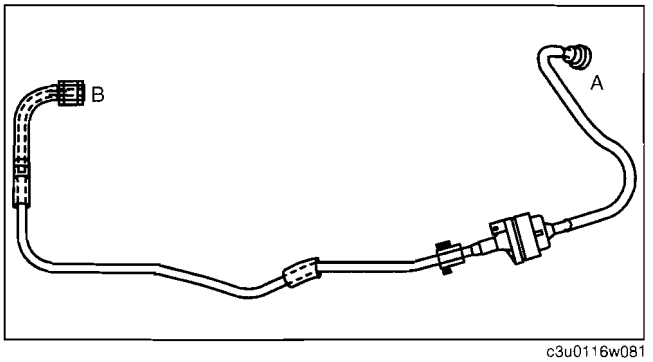
PURGE SOLENOID VALVE INSPECTION[LF, L3]

id0116a5800900

Airflow Inspection

1. Remove the purge solenoid valve without disconnecting the evaporative hose. (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3].)
2. Verify that the airflow is as indicated in the table.
   - If as specified in the table, perform the "Circuit Open/Short Inspection".
   - If not as specified in the table, inspect the purge solenoid valve. (See 01-16A-12 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[LF, L3].)

Measured condition	Continuity between A—B
When voltage is not applied between terminals A and B	No airflow
When voltage is applied between terminals A and B	Airflow detected



c3u0116w081

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

Open circuit

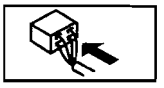
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A and PCM terminal 2C*1, 2AN*2
  - — Purge solenoid valve terminal B and main relay terminal A

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A and body ground

PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



E6SU1102W6003

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

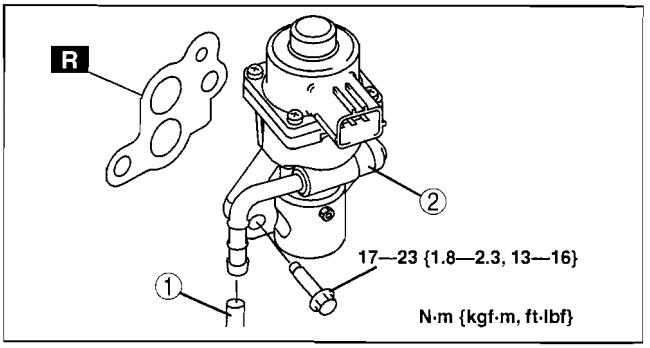
*2 : Except for California emission regulation applicable model with LF ATX

EGR VALVE REMOVAL/INSTALLATION[LF, L3]

id0116a5801000

1. Remove the plug hole plate.
2. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Disconnect the EGR valve connector.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.

1	Water hose (See 01-16A-14 Water Hose Removal Note.)
2	EGR valve (See 01-16A-14 EGR Valve Removal Note.)



c3u0116w021

Water Hose Removal Note

1. Drain the engine coolant from the radiator. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)

EGR Valve Removal Note

1. Remove the air cleaner and air hose. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3],)
2. Remove the radiator hose (upper). (See 01-12A-6 RADIATOR REMOVAL/INSTALLATION[LF, L3].)

EGR VALVE INSPECTION[LF, L3]

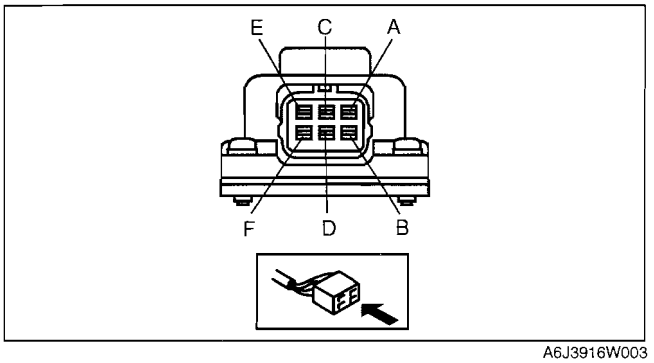
id0116a5801100

On-vehicle Inspection

1. Verify that the buzzing sound (valve operation sound) is heard from the EGR valve when engine cranking.
   - If the buzzing sound is not heard, perform the resistance inspection.

Resistance Inspection

1. Disconnect the EGR valve connector. (See 01-16A-13 EGR VALVE REMOVAL/INSTALLATION[LF, L3].)
2. Measure the resistance between the EGR valve terminals.
   - If within the specification, perform out the "Circuit Open/Short Inspection".
   - If not within the specification, replace the EGR valve. (See 01-16A-13 EGR VALVE REMOVAL/INSTALLATION[LF, L3].)



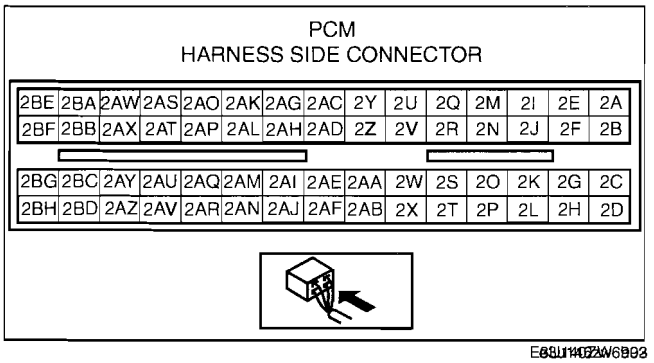
A6J3916W003

Standard

Terminal	Resistance (ohm)
C—E C—A D—B D—F	12—16

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



E6U1402W6903

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EGR valve terminal A and PCM terminal 2G[*1], 2AR[*2]
  - — EGR valve terminal B and PCM terminal 2L[*1], 2AY[*2]
  - — EGR valve terminal E and PCM terminal 2K[*1], 2AU[*2]
  - — EGR valve terminal F and PCM terminal 2H[*1], 2AV[*2]
  - — EGR valve terminal C and main relay terminal A
  - — EGR valve terminal D and main relay terminal A

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EGR valve terminal A and body ground
  - — EGR valve terminal B and body ground
  - — EGR valve terminal E and body ground
  - — EGR valve terminal F and body ground

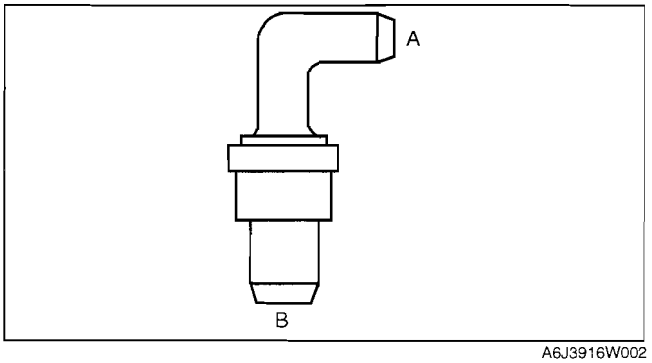
*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

*2 : Except for California emission regulation applicable model with LF ATX

POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[LF, L3]

id0116a5800400

1. Remove the intake manifold.
2. Remove the PCV valve.
3. Verify that there is no airflow when pressure is applied to port A.
   - If there is airflow, replace the PCV valve.
4. Verify that there is airflow when vacuum is applied to port A.
   - If there is no airflow, replace the PCV valve.



A6J3916W002

WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[LF, L3]

id0116a5801200

Caution
- **Perform the following procedures, DTC P0421 is indicated only.**

1. Connect the M-MDS to the DLC-2.
2. Start the engine and warm it up to normal operating temperature.
3. Turn off the engine.
4. Verify that the engine compression is within the specification. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)
   - If the compression pressure is not within the specification, repair or replace the malfunction part.
5. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to allow the front catalytic converter to reach operating temperature.
6. Stop the vehicle and leave it in a safe space.
7. Access Test ID 10:21:80 on the "Diagnostic Monitoring Test Result" function.
8. Verify that the test result is within the specified indicated on the M-MDS.
   - If it is not as specified, replace the front catalytic converter.

ROLLOVER VALVE REMOVAL/INSTALLATION[LF, L3]

id0116a5804600

Note
- Except for the California emission regulation applicable model, the rollover valve cannot be removed as it is welded on the upper surface of the fuel tank.
- For the California emission regulation applicable model, the rollover valve cannot be removed as it is built into the fuel tank.

ROLLOVER VALVE INSPECTION[LF, L3]

id0116a5804500

Note
- Except for the California emission regulation applicable model, the rollover valve cannot be removed and inspected as it is welded on the upper surface of the fuel tank.
- For the California emission regulation applicable model, the rollover valve cannot be removed and inspected as it is built into the fuel tank.

1. Perform the fuel tank inspection. (See 01-14A-12 FUEL TANK INSPECTION[LF, L3].)

FUEL SHUT-OFF VALVE REMOVAL/INSTALLATION[LF, L3]

id0116a5809600

Note
- Except for the California emission regulation applicable model, the fuel shut-off valve cannot be removed as it is welded on the upper surface of the fuel tank.
- For the California emission regulation applicable model, the fuel shut-off valve cannot be removed as it is built into the fuel tank.

FUEL SHUT-OFF VALVE INSPECTION[LF, L3]

id0116a5809700

Note

- Except for the California emission regulation applicable model, the fuel shut-off valve cannot be removed and inspected as it is welded on the upper surface of the fuel tank.
- For the California emission regulation applicable model, the fuel shut-off valve cannot be removed and inspected as it is built into the fuel tank.

1. Perform the fuel tank inspection. (See 01-14A-12 FUEL TANK INSPECTION[LF, L3].)

QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION[LF, L3]

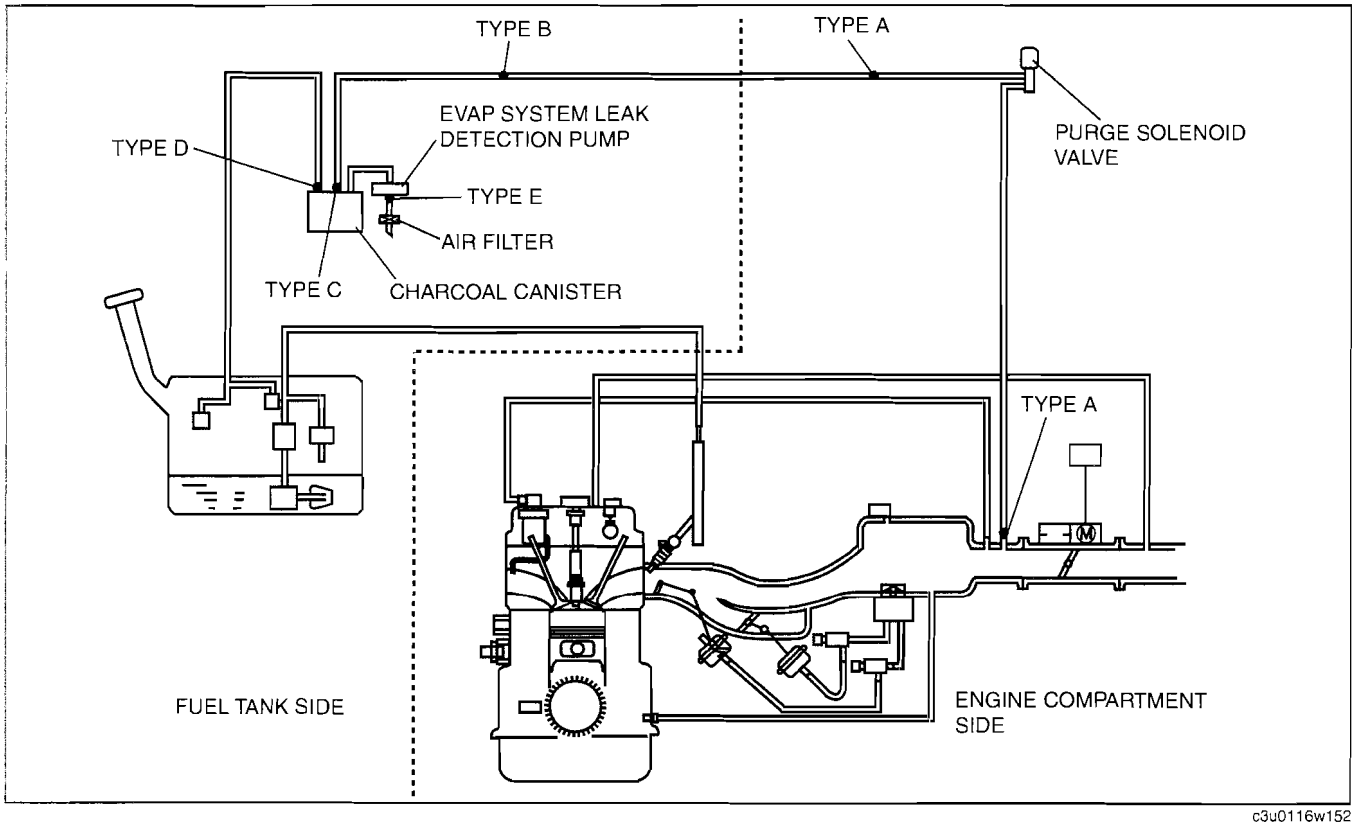
id0116a5805500

Quick Release Connector Type

Caution

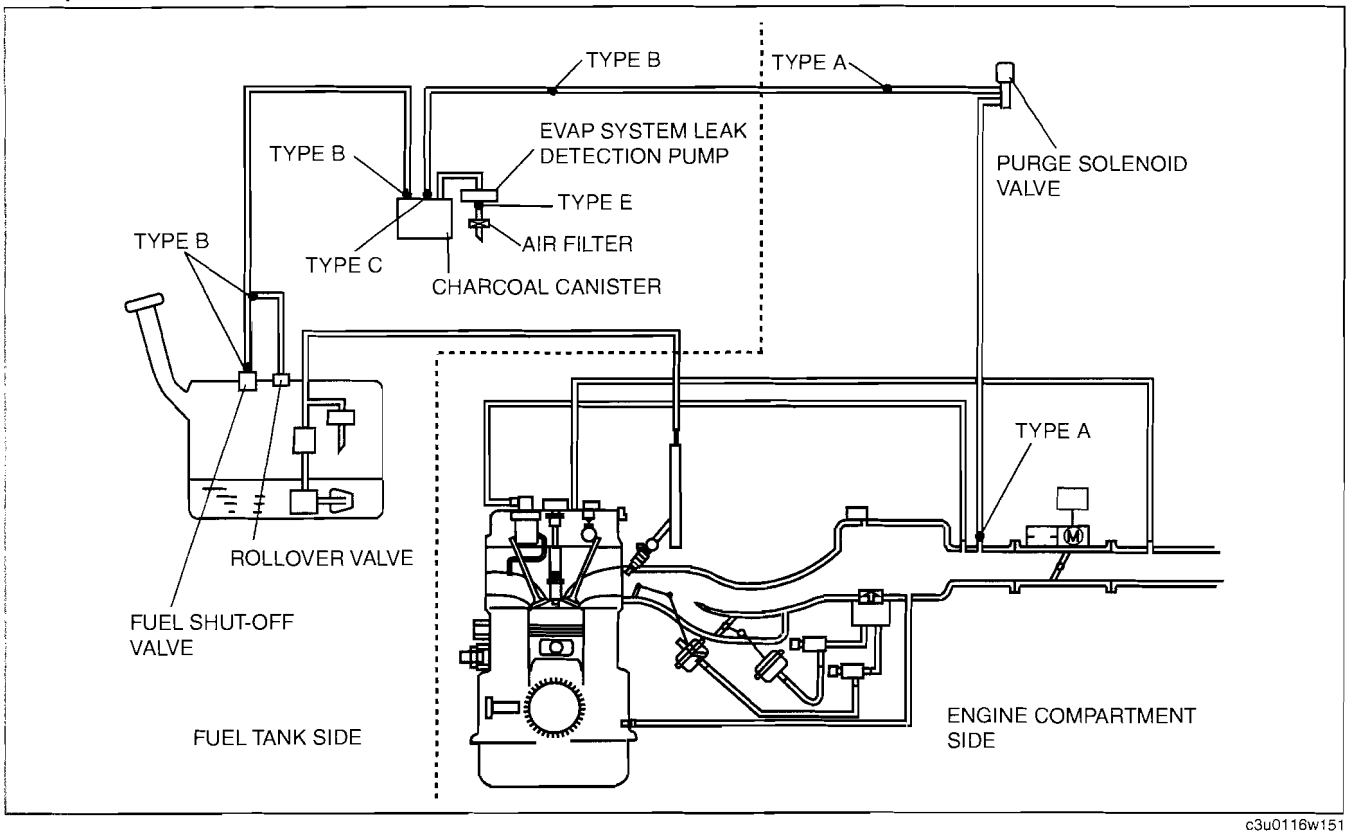
- **There are five types of quick release connectors. Verify the type and location, and install/remove properly.**

California emission regulation applicable model



c3u0116w152

Except for California emission regulation applicable model



c3u0116w151

Type A Removal

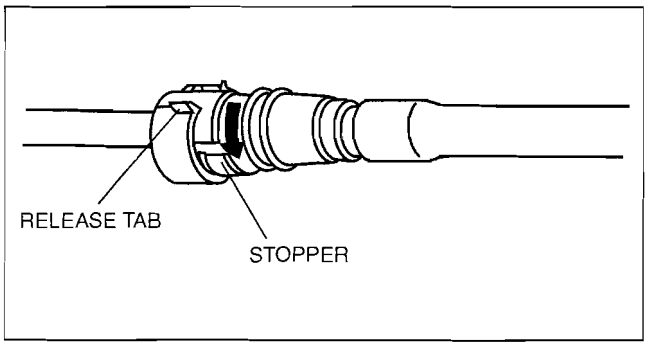
Caution

- **The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.**

Note

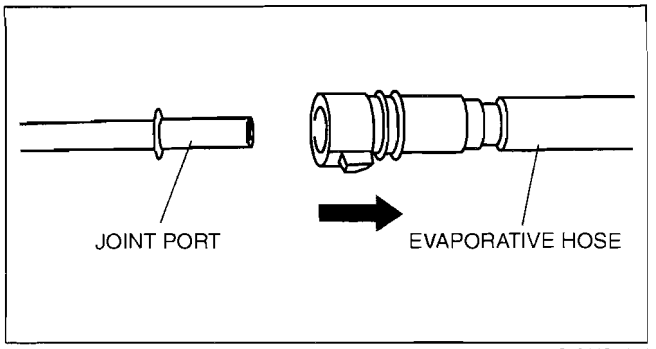
- The evaporative hose can be removed by pushing it to the joint port side to release the lock.

1. Rotate the release tab on the quick release connector to the stopper position.



am3uuw0000014

2. Pull out the evaporative hose straight from the joint port and disconnect it.
3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from scratches or dirt.



c3u0116w154

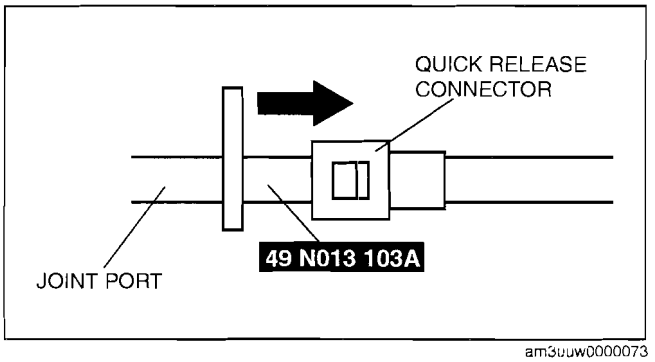
Type B Removal

Caution
- **Be careful not to damage the pipe when unlocking the retainer.**

Note
- When a prompt connector is detached, following SST can be used.
  - — **49 N013 103A**
  - — **49 E042 001**

When using SST 49 N013 103A

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Verify that the quick release connector joint area is free of foreign material. Clean if necessary.
3. Install the **SST** as shown in the figure and push into the quick release connector to disconnect the fuel pipe.
4. Cover the disconnected quick release connector and fuel pipe to prevent them from being scratched or contaminated with foreign material.



am3uuw0000073

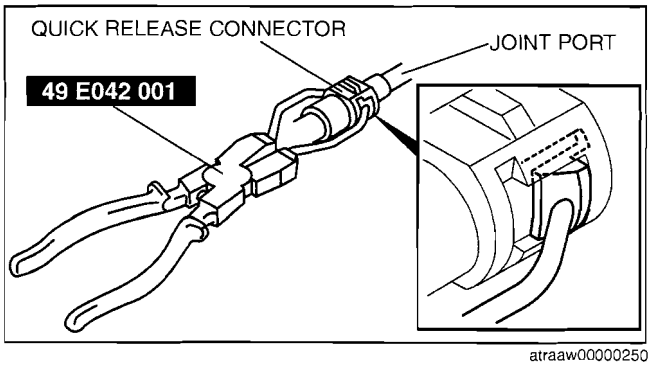
When using SST 49 E042 001

Note
- If the quick release connector is removed, replace the retainer with a new one.

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations.(See 01-14A-4 BEFORE SERVICE PRECAUTION[LF, L3].)
2. Set the **SST** parallel to the quick release connector.

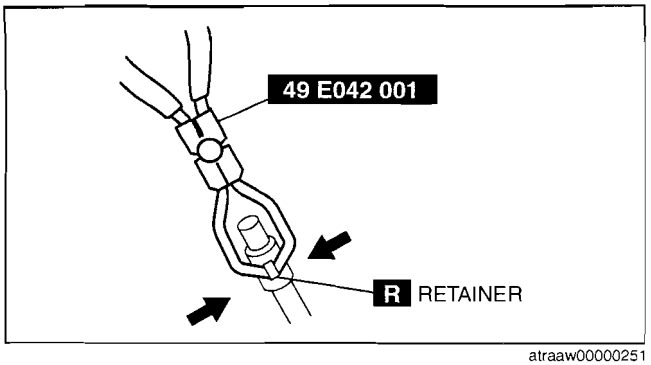
Note
- The quick release connector can be removed by pushing the center of the retainer tabs.
- The retainer is attached to the pipe even after the connector is disconnected.

3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.
4. Pull the connector side and disconnect the quick release connector.



atraaw00000250

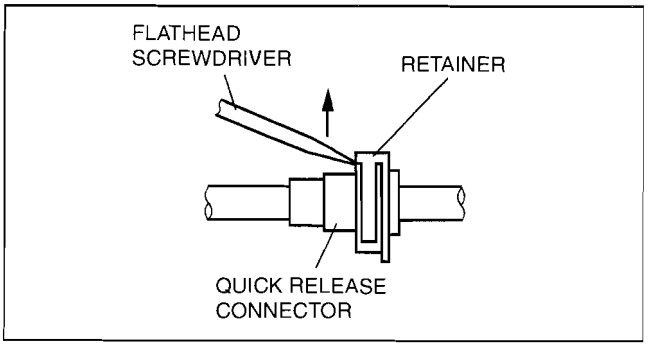
5. Raise a retainer tab using the **SST** and remove the retainer.
6. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.



atraaw00000251

Type C Removal

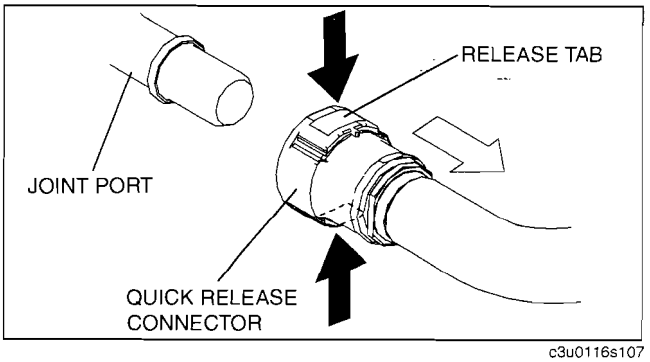
1. Move the retainer upward using a small flathead screwdriver or a similar tool.
2. Pull out the evaporative hose straight from the joint port and disconnect it.
3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



am3uuw0000014

Type D Removal

1. Squeeze the release tab until the locks are released.
2. Pull the quick release connector straight outward.
3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.

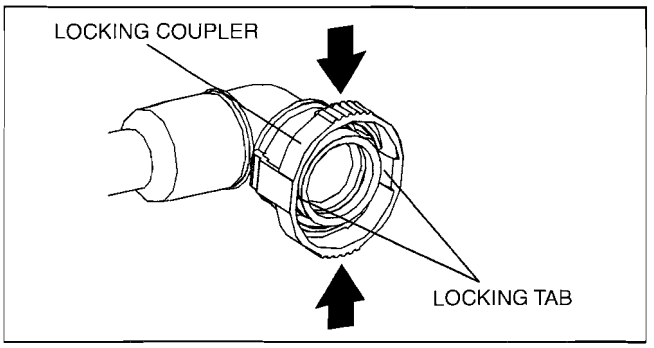


c3u0116s107

Type E Removal

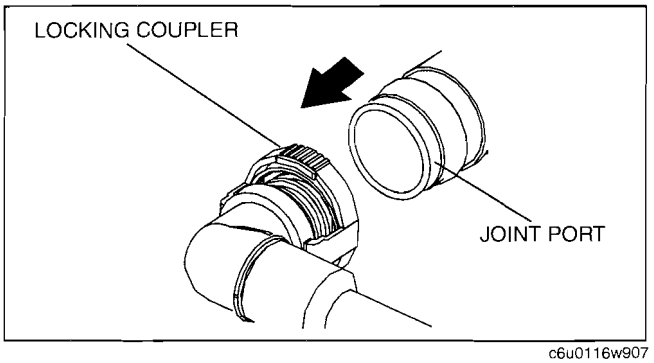
1. Squeeze the locking coupler until the locking tab opens and releases.

Note
- The locking coupler has two internal locking tabs which retain the joint port. Be sure that the squeezing place on the locking coupler is squeezed until it can be released from the joint port.



c6u0116w908

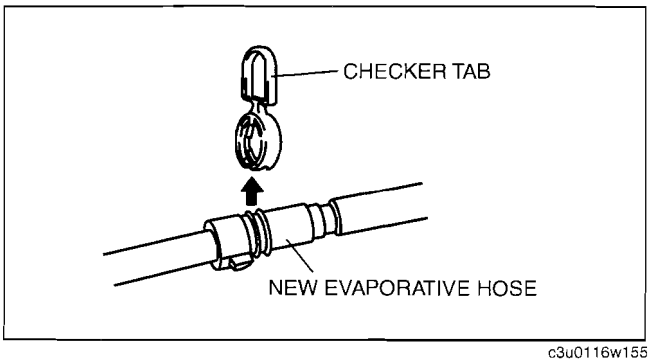
2. Pull the quick release connector straight outward.
3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



c6u0116w907

Type A Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.
- A checker tab is integrated with the quick release connector for new evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the joint port.



c3u0116w155

1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the joint port.
3. Reconnect the evaporative hose straight to the joint port until a click is heard.

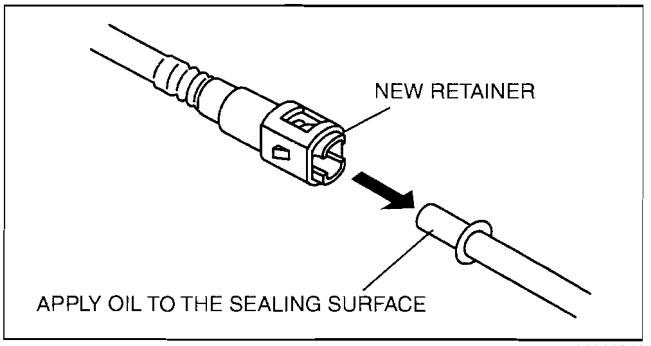
Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.

Type B Installation

Note
- Use only the designated genuine retainer when replacing the retainer.

1. Verify that the sealing surfaces of the fuel hose or fuel pipe have no damage or deformation. Replace if necessary.
   - If the O-ring of the quick release connector is damaged or displaced, replace the fuel hose.
2. Install a new retainer to the quick release connector, then visually verify that the retainer tab is installed securely to the connector.
3. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
4. Push the quick release connector into the fuel pipe until a click is heard.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.
   - If the quick release connector does not move at all, verify that the O-ring is not damaged or has slipped, and then reconnect the connector.
6. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See 01-14A-5 AFTER SERVICE PRECAUTION[LF, L3].)



atraaw00000242

Type C Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.

1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. When disconnecting and reconnecting the quick release connector, verify if the metal reinforcement pipe protrudes from the plastic pipe end while pressing the end with a finger.
   - If the metal pipe protrudes from the resin pipe, insert it flush with the end of the resin pipe.
3. Insert the joint port straight to the end of the quick release connector.
4. Push down the retainer using a finger.
   - If the retainer cannot be pushed down, push the joint port further to the quick release connector.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

Type D Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.

1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the joint port.
3. Reconnect the evaporative hose straight to the joint port until a click is heard.

Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

Type E Installation

Note
- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.

1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.
   - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the joint port.
3. Reconnect the evaporative hose straight to the joint port until a click is heard.

Note
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

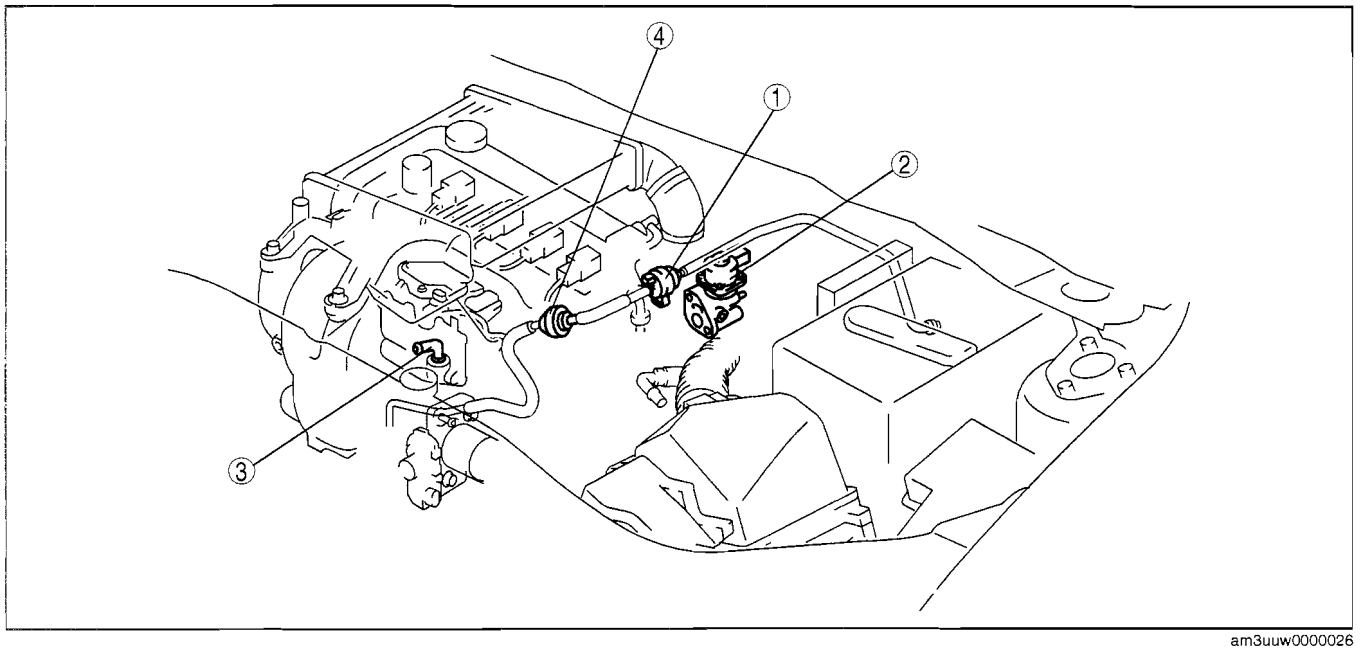
4. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

01-16B EMISSION SYSTEM [L3 WITH TC]

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM LOCATION INDEX[L3 WITH TC]

id011639800100

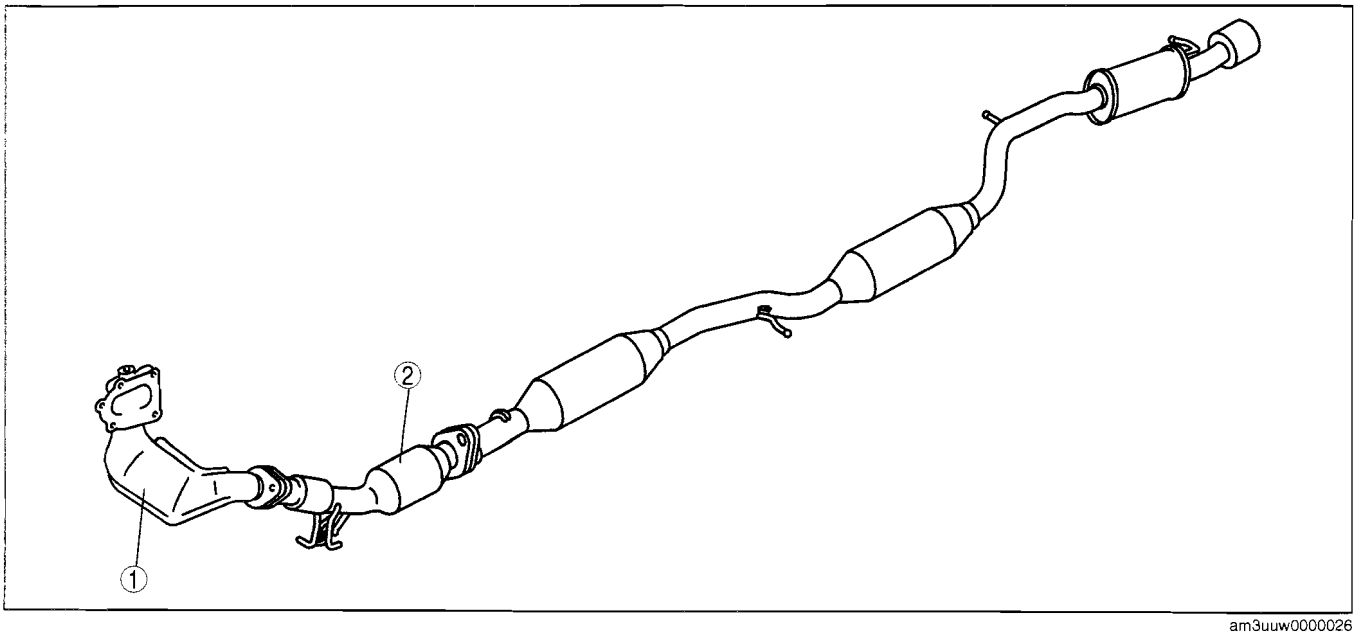
Engine Compartment Side



am3uuw0000026

1	Purge solenoid valve (See 01-16B-11 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-16B-11 PURGE SOLENOID VALVE INSPECTION[L3 WITH TC])
2	EGR valve (See 01-16B-13 EGR VALVE REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-16B-13 EGR VALVE INSPECTION[L3 WITH TC].)
3	PCV valve (See 01-16B-15 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[L3 WITH TC].)
4	Check valve (See 01-16B-12 CHECK VALVE INSPECTION[L3 WITH TC].)

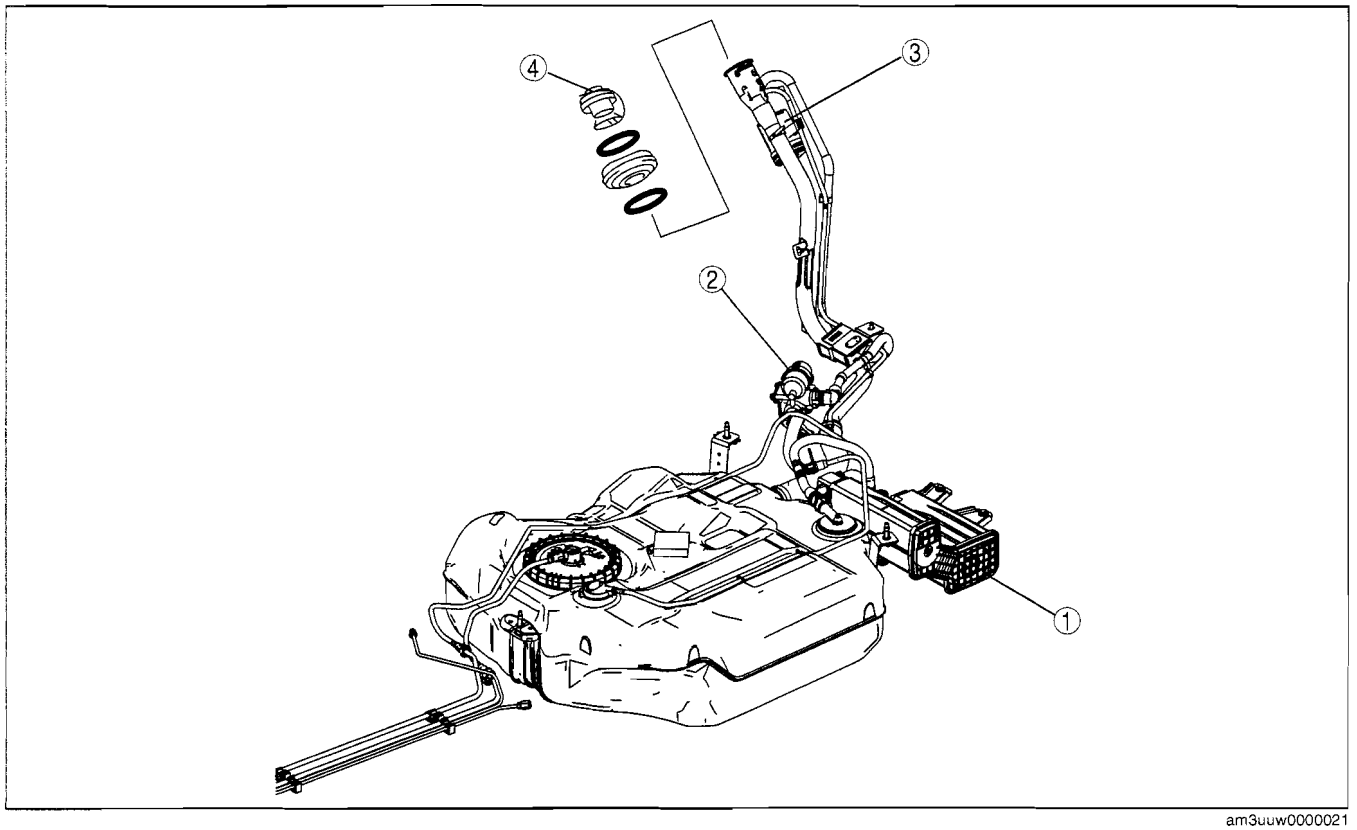
Exhaust system side



am3uuw0000026

1	WU-TWC (See 01-16B-15 WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[L3 WITH TC].)
2	TWC

Fuel Tank Side



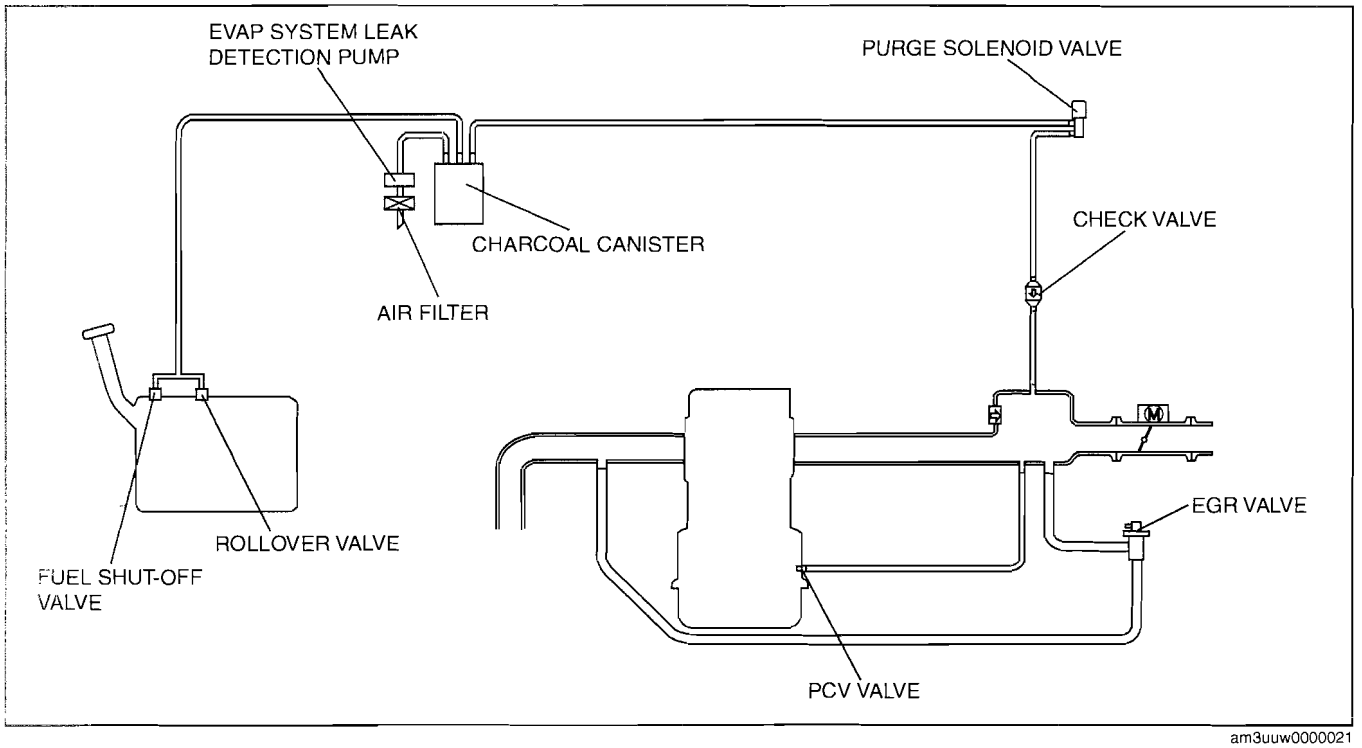
am3uuw0000021

1	Charcoal canister (See 01-16B-6 CHARCOAL CANISTER REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-16B-7 CHARCOAL CANISTER INSPECTION[L3 WITH TC].)
2	EVAP system leak detection pump (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-16B-8 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC].)

3	Air filter (See 01-16B-6 AIR FILTER INSPECTION[L3 WITH TC].)
4	Fuel filler cap (See 01-16B-4 FUEL-FILLER CAP INSPECTION[L3 WITH TC].)

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM DIAGRAM[L3 WITH TC]

id011639800200



am3uuw0000021

FUEL-FILLER CAP INSPECTION[L3 WITH TC]

id011639801300

Leakage Inspection

1. Perform the following **SST** (Evaporative Emission System Tester 134-01049) self-test:

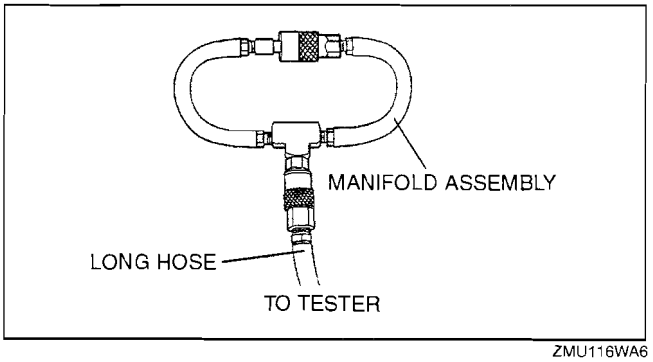
Note

- If the tester does not work correctly during self-test, refer to the tester operators manual for more detailed procedures.

(1) Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester display should be off at this time.
(2) Connect the long hose (part of **SST**) to the tester.
(3) Connect the manifold assembly (part of **SST**) to the long hose as shown.
(4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
- If not, refer to the tester operators manual to contact tester manufacturer.

(5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.
(6) Turn the control valve on the tester to the FILL position.
(7) Verify the left display reading is **within 13.9 to 14.0 in of water**.
- If not, adjust the pressure using the regulator knob located on the right side of the tester.

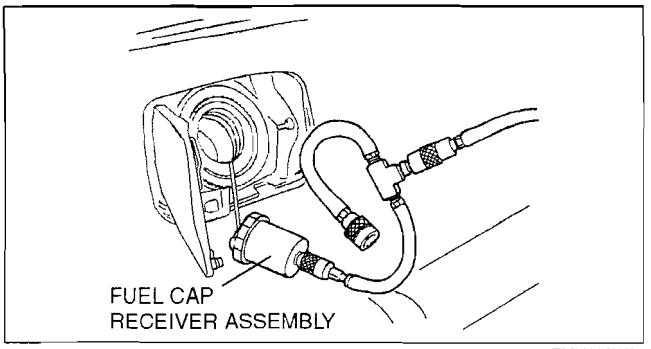
(8) Turn the control valve to TEST position and press the START switch.
(9) After the **2-min** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 in of water** loss is acceptable on the self-test.
- If the loss is **more than 0.5 in of water**, do one or more self-test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).



ZMU116WA6

2. Press the RESET switch to set the left display reading to **0.0**.

3. Connect the fuel cap receiver assembly (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.
   - If the fuel-filler cap is not a genuine part, replace it.
4. Turn the control valve to the FILL position.
5. Wait (**maximum 20 s**) until the left display reads **13.9 to 14 in** of water.
   - If the reading is slightly below, adjust it using the regulator knob.
   - If the reading is far below, the fuel-filler cap has leak. Replace it.
6. Turn the control valve to the TEST position and press the START switch.
7. After the **2-min** countdown (left display) is completed, check the test result (the failed/passed light on the tester).
   - If the green light turns on, the fuel-filler cap is OK.
   - If the red light turns on, the fuel-filler cap has leakage. Replace it.
8. Close the gas cylinder valve.
9. Turn the control valve to the FILL position.
10. Press the ON/OFF switch to turn off the tester.

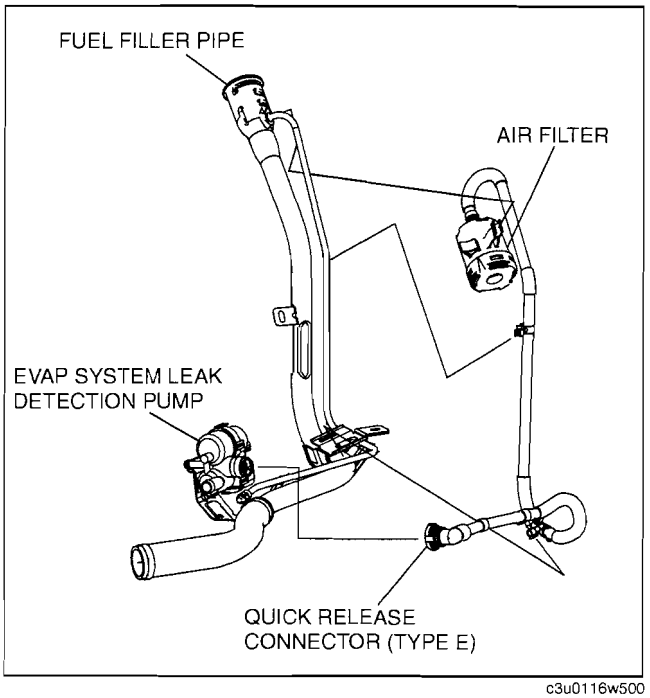


ZMU116WA7

AIR FILTER REMOVAL/INSTALLATION[L3 WITH TC]

id011639809500

1. Remove the rear tire (RH).
2. Remove the rear mudguard (RH).
3. Support the rear crossmember using a transmission jack.
4. Remove the rear shock absorber (RH) lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/ INSTALLATION.)
5. Loosen the rear crossmember installation bolts (6 locations) and lower the rear crossmember **30 mm {1.2 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
6. Remove the fuel-filler cap.
7. Remove the Air filter.
8. Install in the reverse order of removal.

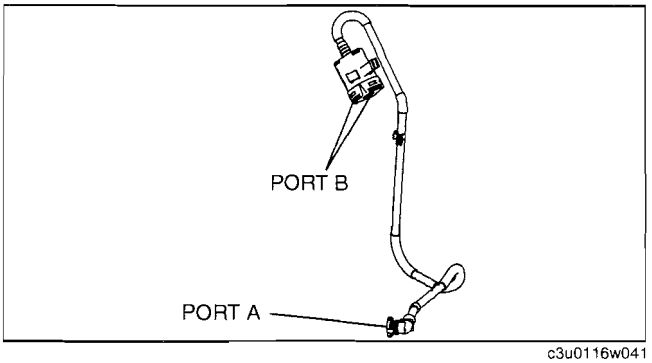


c3u0116w500

AIR FILTER INSPECTION[L3 WITH TC]

id011639800600

1. Remove the air filter. (See 01-16A-7 AIR FILTER REMOVAL/INSTALLATION[LF, L3].)
2. Blow from port A and verify that there is airflow from port B.
   - If not as specified, replace the air filter.
3. Blow from port B and verify that there is airflow from port A.
   - If not as specified, replace the air filter. (See 01-16A-7 AIR FILTER REMOVAL/ INSTALLATION[LF, L3].)

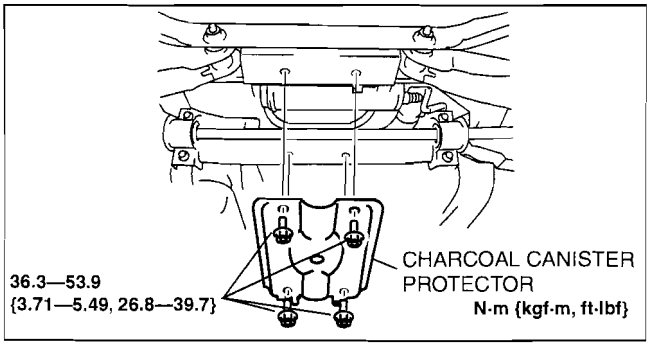


c3u0116w041

CHARCOAL CANISTER REMOVAL/INSTALLATION[L3 WITH TC]

id011639801500

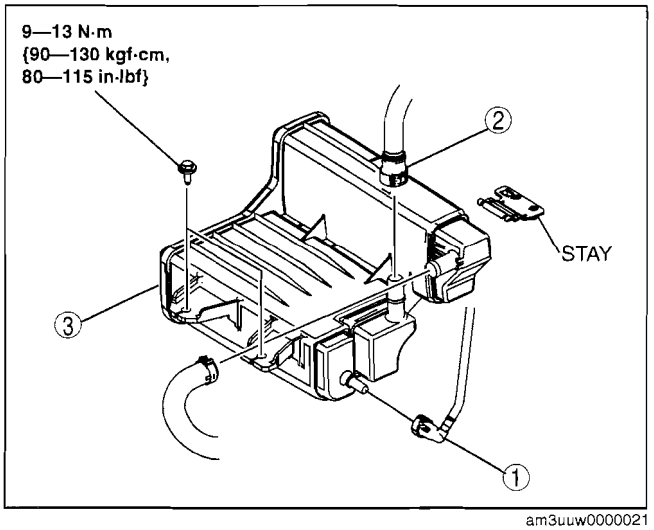
1. Remove the charcoal canister protector.
2. Remove the dynamic damper. (See 02-14-12 REAR CROSSMEMBER REMOVAL/ INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



c3u0116w051

5. Verify that the rear wheel alignment is within the specification. (See 02-11-4 REAR WHEEL ALIGNMENT.).

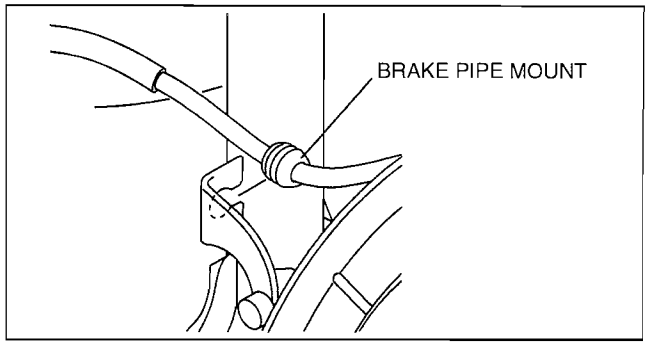
1	Quick connector (Type C) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
2	Quick connector (Type B) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
3	Charcoal canister (See 01-16B-7 Charcoal Canister Removal Note.)



am3uuw0000021

Charcoal Canister Removal Note

1. Support the rear crossmember using a transmission jack.
2. Remove the rear wheels.
3. Disconnect the ABS wheel-speed sensor wiring harness connector.
4. Disengage the brake pipe mount from bracket.
5. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
6. Loosen the rear crossmember installation bolts (6 locations) and lower the rear crossmember **approx. 140 mm {5.5 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
7. Disconnect the breather hose.
8. Remove the installation bolts and remove the charcoal canister.

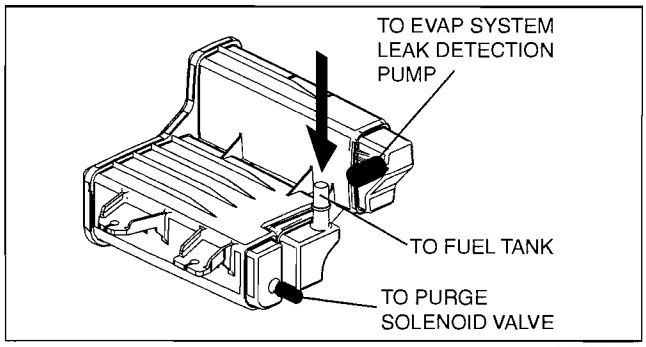


c3u0116w053

CHARCOAL CANISTER INSPECTION[L3 WITH TC]

id011639800500

1. Remove the charcoal canister. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].)
2. Plug the EVAP leak detection pump side and purge solenoid valve side of the charcoal canister.
3. Inspect for air leakage when blowing air by mouth from the fuel tank side.
   - If air leaks, replace the charcoal canister. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].)

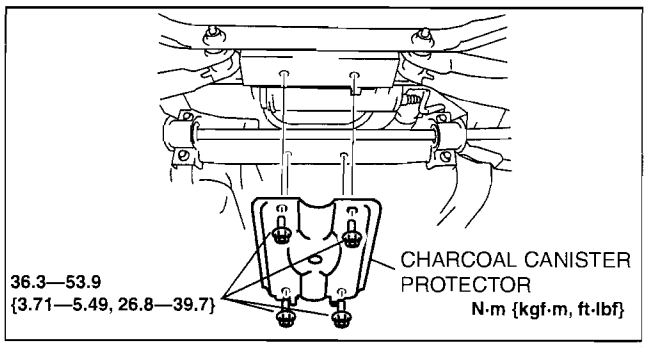


c3u0116w061

EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC]

id011639800700

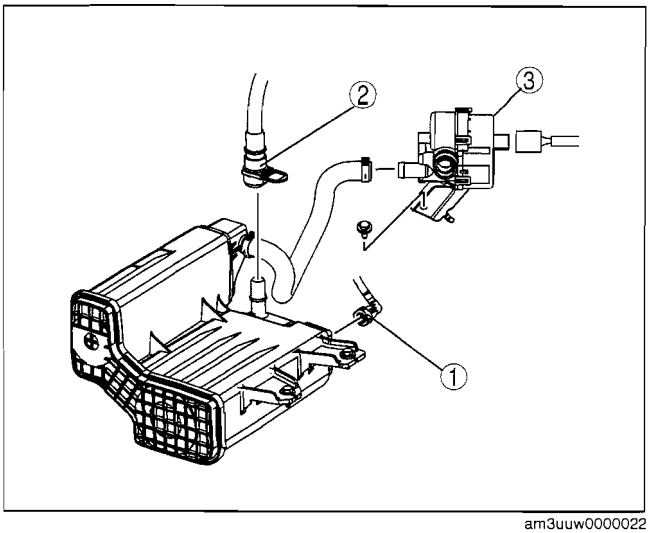
1. Remove the charcoal canister protector.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



c3u0116w051

4. Verify that the rear wheel alignment is within the specification. (See 02-11-4 REAR WHEEL ALIGNMENT.)

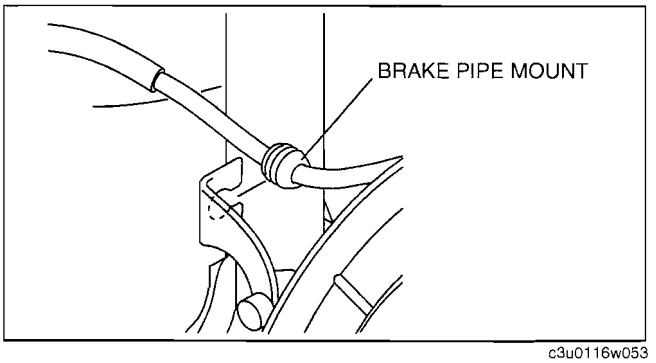
1	Quick connector (Type C) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
2	Quick connector (Type B) (See 01-14B-24 QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION[L3 WITH TC].)
3	EVAP system leak detection pump (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[LF, L3].)



am3uuw0000022

EVAP System Leak Detection Pump Removal Note

1. Support the rear crossmember using a transmission jack.
2. Remove the rear wheels.
3. Disconnect the ABS wheel-speed sensor wiring harness connector.
4. Disengage the brake pipe mount from bracket.
5. Remove the rear shock absorber lower bolts. (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.)
6. Loosen the rear crossmember installation nuts (6 locations) and lower the rear crossmember **approx. 140 mm {5.5 in}**. (See 02-14-12 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
7. Remove the installation bolt and remove the EVAP system leak detection pump.



c3u0116w053

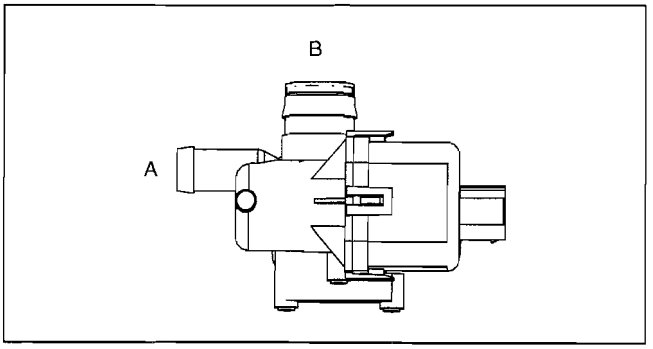
EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION[L3 WITH TC]

id011639800800

Airflow Inspection

Note
- Perform the following test only when directed.

1. Remove the EVAP system leak detection pump. (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
2. Blow air into port A and verify that there is airflow from port B.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
3. Blow air into port B and verify that there is airflow from port A.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[L3 WITH TC].)
   - If as specified, perform the following "Resistance Inspection".



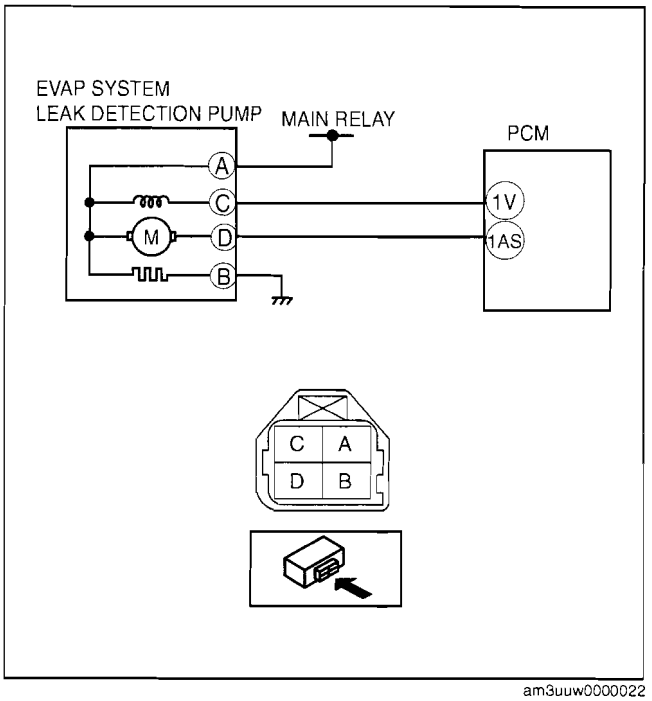
am3uuw0000095

Resistance Inspection

Note
- Perform the following procedure only when directed.

1. Inspect resistance of the EVAP system leak detection pump.
   - If not as specified, replace the EVAP system leak detection pump. (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/ INSTALLATION[L3 WITH TC].)
   - If as specified, carry out the "Circuit Open/ Short Inspection".

Terminals	Resistance (ohm)
A—B	20—50
A—C	26.6—32.4
A—D	MAX. 118

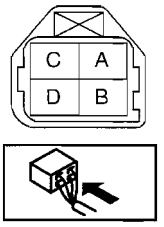


am3uuw0000022

Circuit Open/Short Inspection

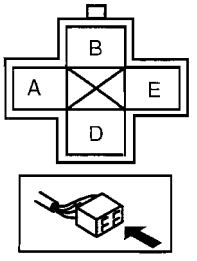
1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Inspect the following wiring harness for open or short circuit (continuity check).

EVAP SYSTEM LEAK DETECTION PUMP
WIRING HARNESS-SIDE CONNECTOR



am3uuw0000094

MAIN RELAY

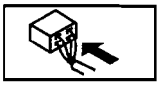


am3uuw0000094

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



am3uuw0000022

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal A and main relay terminal A
  - — EVAP system leak detection pump terminal B and the body ground
  - — EVAP system leak detection pump terminal C and PCM terminal 1V
  - — EVAP system leak detection pump terminal D and PCM terminal 1AS

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — EVAP system leak detection pump terminal A and the body ground
  - — EVAP system leak detection pump terminal B and power supply
  - — EVAP system leak detection pump terminal C and power supply
  - — EVAP system leak detection pump terminal C the body ground
  - — EVAP system leak detection pump terminal D and power supply
  - — EVAP system leak detection pump terminal D the body ground

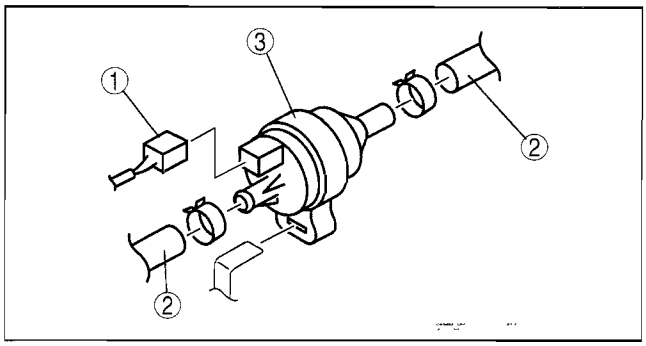
PURGE SOLENOID VALVE REMOVAL/INSTALLATION[L3 WITH TC]

id011639803500

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler duct.
4. Remove in the order indicated in the table.

1	Connector
2	Vacuum hose
3	Purge solenoid valve

5. Install in the reverse order of removal.



acxuuw00000217

PURGE SOLENOID VALVE INSPECTION[L3 WITH TC]

id011639800900

Airflow Inspection

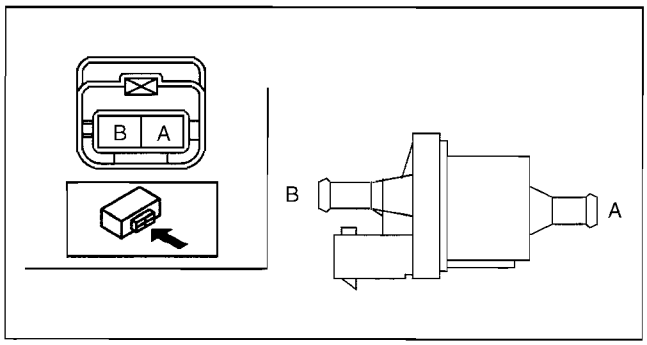
Note
- Perform the following test only when directed.

1. Disconnect the negative battery cable. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the purge solenoid valve. (See 01-16B-11 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[L3 WITH TC].)
3. Inspect airflow between the ports under the following conditions.
   - If not as specified, replace the purge solenoid valve. (See 01-16B-11 PURGE SOLENOID VALVE REMOVAL/INSTALLATION[L3 WITH TC].)
   - If as specified, carry out the "Circuit Open/ Short Inspection".

O—O : Continuity O=O : Airflow

Step	Terminal		Port	
	A	B	A	B
1	O—O			
2	B+	GND	O=O	

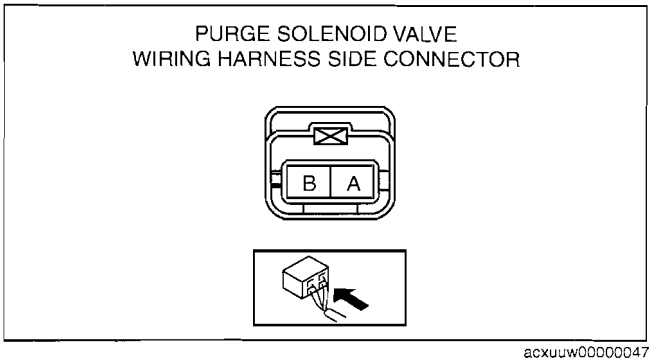
am3uuw0000094



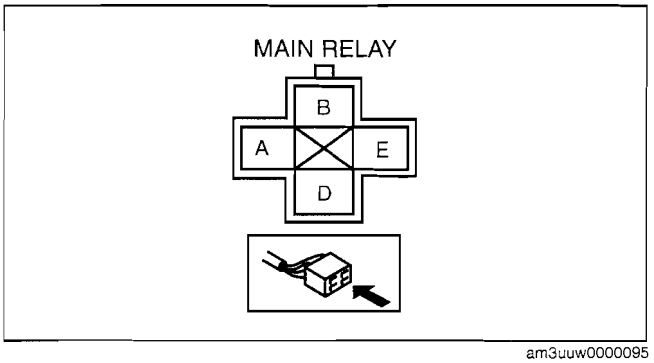
acxuuw00000046

Circuit Open/Short Inspection

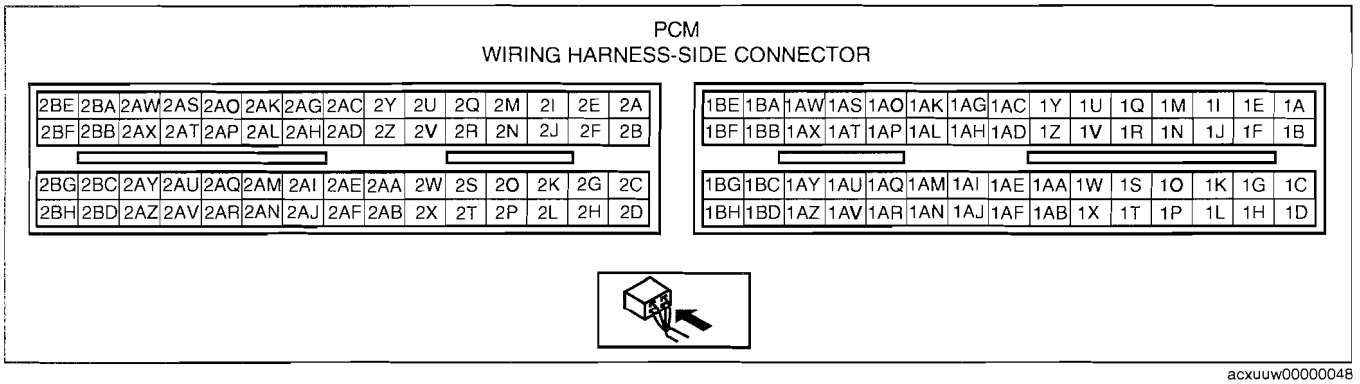
1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit (continuity check).



acxuuw00000047



am3uuw0000095



acxuuw00000048

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A and main relay terminal A
  - — Purge solenoid valve terminal B and PCM terminal 2AB

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Purge solenoid valve terminal A and body ground
  - — Purge solenoid valve terminal B and power supply
  - — Purge solenoid valve terminal B and body ground

CHECK VALVE INSPECTION[L3 WITH TC]

id011639801400

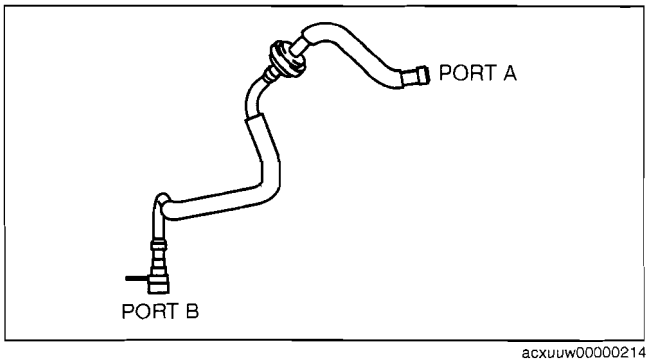
1. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the vacuum hose connected between the check valve and the purge solenoid valve from the purge solenoid valve.
3. Disconnect the vacuum hose connected between the check valve and the intake manifold from the intake manifold.

4. Blow through the check valve and verify that air flows as specified.
   - If not as specified, replace the check valve.

Specification

Condition	Airflow
Air applied from port A to B	Yes
Air applied from port B to A	No*

* : The check valve is normal if the aeration to port B is **3.5 kPa/min {0.03 kgf/cm2 min, 0.5 psi/min} or less** when **130 kPa {1.32 kgf/cm2, 18.9 psi}** is applied to port A.



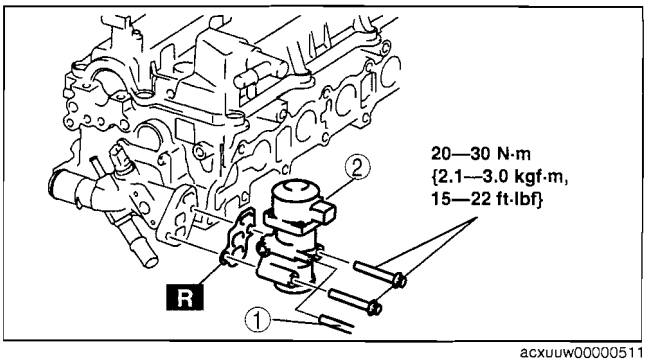
acxuuw00000214

EGR VALVE REMOVAL/INSTALLATION[L3 WITH TC]

id011639801000

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler cover. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Disconnect the EGR valve connector.
5. Remove the air hose and air duct. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
6. Drain the engine coolant. (See01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.

1	Water hose
2	EGR valve



acxuuw00000511

EGR VALVE INSPECTION[L3 WITH TC]

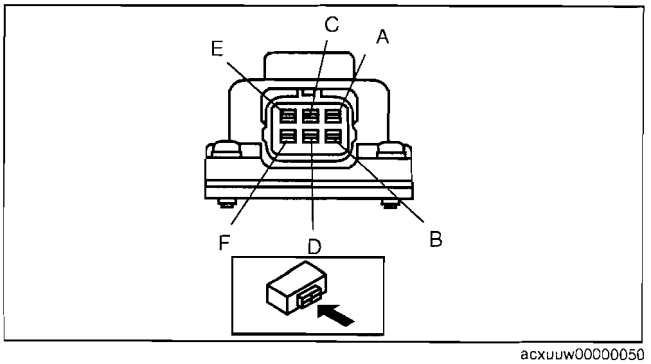
id011639801100

Resistance Inspection

Note
- Perform the following test only when directed.

1. Disconnect the negative battery cable. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect resistance of the EGR valve coils.
   - If not as specified, replace the EGR valve. (See 01-16B-13 EGR VALVE REMOVAL/INSTALLATION[L3 WITH TC])
   - If as specified, carry out the "Circuit Open/Short Inspection".

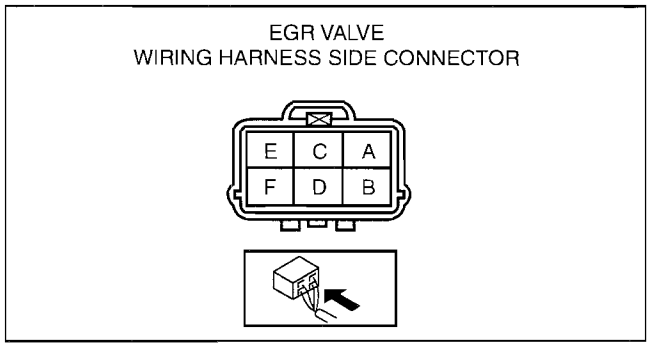
Terminals	Resistance (ohm)
C—E C—A D—B D—F	8—9



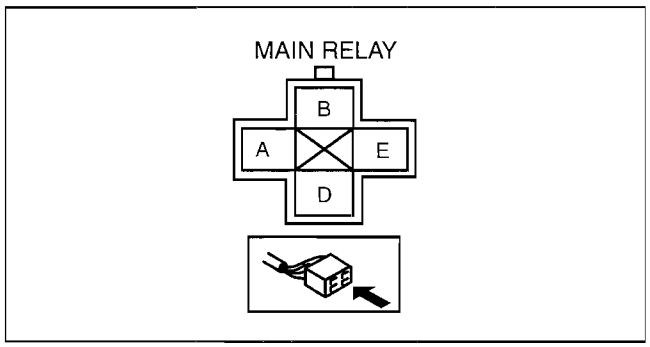
acxuuw00000050

Circuit Open/Short Inspection

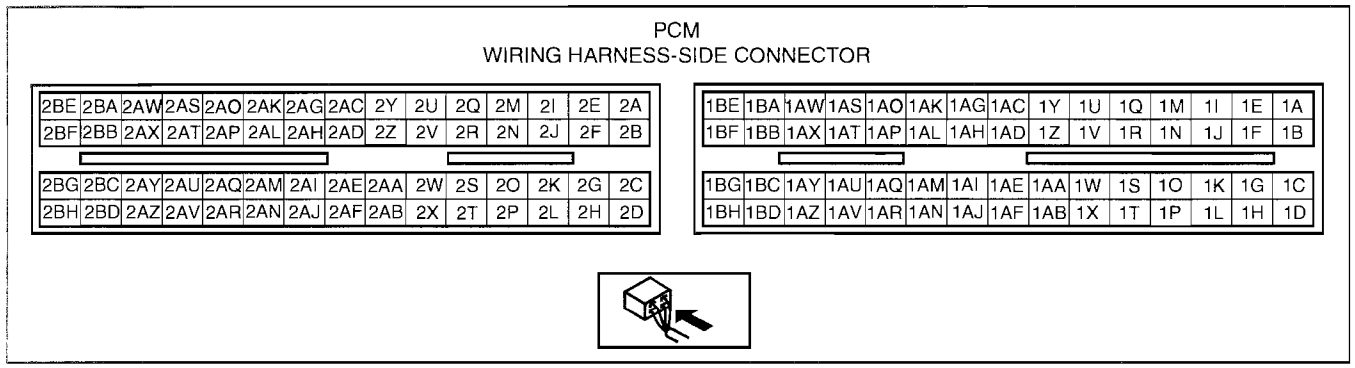
1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).



acxuuw00000051



am3uuw0000095



acxuuw00000052

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - EGR valve terminal A and PCM terminal 2AM
  - EGR valve terminal B and PCM terminal 2AR
  - EGR valve terminal C or D and main relay terminal A
  - EGR valve terminal E and PCM terminal 2AQ
  - EGR valve terminal F and PCM terminal 2AN

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - EGR valve terminal A and power supply
  - EGR valve terminal A and body ground
  - EGR valve terminal B and power supply
  - EGR valve terminal B and body ground
  - EGR valve terminal C or D and body ground
  - EGR valve terminal E and power supply
  - EGR valve terminal E and body ground
  - EGR valve terminal F and power supply
  - EGR valve terminal F and body ground

3. Remove the EGR valve, and inspect for any damage or clogging.
   - If there is no damage or clogging, replace the EGR valve. (See 01-16B-13 EGR VALVE REMOVAL/INSTALLATION[L3 WITH TC])

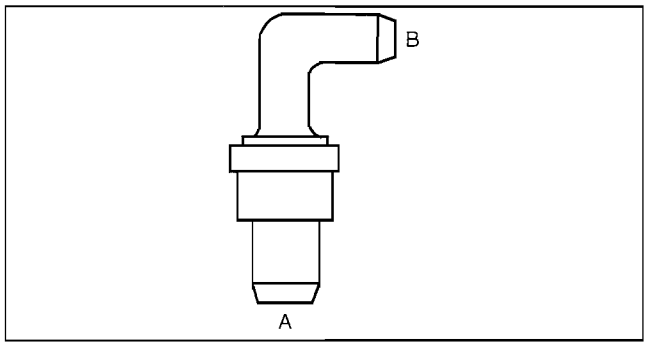
POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION[L3 WITH TC]

id011639800400

1. Remove the intake manifold. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
2. Remove the PCV valve.
3. Blow through the valve and verify that air flows as specified.
   - If not as specified, replace the PCV valve.

Specification

Condition	Airflow
Air applied from port A to B	Yes
Air applied from port B to A	No



acxuuw00001930

WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION[L3 WITH TC]

id011639801200

Caution
- **Perform the following procedures, DTC P0421 is indicated only.**

1. Connect the M-MDS to the DLC-2.
2. Start the engine and warm it up to normal operating temperature.
3. Turn off the engine.
4. Verify that the engine compression is within the specification. (See 01-10A-11 COMPRESSION INSPECTION[LF, L3].)
   - If the compression pressure is not within the specification, repair or replace the malfunction part.
5. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to allow the front catalytic converter to reach operating temperature.
6. Stop the vehicle and leave it in a safe space.
7. Access Test ID 10:21:80 on the "Diagnostic Monitoring Test Result" function.
8. Verify that the test result is within the specified indicated on the M-MDS.
   - If it is not as specified, replace the front catalytic converter.

ROLLOVER VALVE REMOVAL/INSTALLATION[L3 WITH TC]

id011639804600

Note
- The rollover valve cannot be removed as it is built into the fuel tank.

ROLLOVER VALVE INSPECTION[L3 WITH TC]

id011639804500

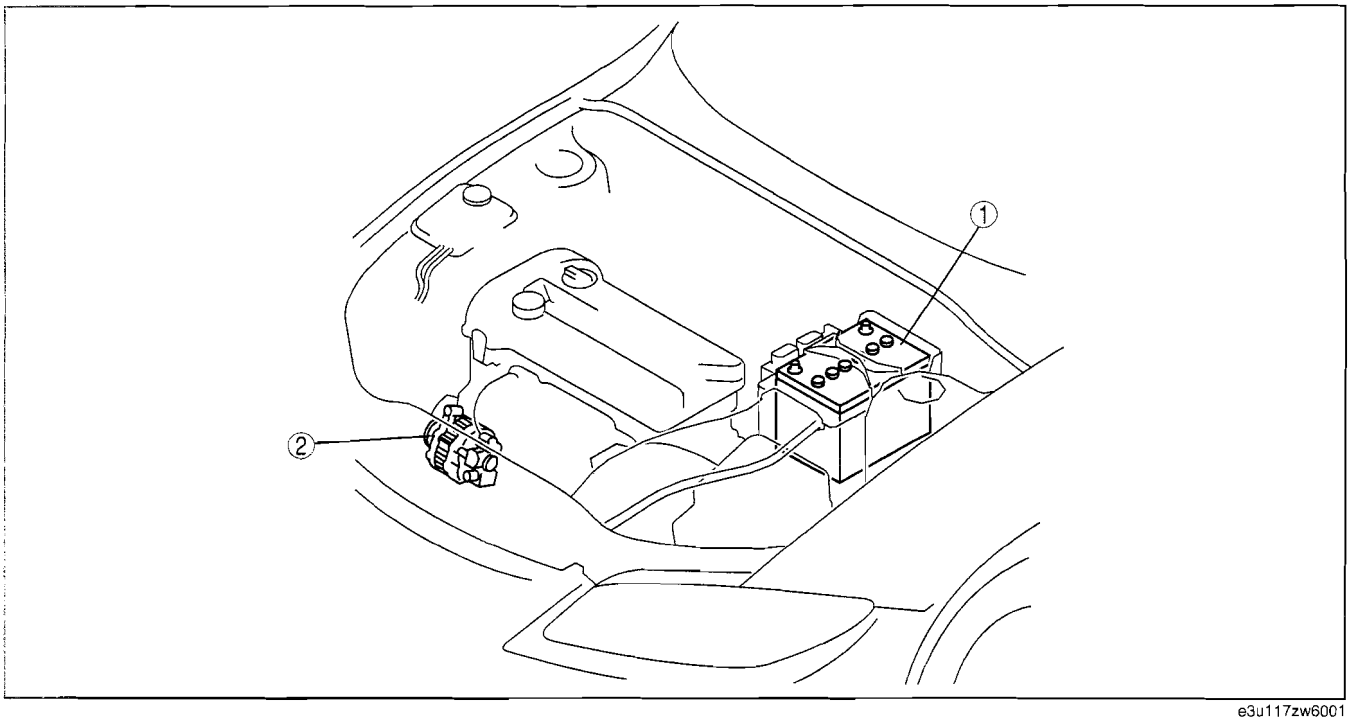
Note
- The rollover valve cannot be disassembled and inspected as it is built into the fuel tank.

1. Perform the fuel tank inspection. (See 01-14B-11 FUEL TANK INSPECTION[L3 WITH TC].)

01-17A CHARGING SYSTEM [LF, L3]

CHARGING SYSTEM LOCATION INDEX[LF, L3]

id0117a4800100



e3u117zw6001

1	Battery (See 01-17A-2 BATTERY REMOVAL/ INSTALLATION[LF, L3].) (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-6 BATTERY RECHARGING[LF, L3].)

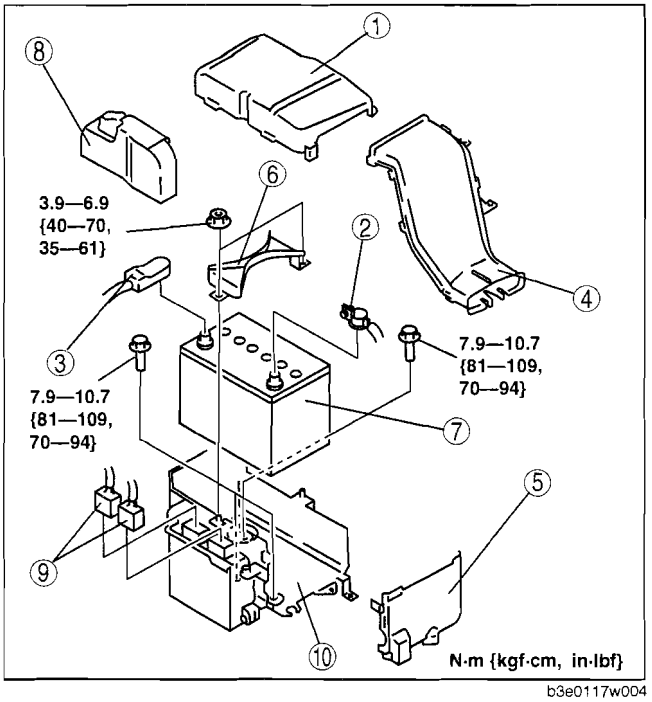
2	Generator (See 01-17A-6 GENERATOR REMOVAL/ INSTALLATION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].) (See 01-17A-12 GENERATOR DISASSEMBLY/ ASSEMBLY[LF, L3].)

BATTERY REMOVAL/INSTALLATION[LF, L3]

id0117a4800500

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

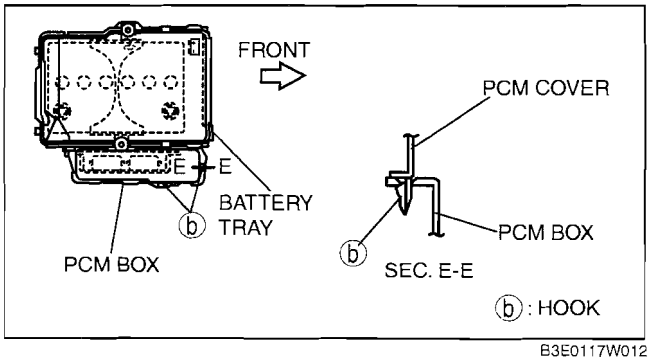
1	Battery cover (See 01-17A-3 Battery Cover Installation Note.)
2	Negative battery cable
3	Positive battery cable
4	Battery duct (See 01-17A-3 Battery Duct Installation Note.)
5	Battery box (See 01-17A-3 Battery Box Installation Note.)
6	Battery clamp (See 01-17A-3 Battery Clamp Installation Note.)
7	Battery
8	PCM cover (See 01-17A-2 PCM Cover Installation Note.)
9	PCM connectors
10	Battery tray and PCM component



b3e0117w004

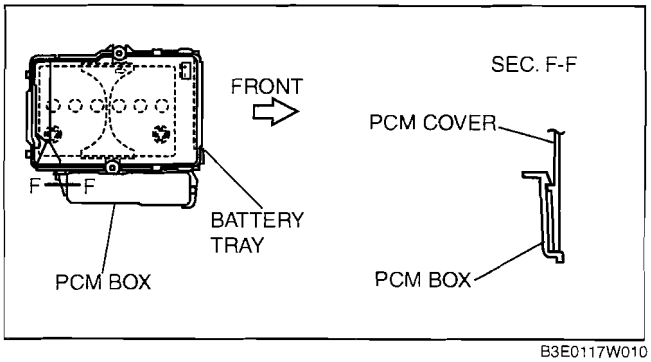
PCM Cover Installation Note

1. Install with PCM cover hooks B aligned with the PCM box holes at two points.



B3E0117W012

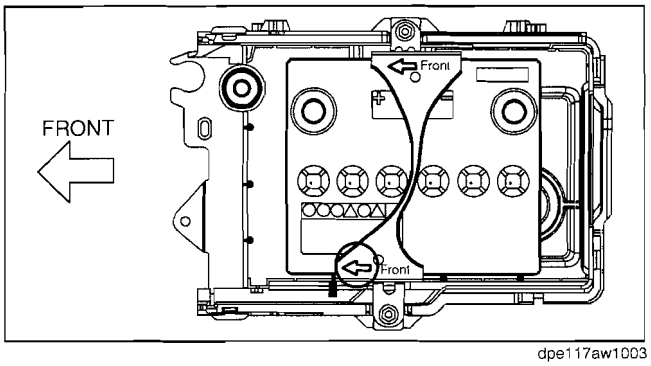
2. Install the PCM cover to the PCM box hook.



B3E0117W010

Battery Clamp Installation Note

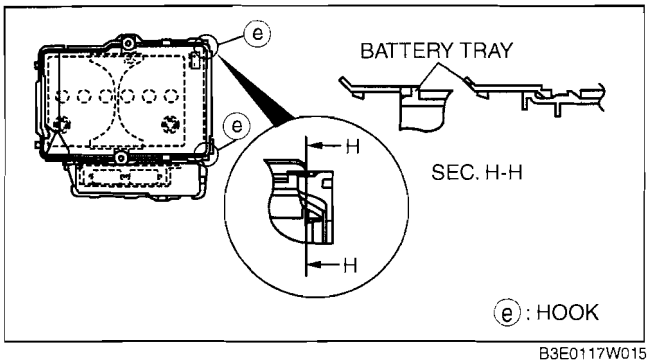
1. Assemble the battery clamp so that the arrow on it is pointed toward the front of the vehicle.



dpe117aw1003

Battery Box Installation Note

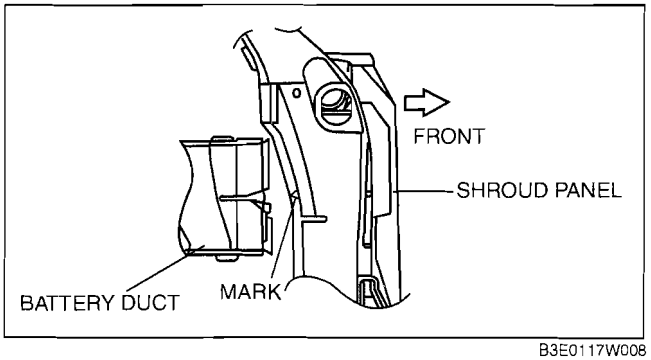
1. Assemble with battery box hooks E aligned with the battery tray holes at two points.



B3E0117W015

Battery Duct Installation Note

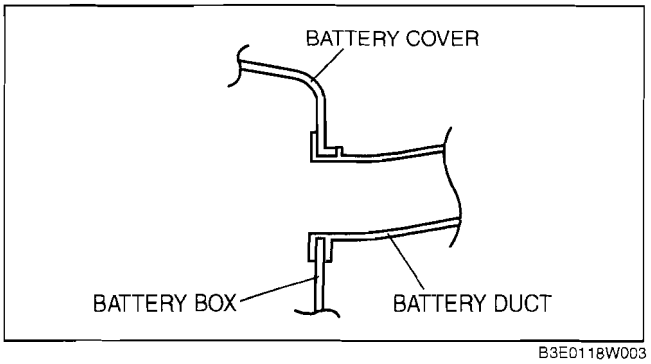
1. Align the mark of the shroud panel with notch in the battery duct, and install the battery duct to the shroud panel.



B3E0117W008

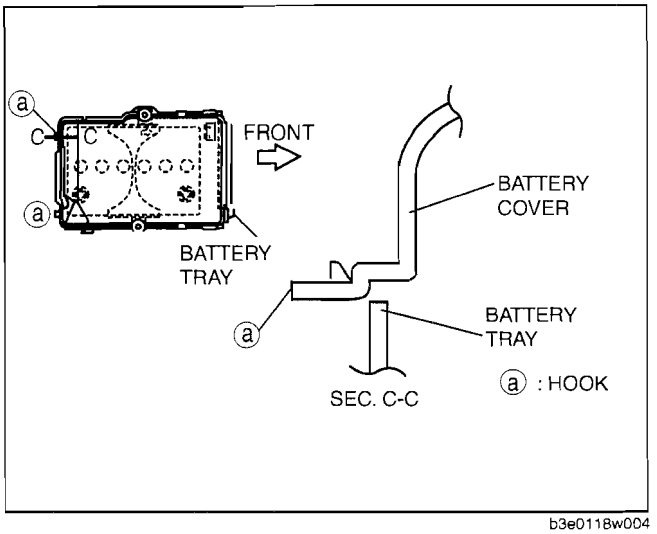
Battery Cover Installation Note

1. Install the battery duct between the battery cover and the battery box.



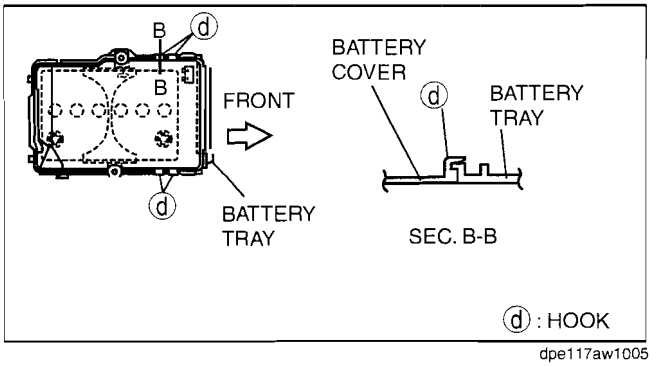
B3E0118W003

2. Install with battery cover hooks A aligned with the battery tray holes at two points.



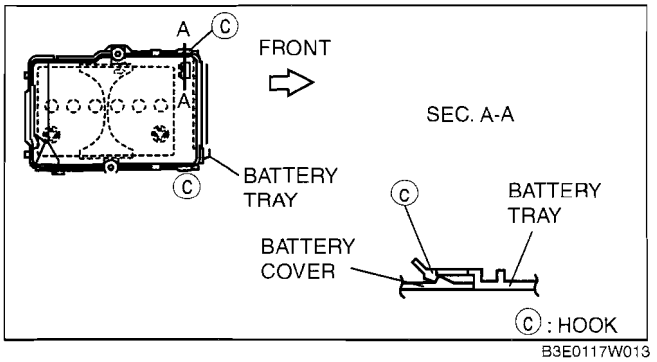
b3e0118w004

3. Install with battery cover hooks D aligned with the battery tray flange at four points.



dpe117aw1005

4. Set the battery cover to battery tray hooks C at two points.



B3E0117W013

BATTERY INSPECTION[LF, L3]

id0117a4800600

Warning

- **Since battery acid is toxic, be careful when handling the battery.**
- **Since battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.**
- **In case battery acid contacts skin, eyes, or clothing, flush it immediately with running water. Especially if the acid gets in the eyes, flush with water for more than 15 min and get prompt medical attention.**

Electrolyte gravity

1. Measure the electrolyte specific gravity using a hydrometer.
   - If it is less than the specification, recharge the battery. (See 01-17A-6 BATTERY RECHARGING[LF, L3].)

Standard electrolyte gravity
1.22—1.29 [20 °C {68 °F}]

Battery voltage

1. Inspect the battery as follows:

Step	Inspection		Action
1	Measure the battery positive voltage.	12.4 V or more	Go to Step 3.
		Less than 12.4 V	Go to the next step.
2	Quick charge for **30 min** and recheck voltage.	12.4 V or more	Go to the next step.
		Less than 12.4 V	Replace the battery.
3	Using the battery load tester, apply load current (see load test chart) and record battery voltage after **15 s**. Is voltage more than the specification?	Yes	Normal
		No	Replace the battery.

Load test chart

Battery	Current load (A)
50D20L	150
75D23L	195
80D26L	195

Standard specification

Battery temp. (°C {°F})	Minimum voltage (V)
4 {39}	9.3
10 {50}	9.4
16 {61}	9.5
21 {70}	9.6

Back-up current

1. Verify that the ignition switch is off (key has been removed) and that all doors are closed.
2. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the negative battery cable.
4. Connect the tester between the negative battery terminal and negative battery cable, leave the battery undisturbed for **30 min**, and then measure the back-up current.
   - If not within the specification, measure the back-up current while removing the fuses one by one from the inside of the main fuse block and the inside of the fuse block.

Note

- If the battery is not left undisturbed for **30 min**, the tester will indicate a high value (**approx. 300 mA**).
- If the key or any electrical accessory is operated within **approx. 30 min** after the tester is connected, the battery must be left undisturbed for **approx. 30 min** from that point.

Caution

- **Operating electrical loads while the back-up current is being measured can damage the tester.**

Note

- For vehicles with the immobilizer system, the system periodically shifts synchronization of the security light flashing. Therefore, **45 mA (0.1 s)** current is supplied when the security light is illuminated, and **25 mA (2 s)** current is supplied when the security light is not illuminated. In addition, the measuring instrument, which shows the average value, indicates around **30 mA**.

Battery back-up current

Vehicles with immobilizer system: 25—45 mA
Vehicles without immobilizer system: 30 mA or less

5. Inspect and repair wiring harnesses and connectors of the fuse where the current has decreased.

BATTERY RECHARGING[LF, L3]

id0117a4800700

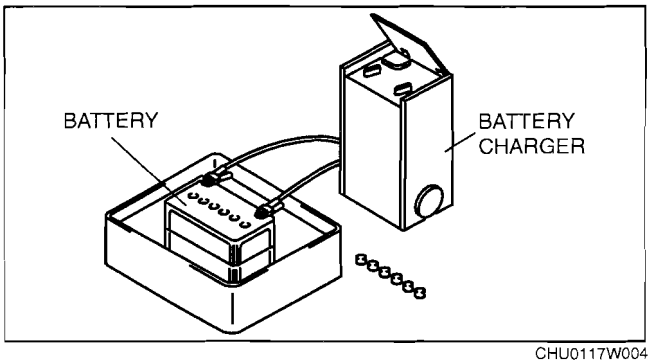
Warning
- **Keep all flames away from the battery, otherwise evaporated gas from the battery fluid may catch fire, and cause serious injury.**
- **Remove the battery filler caps when recharging to prevent battery deformation or damage.**

Caution
- **Do not quick charge for more than 30 min. It will damage the battery.**

1. Remove the battery and then place it in a pan of water.
2. Connect a battery charger to the battery and adjust the charging current as follows.

Standard specification

Battery type (5-h rate)	Recharge current (A)	Quick charge (A/30 min)
50D20L (40)	4.0—5.0	25
75D23L (52)	5.0—6.0	35
80D26L (55)	5.5—6.5	35



CHU0117W004

3. After the battery is recharged, verify that the voltage is within the specification and remains at the same value for **1 h or more** after the recharging has been completed.
   - If not within the specification, replace the battery.

Standard voltage
12.4 V or more

GENERATOR REMOVAL/INSTALLATION[LF, L3]

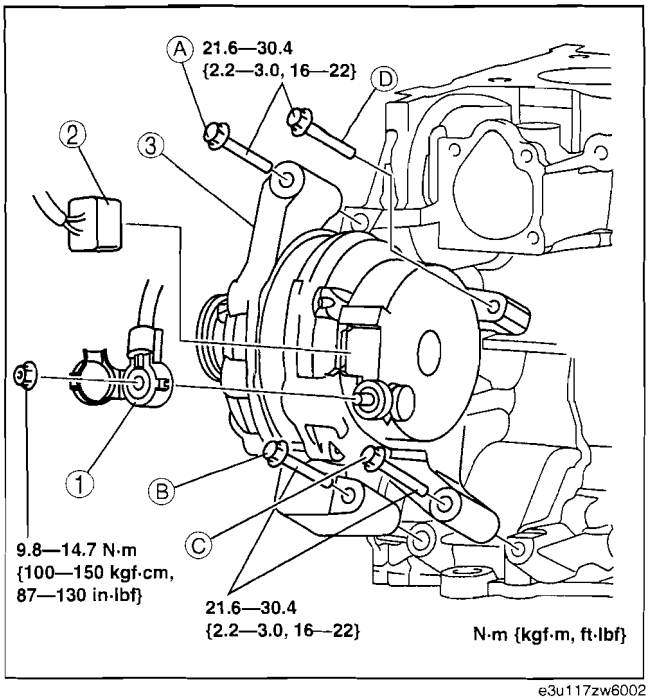
id0117a4800200

Warning
- **When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery negative cables before performing the following operation.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover and splash shield as a single unit.
4. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
5. Position the coolant reserve tank out of the way.
6. Position the drive belt out of the way. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].)
7. Position the coolant reserve tank out of the way.
8. Remove in the order indicated in the table.

9. Install in the reverse order of removal.

1	Terminal B cable
2	Generator connector
3	Generator (See 01-17A-7 Generator Installation Note.)



e3u117zw6002

Generator Installation Note

1. Align the generator fixing hole with the engine side hole, then temporarily tighten the generator installation bolts in the order of A, B, C, and D.
2. Securely tighten the generator installation bolts in the order of A, B, C, and D.

GENERATOR INSPECTION[LF, L3]

id0117a4800300

Caution

- **Do not apply direct battery positive voltage to generator terminal D, otherwise it could cause damage to the internal parts (power transistor) of the generator.**

Generator warning light

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].)
3. With the ignition switch turned to the ON position, verify that the generator warning light illuminates.
   - If it does not illuminate, inspect the generator warning light and the wiring harness.
     — If the generator warning light and the wiring harness are normal, inspect the PCM.
4. Verify that the generator warning light goes out after the engine is started.
   - If it does not go out, inspect if any one of the following DTCs in the on-board diagnostic system are displayed: P0112, P0113, P2502, P2503, P2504. (See 01-02A-22 DTC TABLE[LF, L3].)

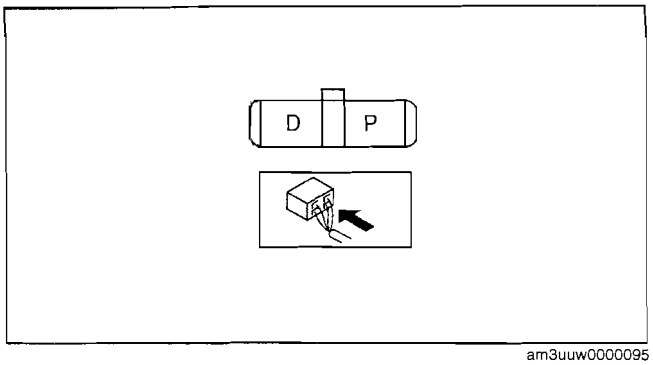
Generator
Voltage

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].)
3. Turn off all electrical loads.
4. Start the engine.
5. Verify that the generator rotates smoothly without any noise while the engine is running.
   - If there is any noise, find the cause and repair or replace the generator.

6. Measure the voltage at each terminal using a tester.

Standard specification

Terminal	IG-ON (V)	Idle (V) [20°C {68 °F}]
B	B+	13.0—15.0
P	Approx. 1.0 or less	Approx. 3.0—8.0
D	Approx. 0	*



am3uuw0000095

* : Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster

Current

Note
- Since the charging current decreases rapidly after starting the engine, carry out the following procedure quickly, and read the maximum current value.

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].)
3. Disconnect the negative battery cable.
4. Connect a tester, which can read **120 A or more**, between generator terminal B and the wiring harness.
5. Connect the negative battery cable.
6. Turn off all electrical loads.
7. Start the engine.
8. Increase engine speed to **2,500 rpm**.

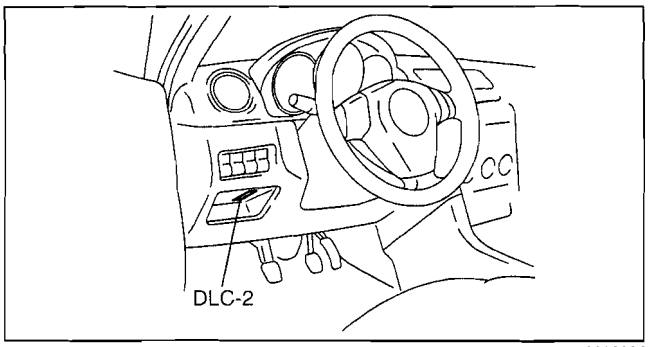
Note
- When the electrical load on the vehicle is low, the specified current cannot be verified although the generator is normal. In this case, increase the electrical load (Leave the headlights turned on for a while, then discharge the battery, or use a similar method.) and recheck.
- When the generator itself or the ambient temperature are too high, the specified current also cannot be verified. In this case, cool down the generator and recheck.

9. Turn the following electrical loads on and verify that the current reading increases more than the minimum value indicated below.
   — If it is not as specified, go to the PCM and generator shearing inspection. (See 01-17A-9 PCM and generator shearing inspection.)
   - Headlights (high-beam)
   - Blower motor (HI)
   - Rear window defroster
   - Brake lights

Minimum current value
70 % of the nominal output current (nominal output current: 90 A)
[Ambient temp. 20°C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]

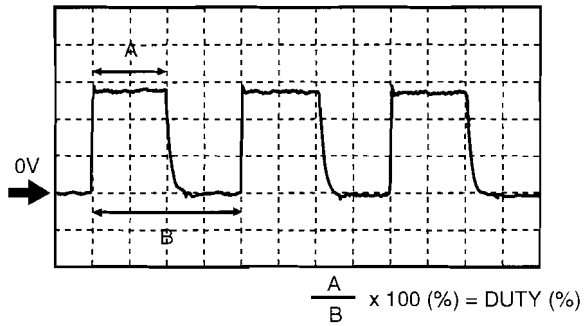
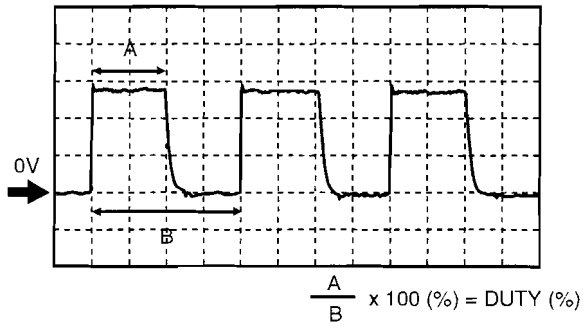
PCM and generator shearing inspection

1. Connect the M-MDS to the DLC-2.



am3uuw0000095

2. Inspect as follows:

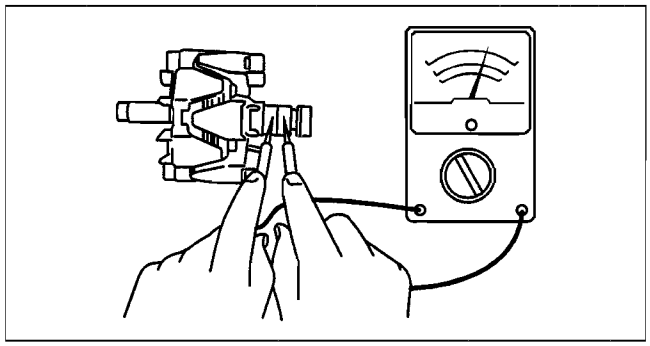
Step	Inspection		Action
1	Measure the generator terminal B voltage when the electrical loads*1 are on and off.	15 V or more	Go to Step 2.
		13–15 V	Normal*2
		13 V or less	Go to Step 3.
2	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ*3, 2AM*4, 2AJ*5 using a tester. Is the voltage between 13–15 V ?	Yes	Go to Step 4.
		No	PCM input error.
3	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ*3, 2AM*4, 2AJ*5 using a tester. Is the voltage between 13–15 V ?	Yes	Go to Step 5.
		No	PCM input error.
4	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI*3, 2AQ*4, 2AI*5 using an oscilloscope. Is the duty value 100 % ? 	Yes	PCM input error.
		No	PCM, generator, or both is not normal.
5	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI*3, 2AQ*4, 2AI*5 using an oscilloscope. Is the duty value 0 % ? 	Yes	PCM input error.
		No	PCM, generator, or both is not normal.

*1 : Headlights, blower motor, rear window defroster, and brake lights.
*2 : If the generator field coil duty value does not change when electrical loads (such as headlights, blower motor, rear window defroster, brake lights) are on or off, inspection with discharged battery is needed.
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model with LF ATX
*5 : Except for California emission regulation applicable model with LF MTX, L3

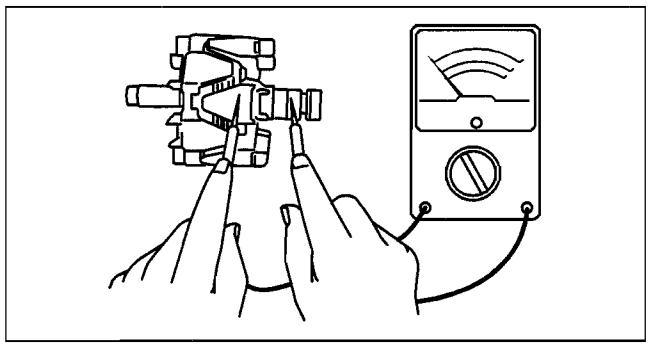
Generator Inner Parts
Rotor

1. Measure the resistance between the slip rings using a tester.
   - If not within the specification, replace the rotor.

   Resistance [20 °C {68 °F}]
   1.8—2.2 ohms

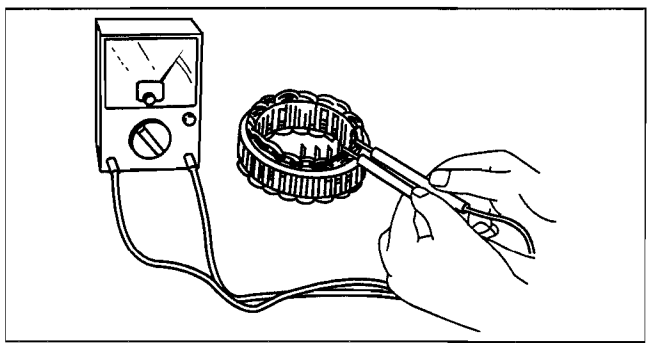

am3uuw0000095

2. Verify that there is no continuity between the slip ring and core using a tester.
   - If there is continuity, replace the rotor.
3. Inspect the slip ring surface condition.
   - If the slip ring surface is rough, use a lathe or fine sandpaper to smooth it.

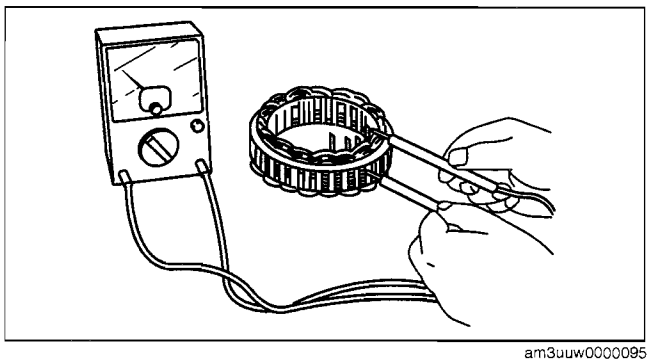

am3uuw0000095

Stator coil

1. Inspect for continuity between the stator coil leads using a tester.
   - If there is no continuity, replace the stator.


am3uuw0000095

2. Verify that there is no continuity between the stator coil leads and the core using a tester.
   - If there is continuity, replace the stator coil.

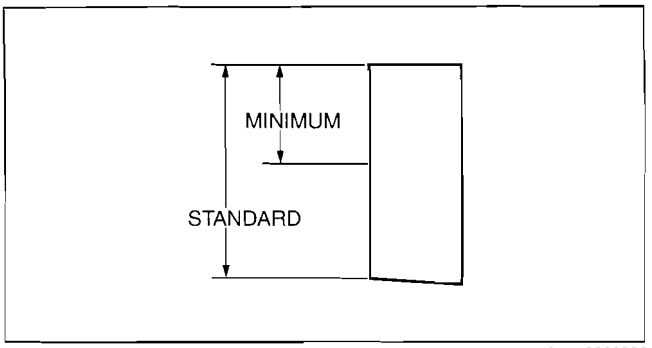

am3uuw0000095

Brush

1. Inspect brushes for wear.
   - If any brush is worn almost to or beyond the limit, replace all of the brushes.

Standard brush length
18.5 mm {0.73 in}

Minimum brush length
5.0 mm {0.2 in}



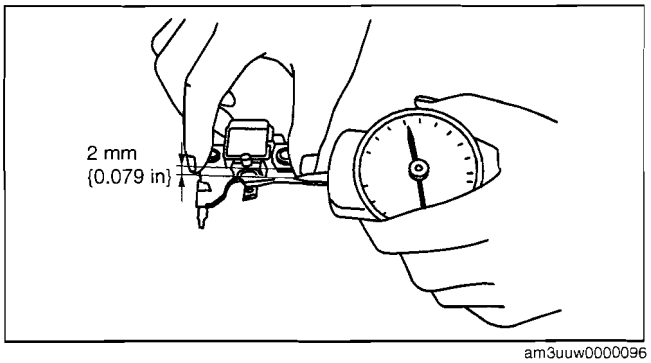
am3uuw0000096

Brush spring

1. Measure the force of the brush spring using a spring pressure gauge.
2. Read the spring pressure gauge at the brush tip projection of **2 mm {0.079 in}**.
   - Replace the brush spring if necessary.

Standard spring force
4.8—6.0 N {0.49—0.61 kgf, 1.08—1.34 lbf}

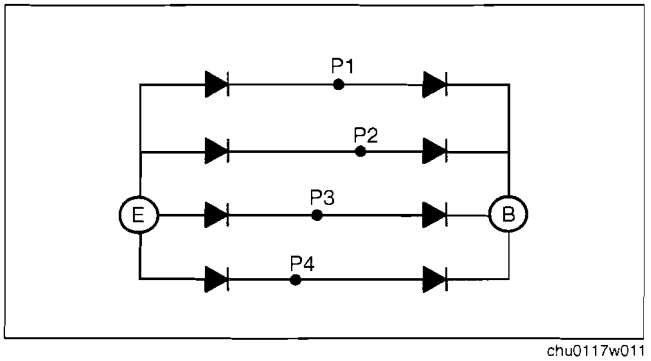
Minimum spring force
2.16 N {0.22 kgf, 0.49 lbf}



am3uuw0000096

Rectifier

1. Inspect for continuity of the diodes using a tester.

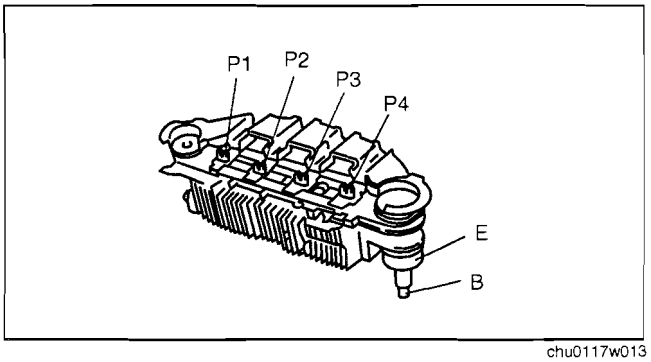


chu0117w011

- If not as specified, replace the rectifier.

Specification

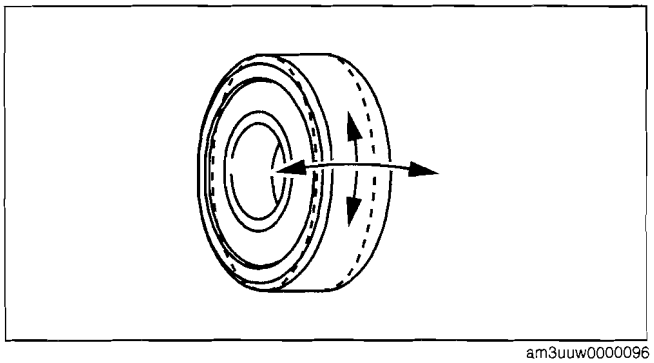
Tester		Continuity
Negative	Positive	
E	P1, P2, P3, P4	Yes
B		No
P1, P2, P3, P4	E	No
	B	Yes



chu0117w013

Bearing

1. Inspect for abnormal noise, looseness, and sticking.
   - Replace the bearing if necessary.



am3uuw0000096

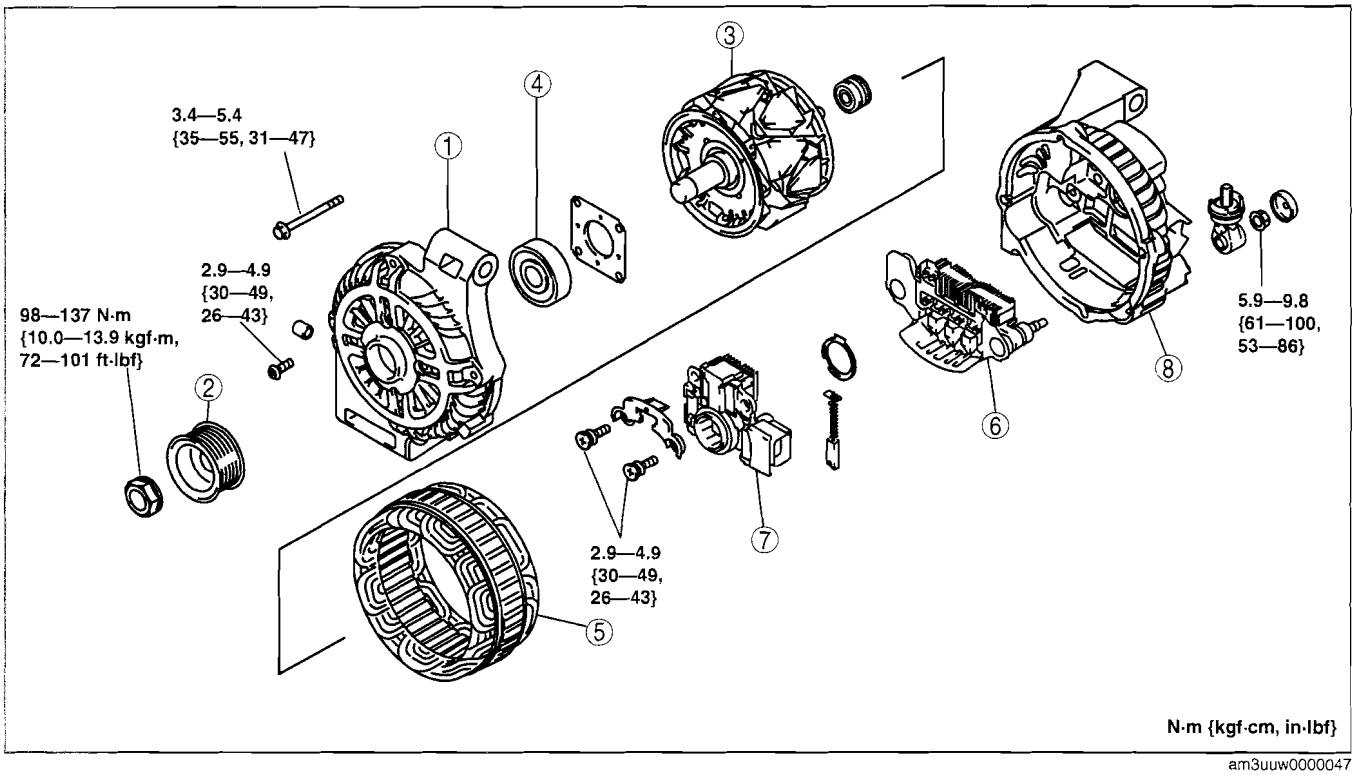
GENERATOR DISASSEMBLY/ASSEMBLY[LF, L3]

id0117a4800400

Caution

- **Melt the solder quickly, otherwise the diodes (rectifier) and regulator will be damaged by excessive heat.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000047

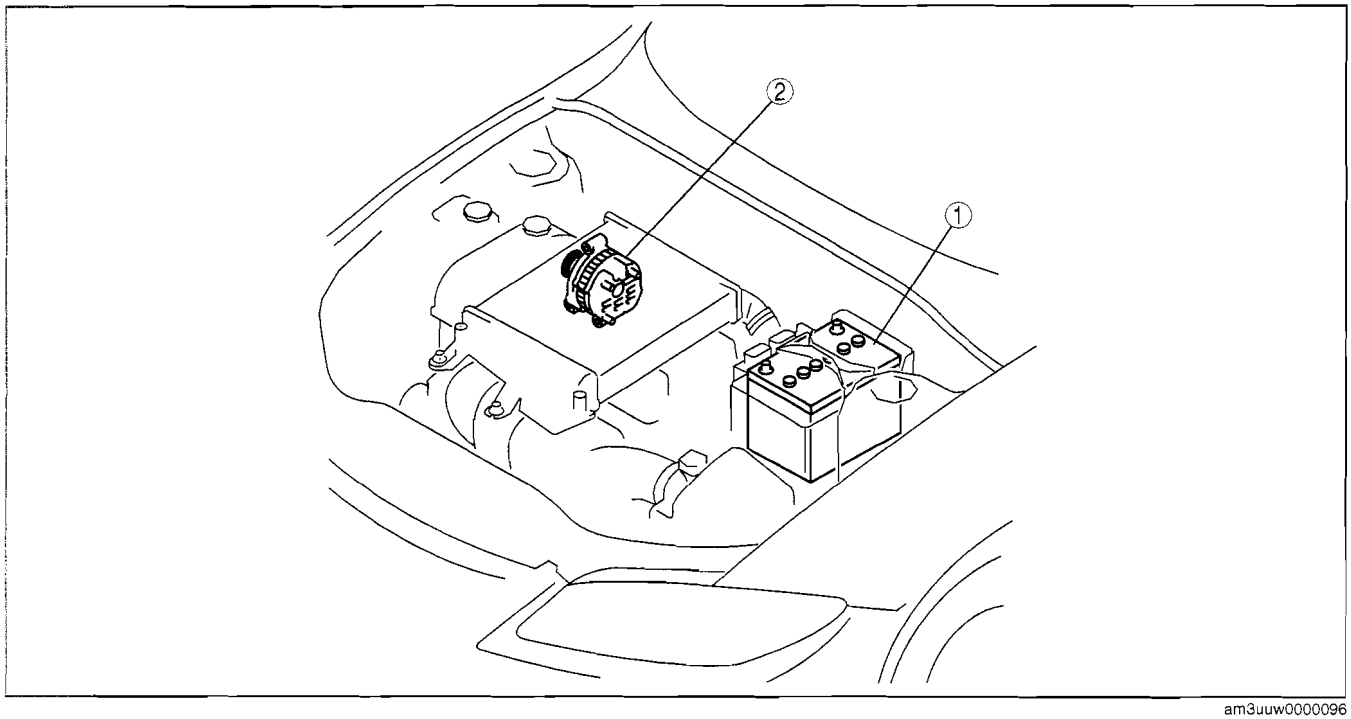
1	Front cover
2	Pulley
3	Rotor
4	Bearing

5	Stator coil
6	Rectifier
7	Brush holder
8	Rear bracket

01-17B CHARGING SYSTEM [L3 WITH TC]

CHARGING SYSTEM LOCATION INDEX[L3 WITH TC]

id011739800100



am3uuw0000096

1	Battery (See 01-17B-2 BATTERY REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-17B-4 BATTERY INSPECTION[L3 WITH TC].) (See 01-17B-5 BATTERY RECHARGING[L3 WITH TC].)

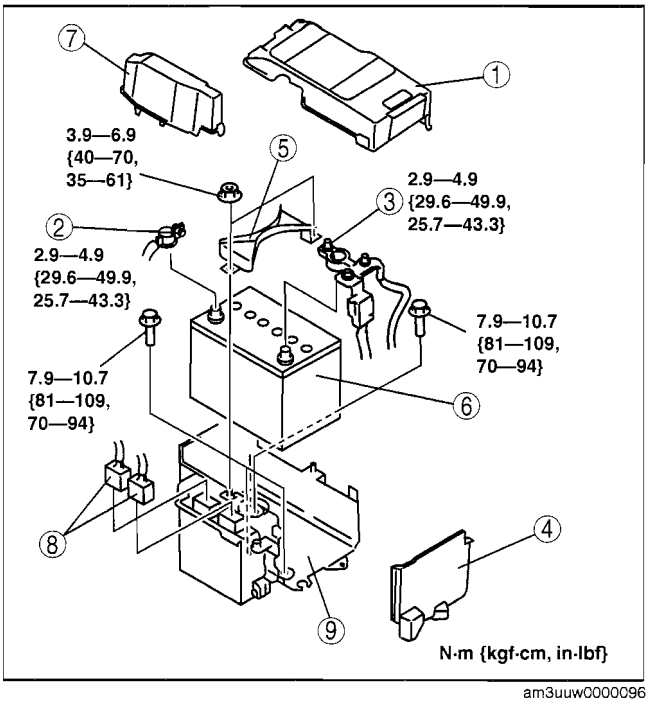
2	Generator (See 01-17B-6 GENERATOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-17B-7 GENERATOR INSPECTION[L3 WITH TC].) (See 01-17B-12 GENERATOR DISASSEMBLY/ ASSEMBLY[L3 WITH TC].)

BATTERY REMOVAL/INSTALLATION[L3 WITH TC]

id011739800500

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

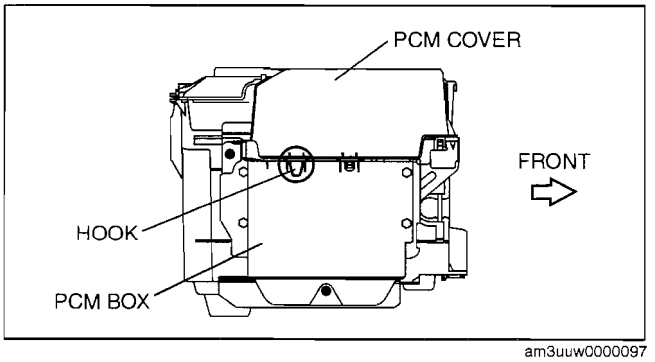
1	Battery cover (See 01-17B-3 Battery Cover Installation Note.)
2	Negative battery cable
3	Positive battery cable
4	Battery box (See 01-17B-3 Battery Box Installation Note.)
5	Battery clamp (See 01-17B-3 Battery Clamp Installation Note.)
6	Battery
7	PCM cover (See 01-17B-2 PCM Cover Installation Note.)
8	PCM connectors
9	Battery tray and PCM component



am3uuw0000096

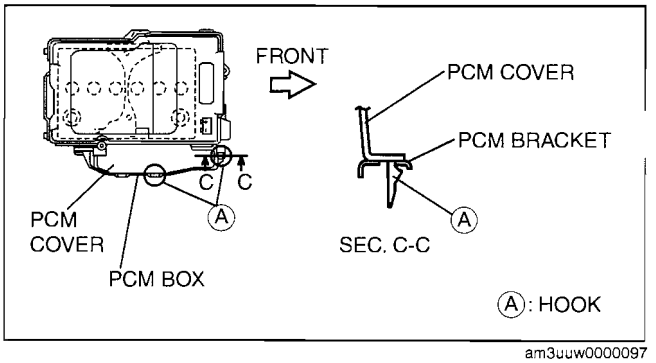
PCM Cover Installation Note

1. Install the PCM cover hook to the PCM box hole.



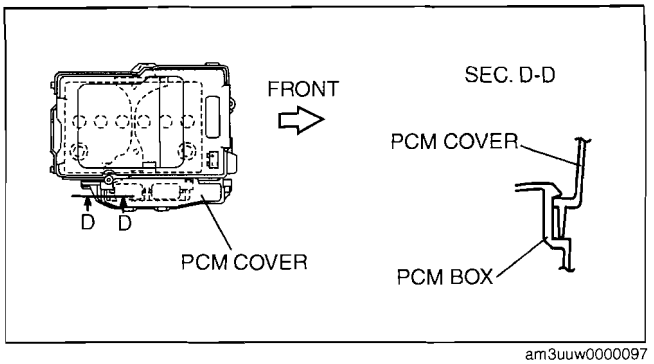
am3uuw0000097

2. Install with PCM cover hooks A aligned with the PCM box and PCM bracket holes at two points.



am3uuw0000097

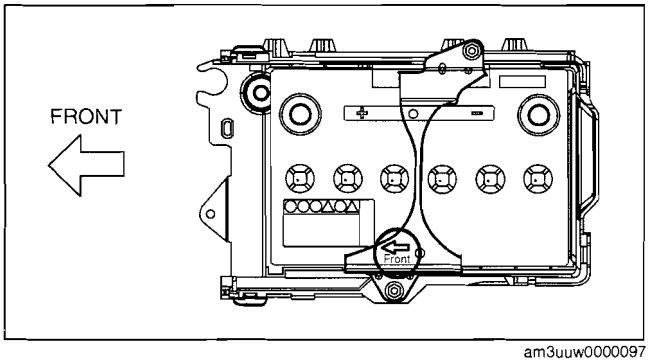
3. Install the PCM cover to the PCM box hook.



am3uuw0000097

Battery Clamp Installation Note

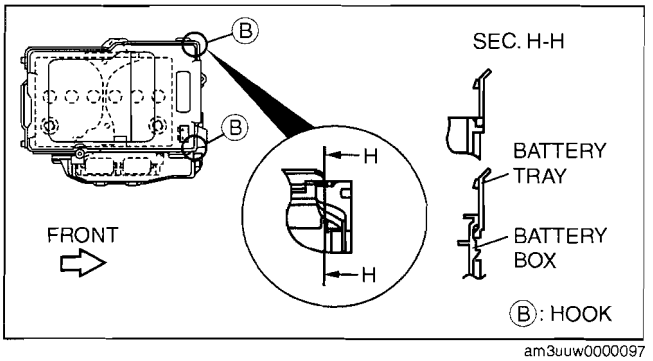
1. Assemble the battery clamp so that the arrow on it is pointed toward the front of the vehicle.



am3uuw0000097

Battery Box Installation Note

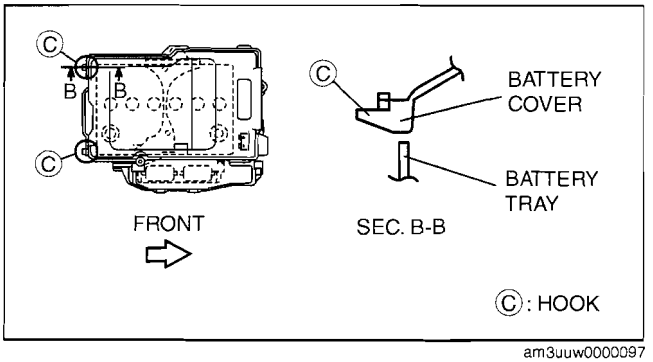
1. Assemble with battery box hooks B aligned with the battery tray holes at two points.



am3uuw0000097

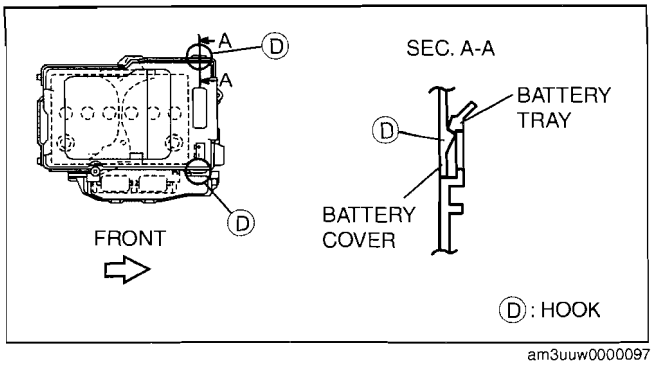
Battery Cover Installation Note

1. Install with battery cover hooks C aligned with the battery tray holes at two points.



am3uuw0000097

2. Set the battery cover to battery tray hooks D at two points.



am3uuw0000097

BATTERY INSPECTION[L3 WITH TC]

id011739800600

Warning

- **Since battery acid is toxic, be careful when handling the battery.**
- **Since battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.**
- **In case battery acid contacts skin, eyes, or clothing, flush it immediately with running water. Especially if the acid gets in the eyes, flush with water for more than 15 min and get prompt medical attention.**

Electrolyte Specific Gravity

1. Measure the electrolyte specific gravity using a hydrometer.
   - If it is less than the specification, recharge the battery. (See 01-17B-5 BATTERY RECHARGING[L3 WITH TC].)

Battery electrolyte specific gravity [20 °C {68 °F}]
1.22—1.29

Battery Voltage

1. Inspect the battery as follows:

Step	Inspection		Action
1	Measure the battery positive voltage.	12.4 V or more	Go to Step 3.
		Less than 12.4 V	Go to the next step.
2	Quick charge for **30 min** and recheck voltage.	12.4 V or more	Go to the next step.
		Less than 12.4 V	Replace the battery.
3	Using the battery load tester, apply load current (see battery load test current) and record battery voltage after **15 s**. Is voltage more than the specification?	Yes	Normal
		No	Replace the battery.

Battery load test current
55D23L (48): 180 A
80D26L (55): 195 A

Standard specification

Battery temp. (°C {°F})	Minimum voltage (V)
4 {39}	9.3
10 {50}	9.4
16 {61}	9.5
21 {70}	9.6

Back-up Current

1. Verify that the ignition switch is off (key has been removed) and that all doors are closed.
2. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Connect the tester between the negative battery terminal and negative battery cable, leave the battery undisturbed for **30 min**, and then measure the back-up current.
   - If not within the specification, measure the back-up current while removing the fuses one by one from the inside of the main fuse block and the inside of the fuse block.

Note
- If the battery is not left undisturbed for **30 min**, the tester will indicate a high value (**approx. 300 mA**).
- If the key or any electrical accessory is operated within **approx. 30 min** after the tester is connected, the battery must be left undisturbed for **approx. 30 min** from that point.

Caution
- **Operating electrical loads while the back-up current is being measured can damage the tester.**

Note
- For vehicles with the immobilizer system, the system periodically shifts synchronization of the security light flashing. Therefore, **45 mA (0.1 s)** current is supplied when the security light is illuminated, and **25 mA (2 s)** current is supplied when the security light is not illuminated. In addition, the measuring instrument, which shows the average value, indicates around **30 mA**.

Battery back-up current
Vehicles with immobilizer system: 25—45 mA
Vehicles without immobilizer system: 30 mA or less

5. Inspect and repair wiring harnesses and connectors of the fuse where the current has decreased.

BATTERY RECHARGING[L3 WITH TC]

id011739800700

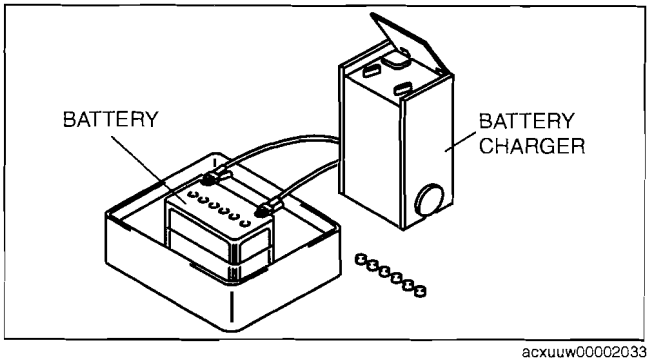
Warning
- **Keep all flames away from the battery, otherwise evaporated gas from the battery fluid may catch fire, and cause serious injury.**
- **Remove the battery filler caps when recharging to prevent battery deformation or damage.**

Caution
- **Do not quick charge for more than 30 min. It will damage the battery.**

1. Remove the battery and then place it in a pan of water.
2. Remove the battery filler caps.
3. Connect a battery charger to the battery and adjust the charging current as follows.

Battery slow charge current
55D23L (48): 4.5—5.5 A
80D26L (55): 5.5—6.5 A

Battery quick charge current [30 min]
55D23L (48): 30 A
80D26L (55): 35 A



acxuuw00002033

4. After the battery is recharged, verify that the voltage is within the specification and remains at the same value for **1 h or more** after the recharging has been completed.
   - If not within the specification, replace the battery.

Standard voltage
12.4 V or more

GENERATOR REMOVAL/INSTALLATION[L3 WITH TC]

id011739800200

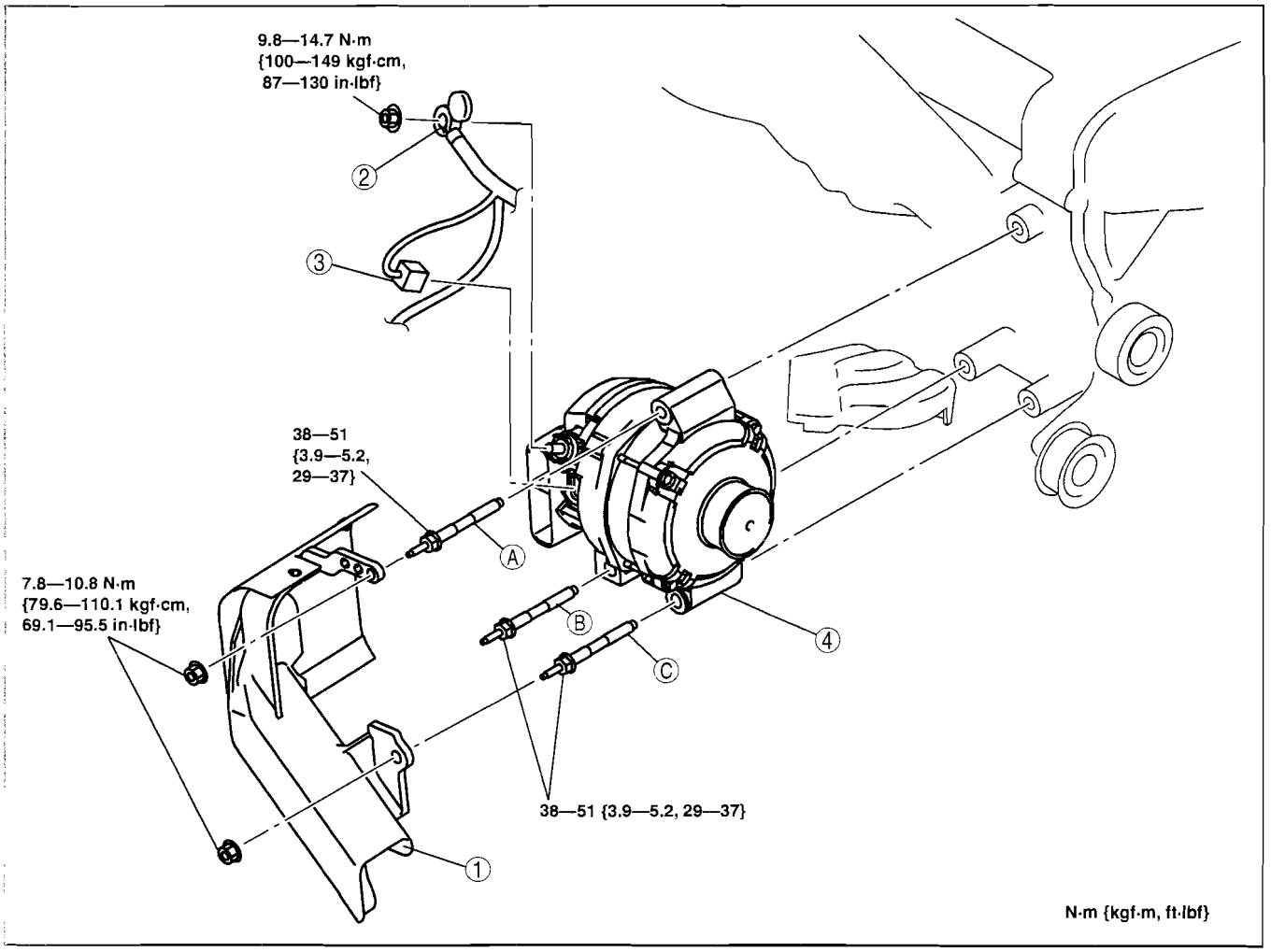
Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the negative battery cable before performing the following operation.**

Caution

- **The generator can be damaged by the heat from the exhaust manifold. Make sure the generator duct is installed securely.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler and charge air cooler bracket. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the heat insulator (body side) and exhaust manifold insulator (upper). (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the under cover and splash shield as a single unit.
6. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.



am3uuw0000030

1	Generator duct (See 01-17B-7 Generator Duct Removal Note.)
2	Terminal B cable

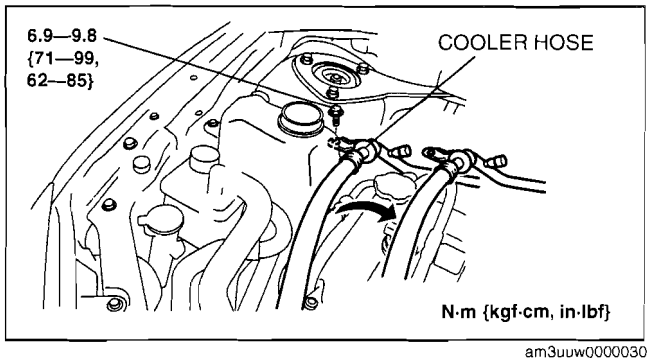
3	Generator connector
4	Generator (See 01-17B-7 Generator Removal Note.) (See 01-17B-7 Generator Installation Note.)

Generator Duct Removal Note

1. Remove the generator duct fitting nuts, and position it in the engine compartment in a location where no part can be damaged.

Generator Removal Note

1. Remove the cooler hose bracket bolt and set the cooler hose out of the way before performing the generator removal/installation.
2. Remove the generator from above the engine compartment.



am3uuw0000030

Generator Installation Note

1. Tighten bolt A temporarily.
2. Tighten bolt B, C to the specified tightening torque.
3. Tighten bolt A to the specified tightening torque.

GENERATOR INSPECTION[L3 WITH TC]

id011739800300

Caution

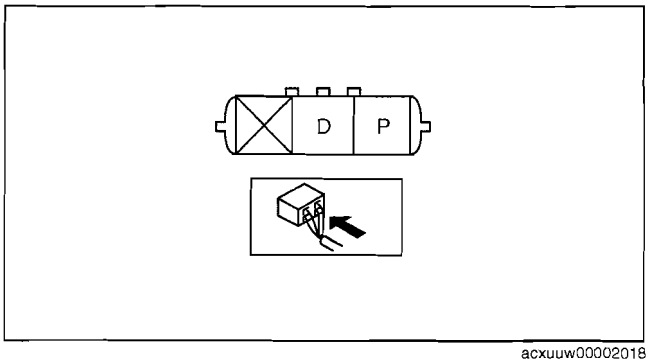
- **Do not apply direct battery positive voltage to generator terminal D, otherwise it could cause damage to the internal parts (power transistor) of the generator.**

Generator Warning Light

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10B-3 DRIVE BELT INSPECTION[L3 WITH TC].)
3. With the ignition switch turned to the ON position, verify that the generator warning light illuminates.
   - If it does not illuminate, inspect the generator warning light and the wiring harness.
     — If the generator warning light and the wiring harness are normal, inspect the PCM.
4. Verify that the generator warning light goes out after the engine is started.
   - If it does not go out, inspect if any one of the following DTCs in the on-board diagnostic system are displayed: P0112, P0113, P2502, P2503, P2504. (See 01-02B-14 DTC TABLE[L3 WITH TC].)

Generator
Voltage

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10B-3 DRIVE BELT INSPECTION[L3 WITH TC].)
3. Turn off all electrical loads.
4. Start the engine.
5. Verify that the generator rotates smoothly without any noise while the engine is running.
   - If there is any noise, find the cause and repair or replace the generator.
6. Measure the voltage at each terminal using a tester.
   - If it is not as specified, find the cause and repair or replace the applicable part.



acxuuw00002018

Generator standard voltage [IG-ON]
Terminal B: B+
Terminal P: Approx. 1 V or less
Terminal D: Approx. 0 V

Generator standard voltage [Idle, 20 °C {68 °F}]
Terminal B: 13—15 V
Terminal P: Approx. 3—8 V
Terminal D: Turn the electrical loads (headlights, blower motor, rear window defroster) on and verify that the voltage reading increases.

Current

Note
- Since the charging current decreases rapidly after starting the engine, carry out the following procedure quickly, and read the maximum current value.

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See 01-10B-3 DRIVE BELT INSPECTION[L3 WITH TC].)
3. Disconnect the negative battery cable.
4. Connect a tester, which can read **120 A or more**, between generator terminal B and the wiring harness.
5. Connect the negative battery cable.
6. Turn off all electrical loads.
7. Start the engine.
8. Increase engine speed to **2,500 rpm.**

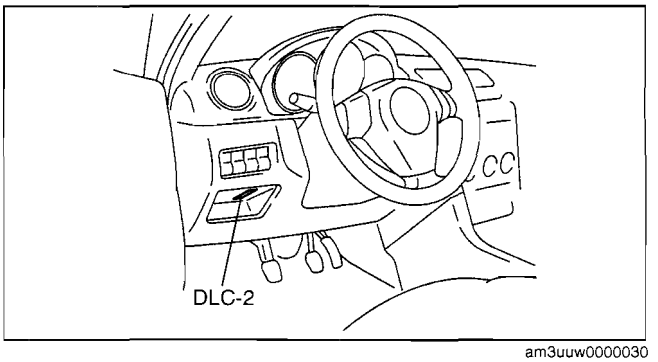
Note
- When the electrical load on the vehicle is low, the specified current cannot be verified although the generator is normal. In this case, increase the electrical load (Leave the headlights turned on for a while, then discharge the battery, or use a similar method.) and recheck.
- When the generator itself or the ambient temperature are too high, the specified current also cannot be verified. In this case, cool down the generator and recheck.

9. Turn the following electrical loads on and verify that the current reading increases more than the minimum value indicated below.
   — If it is not as specified, go to the PCM and generator shearing inspection. (See 01-17B-8 PCM and generator shearing inspection.)
   - Headlights (high-beam)
   - Blower motor (HI)
   - Rear window defroster
   - Brake lights

Generator generated current minimum value
70 % of the nominal output current (nominal output current: 110 A)
[Ambient temp. 20 °C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]

PCM and generator shearing inspection

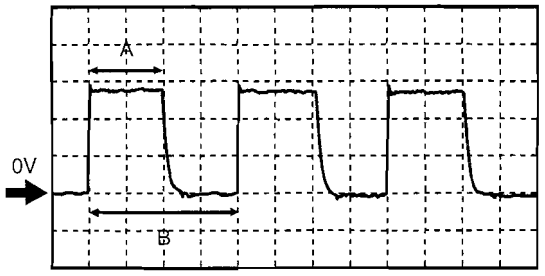
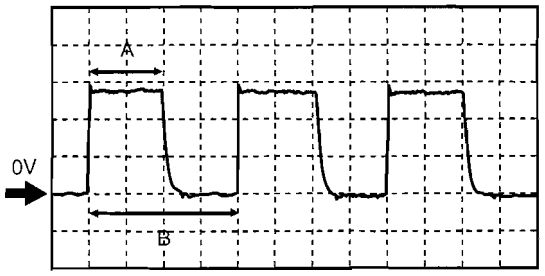
1. Connect the M-MDS to the DLC-2.



am3uuw0000030

2. Inspect as follows:

Step	Inspection		Action
1	Measure the generator terminal B voltage when the electrical loads*1 are on and off.	15 V or more	Go to Step 2.
		13—15 V	Normal*2
		13 V or less	Go to Step 3.
2	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ using a tester. Is the voltage between 13 and 15 V ?	Yes	Go to Step 4.
		No	PCM input error.
3	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ using a tester. Is the voltage between 13 and 15 V ?	Yes	Go to Step 5.
		No	PCM input error.

Step	Inspection		Action
4	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI using an oscilloscope. Is the duty value 100 % ?	 $\frac{A}{B}$ x 100 (%) = DUTY (%)	Yes: PCM input error. No: PCM, generator, or both are not normal.
5	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI using an oscilloscope. Is the duty value 0 % ?	 $\frac{A}{B}$ x 100 (%) = DUTY (%)	Yes: PCM input error. No: PCM, generator, or both are not normal.

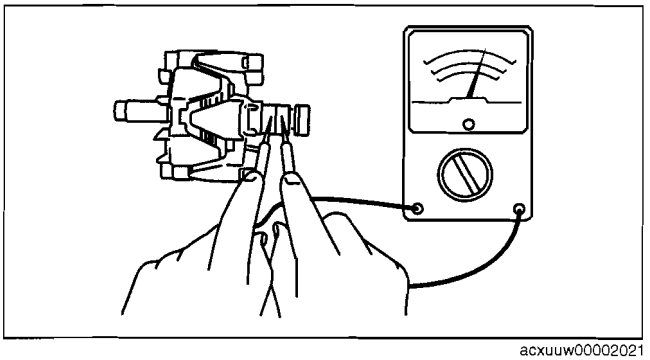
*1 : Headlights, blower motor, rear window defroster, and brake lights.
*2 : If the generator field coil duty value does not change when electrical loads (such as headlights, blower motor, rear window defroster, brake lights) are on or off, inspection with discharged battery is needed.

Generator Inner Parts

Rotor

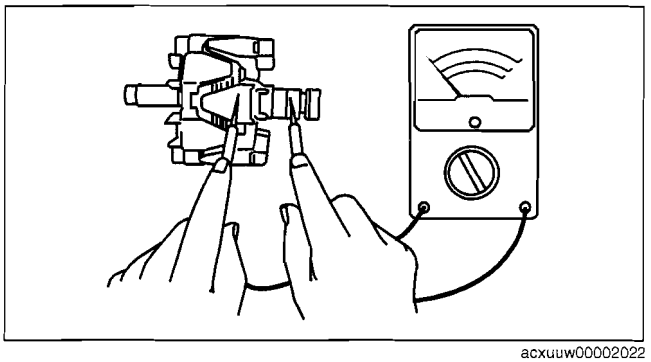
1. Measure the resistance between the slip rings using a tester.
   - If not within the specification, replace the rotor.

   Generator rotor resistance (between slip rings) [20 °C {68 °F}]
   2.0—2.3 ohm



acxuuw00002021

2. Verify that there is no continuity between the slip ring and core using a tester.
   - If there is continuity, replace the rotor.
3. Inspect the slip ring surface condition.
   - If the slip ring surface is rough, use a lathe or fine sandpaper to smooth it.



acxuuw00002022

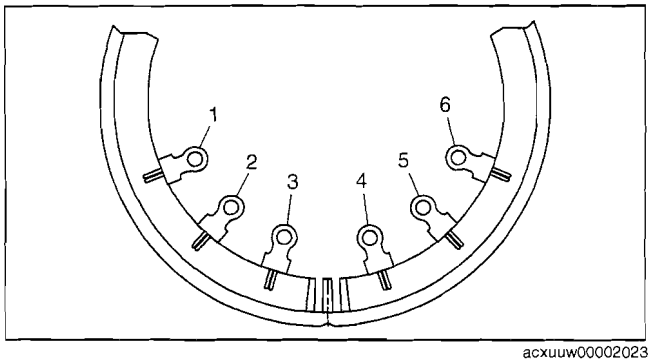
Stator coil

1. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, replace the stator.

O—O : Continuity

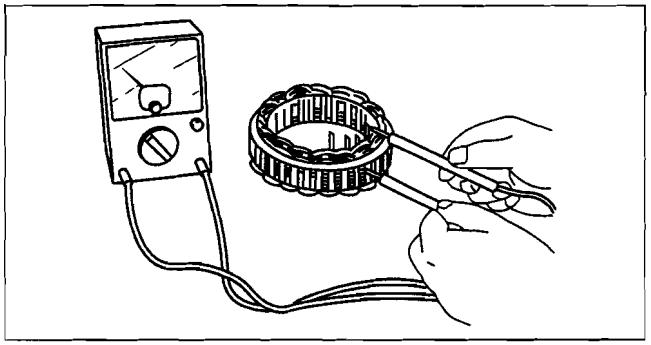
Terminal					
1	2	3	4	5	6
O—O					
O—		—O			
	O—	—O			
			O—	—O	
			O—	——	—O
				O—	—O

acxuuw00002024



acxuuw00002023

2. Verify that there is no continuity between the stator coil leads and core using a tester.
   - If there is continuity, replace the stator coil.

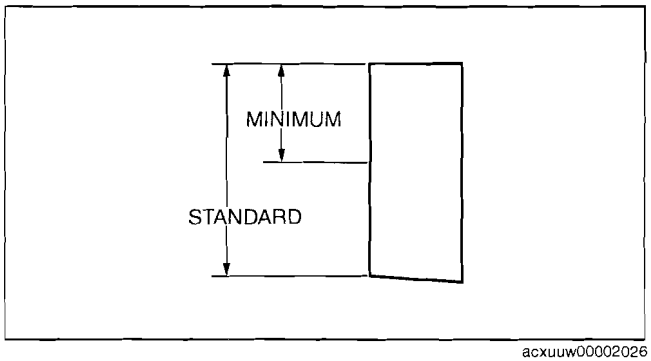


acxuuw00002025

Brush

1. Inspect brushes for wear.
   - If any brush is worn almost to or beyond the limit, replace all of the brushes.

Generator brush length
Standard: 22.5 mm {0.89 in}
Minimum: 5.0 mm {0.20 in}

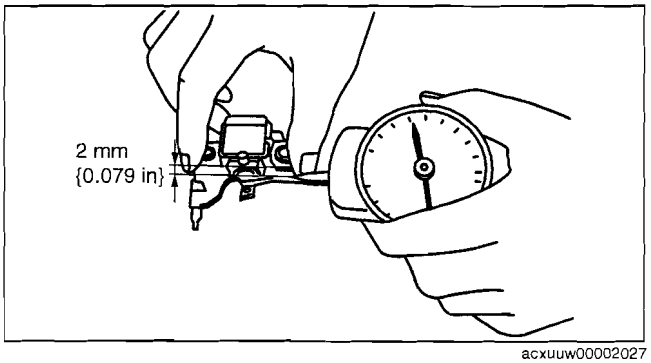


acxuuw00002026

Brush spring

1. Measure the force of the brush spring using a spring pressure gauge.
2. Read the spring pressure gauge at the brush tip projection of **2 mm {0.079 in}**.
   - Replace the brush spring if necessary.

Generator brush spring force
Standard: 4.1—5.3 N {0.42—0.54 kgf, 0.92—1.19 lbf}
Minimum: 1.7 N {0.17 kgf, 0.38 lbf}



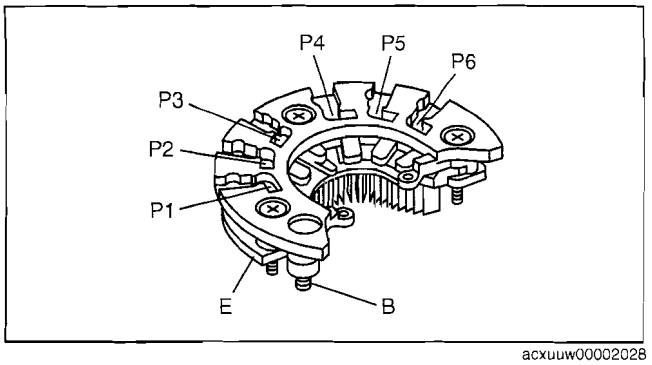
acxuuw00002027

Rectifier (Using an analog circuit tester)

1. Inspect for continuity of the diodes using an analog circuit tester.
   - If not as specified, replace the rectifier.

Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	Yes
B		No
P1, P2, P3, P4, P5, P6	E	No
	B	Yes



acxuuw00002028

Rectifier (Using a digital circuit tester)

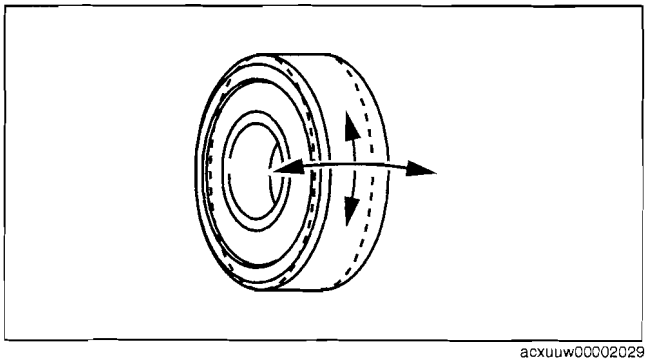
1. Inspect for continuity of the diodes using a digital circuit tester.
   - If not as specified, replace the rectifier.

Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	No
B		Yes
P1, P2, P3, P4, P5, P6	E	Yes
	B	No

Bearing

1. Inspect for abnormal noise, looseness, and sticking.
   - Replace the bearing if necessary.



acxuuw00002029

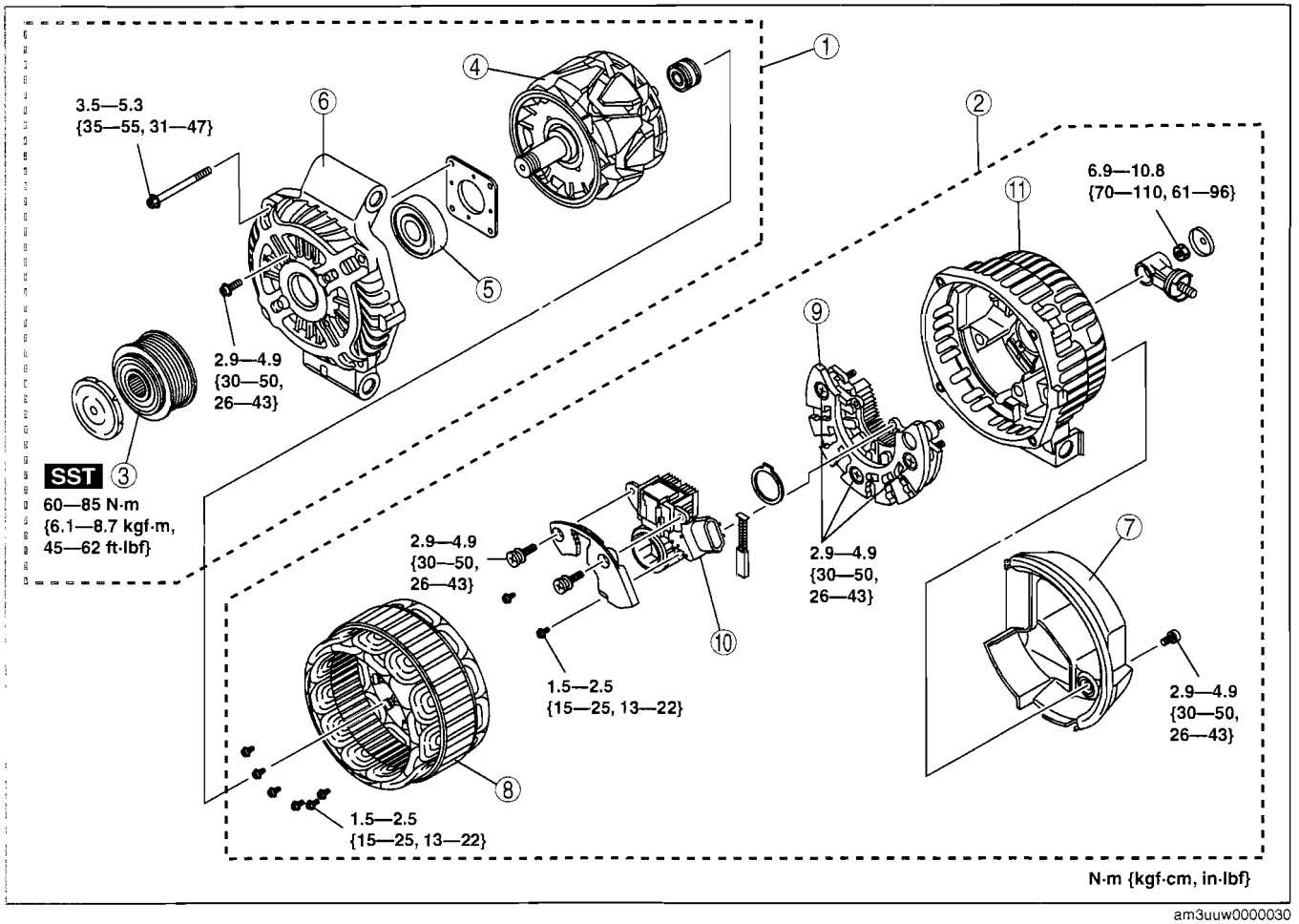
GENERATOR DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id011739800400

Caution

- **Melt the solder quickly, otherwise the diodes (rectifier) and regulator will be damaged by excessive heat.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000030

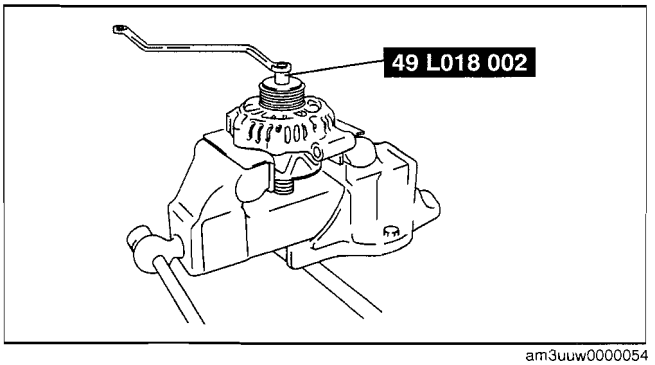
1	Rotor component
2	Stator coil component
3	Pulley (See 01-17B-12 Pulley Disassembly/Assembly Note.)
4	Rotor
5	Bearing

6	Front cover
7	Generator heat insulator
8	Stator coil
9	Rectifier
10	Brush holder
11	Rear bracket

Pulley Disassembly/Assembly Note

1. Disassemble/assemble the pulley using the **SST**.

Tightening torque
60—85 N·m {6.1—8.7 kgf·m, 45—62 ft·lbf}

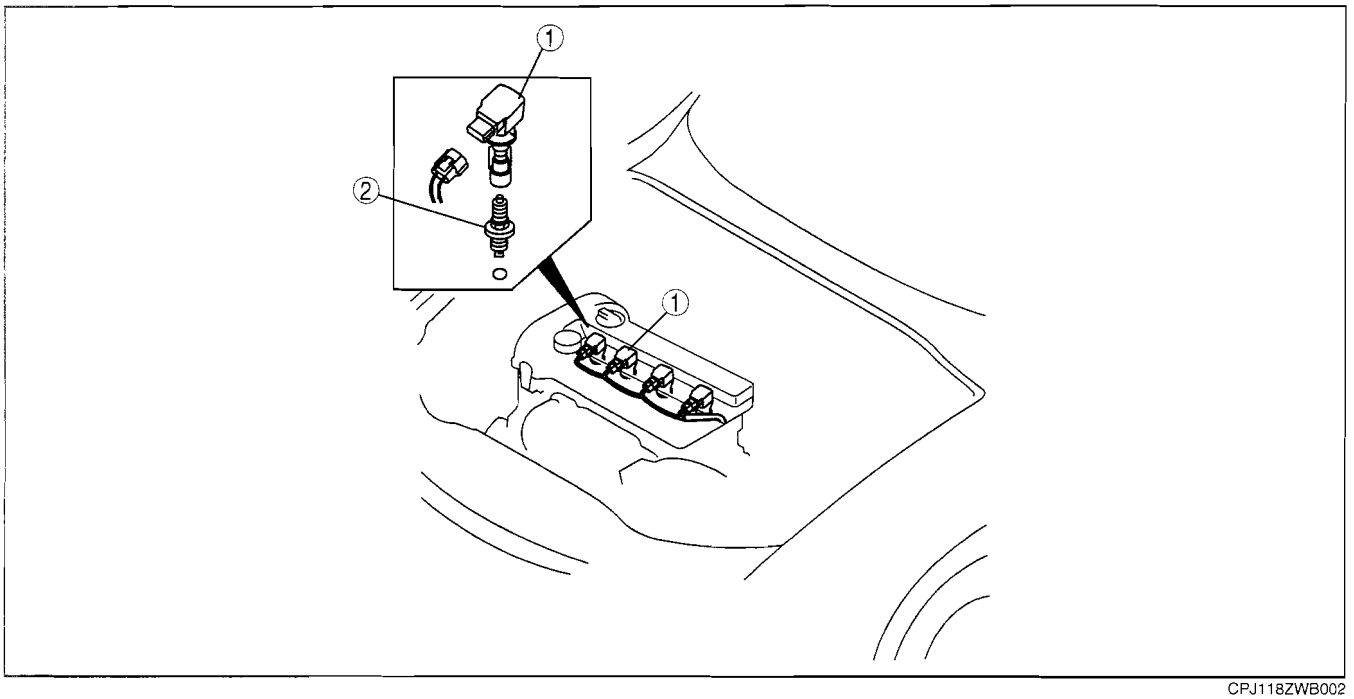


am3uuw0000054

01-18A IGNITION SYSTEM [LF, L3]

IGNITION SYSTEM LOCATION INDEX[LF, L3]

id0118a5800100



CPJ118ZWB002

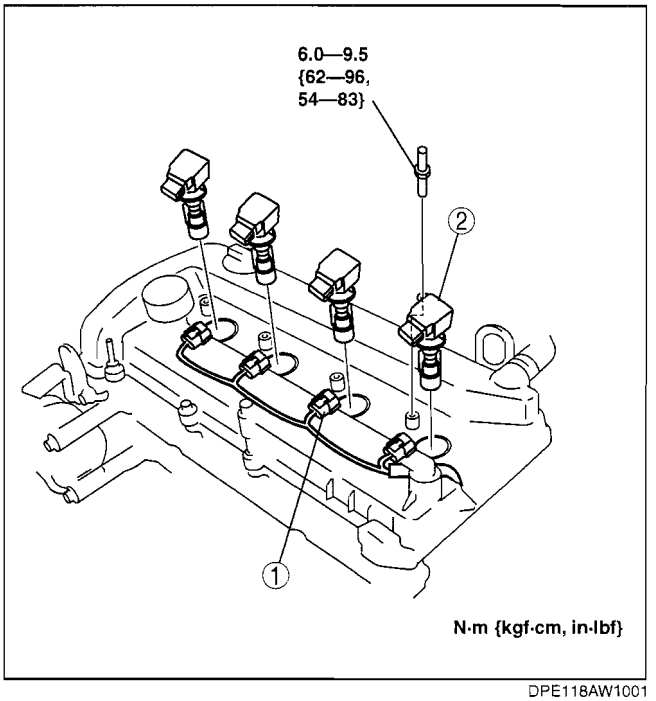
1	Ignition coil (See 01-18A-2 IGNITION COIL REMOVAL/ INSTALLATION[LF, L3].) (See 01-18A-2 IGNITION COIL INSPECTION[LF, L3].)
2	Spark plug (See 01-18A-3 SPARK PLUG REMOVAL/ INSTALLATION[LF, L3].) (See 01-18A-3 SPARK PLUG INSPECTION[LF, L3].)

IGNITION COIL REMOVAL/INSTALLATION[LF, L3]

id0118a5800200

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

1	Connector
2	Ignition coil



DPE118AW1001

IGNITION COIL INSPECTION[LF, L3]

id0118a5800300

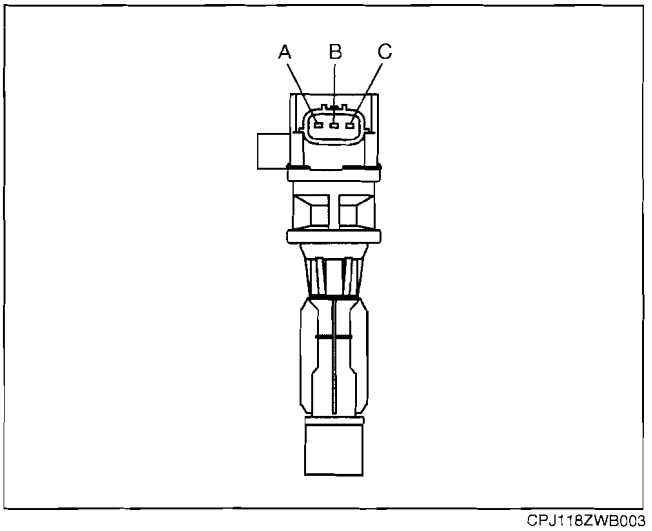
Ignition Coil Inspection

1. Perform the spark test and identify the malfunctioning cylinder.
2. Replace the ignition coil of the malfunctioning cylinder with that of a normal cylinder, and reperform the spark test.
   - If the spark is not normal due to a malfunctioning ignition coil, replace that ignition coil.
   - It is unlikely that all four ignition coils fail to operate properly. To prevent replacing a normal component, perform the above procedure, identify the malfunctioning ignition coil, and replace it.

Ignition Coil with Built-In Igniter Inspection

1. Disconnect the ignition coil connector.
2. Measure the resistance between each terminal on the ignition coil connector using an analog circuit tester.
   - If the measurement corresponds to the table, replace the ignition coil.

Item	Tester Connection Position		Condition
	Positive	Negative	
Terminal	C	A	0 ohm is not normal (∞ ohm is normal)
	A	C	
	C	B	
	B	C	
	A	B	∞ or 0 ohm is not normal (several kilohm is normal)
	B	A	



CPJ118ZWB003

SPARK PLUG REMOVAL/INSTALLATION[LF, L3]

id0118a5800400

Caution

- **If a spark plug that is not as specified is installed, engine performance will be deteriorated. Install only the specified spark plug when replacing.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the plug hole plate. (See 01-10A-3 PLUG HOLE PLATE REMOVAL/INSTALLATION[LF, L3].)
4. Remove the ignition coils. (See 01-18A-2 IGNITION COIL REMOVAL/INSTALLATION[LF, L3].)
5. Remove the spark plugs using a plug-wrench.
6. Install in the reverse order of removal.

Tightening torque

10—14 N·m {1.1—1.4 kgf·m, 8—10 ft·lbf}

SPARK PLUG INSPECTION[LF, L3]

id0118a5800500

Specification

Spark plug type

LFG1 18 110 (ILTR5A-13G), L3Y2 18 110

Plug Gap Inspection

Caution

- **To avoid possible damage to the tip, do not adjust the plug gap.**
- **To prevent damaging the tip, use a wire type plug gap gauge when inspecting the plug gap.**

1. Measure the spark plug gap using a wire type plug gap gauge.
   - If it exceeds the specification, replace the spark plug.

Standard plug gap
1.25—1.35 mm {0.050—0.053 in}

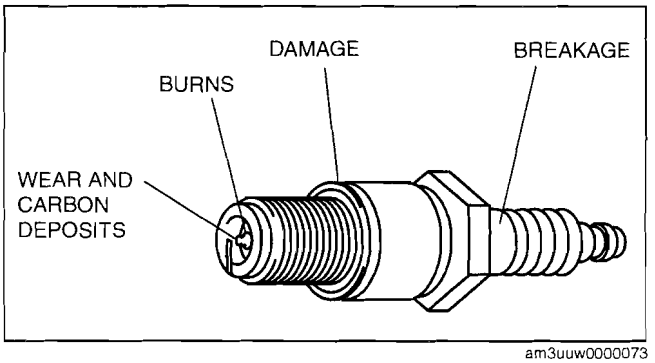
Cleaning

Caution
- **Carbon may adhere to the tip of the spark plug during vehicle delivery or repeated short distance driving during the winter time. If there is any malfunction such as rough idling or start difficulty due to carbon adhesion causing plug fouling, burn off the carbon by performing no-load racing of the engine.**
- **When performing the no-load racing, apply the side brake and foot brake, move the shift lever to neutral (MTX), or the selector lever to P position (ATX) to prevent an accident and serious injury.**
- **To avoid possible damage to the spark plug tip, do not use a wire brush for cleaning.**

Note
- To avoid possible damage to the tip, use gasoline to clean the spark plugs after removing dirt.
- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

1. If there is carbon adhering to the spark plug, perform no-load racing at **4,000 rpm** for **2 min**, **2 times**.

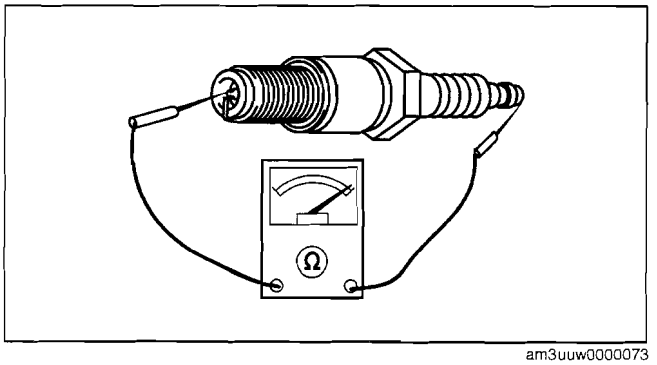
Visual inspection
1. Inspect the following items:
   - If any of the following malfunction are indicated, replace the spark plug.
     — Insulator breakage
     — Worn electrode
     — Damaged gasket
     — Badly burned insulator (sparking side)



am3uuw0000073

Resistance Inspection
1. Measure the resistance of the spark plug using a tester as shown in the figure.
   - If not within the specification, replace the spark plug.

Resistance
3.0—7.5 kilohms [25°C {77 °F}]

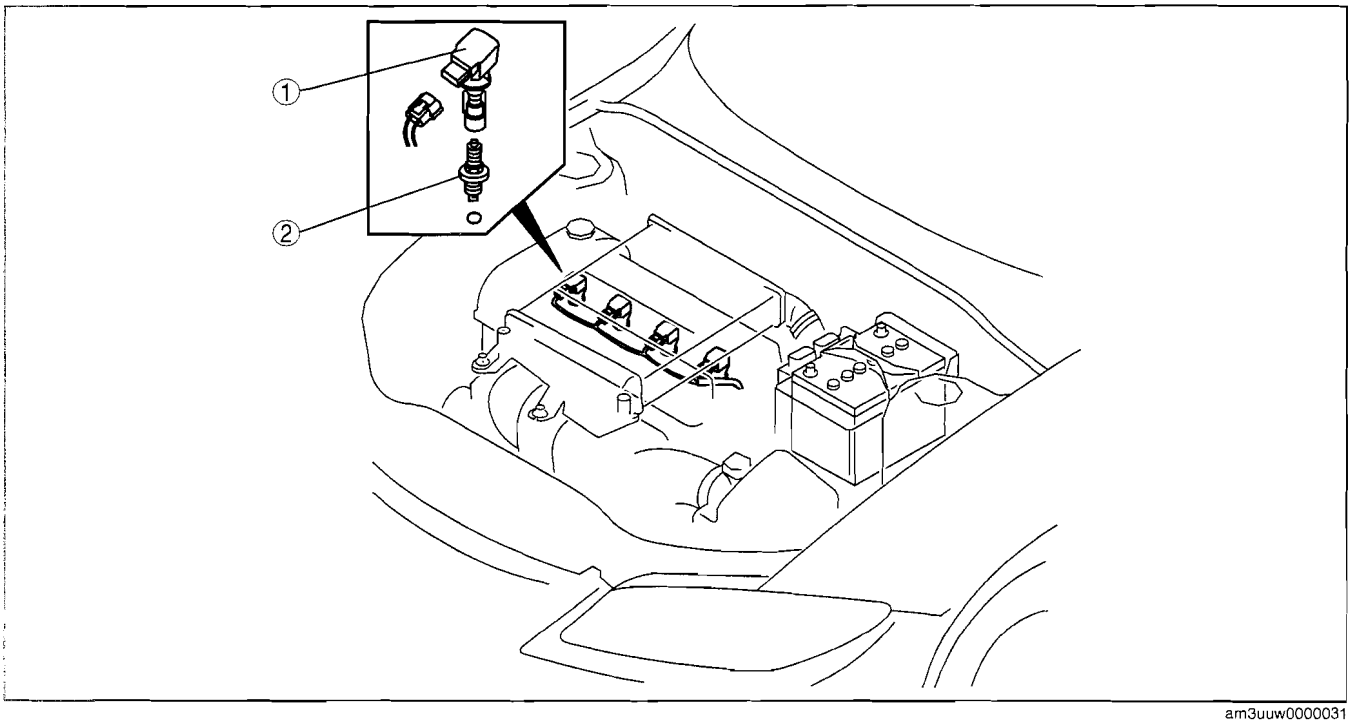


am3uuw0000073

01-18B IGNITION SYSTEM [L3 WITH TC]

IGNITION SYSTEM LOCATION INDEX[L3 WITH TC]

id011839800100



am3uuw0000031

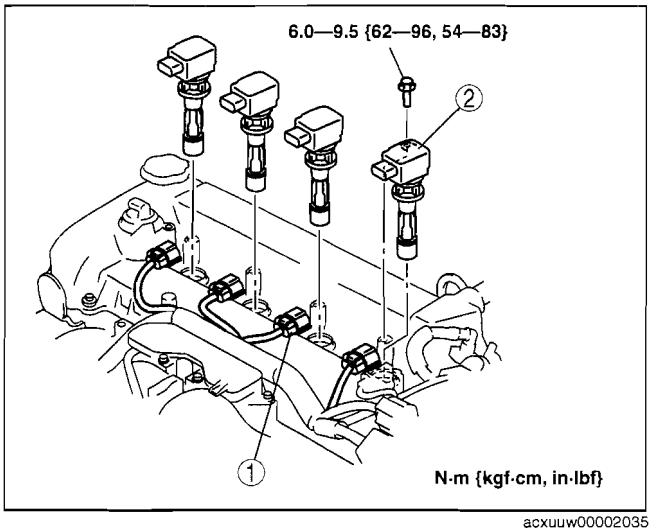
1	Ignition coil (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-18B-2 IGNITION COIL INSPECTION[L3 WITH TC].)
2	Spark plug (See 01-18B-3 SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC].) (See 01-18B-4 SPARK PLUG INSPECTION[L3 WITH TC].)

IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC]

id011839800200

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

1	Connector
2	Ignition coil



acxuuw00002035

IGNITION COIL INSPECTION[L3 WITH TC]

id011839800300

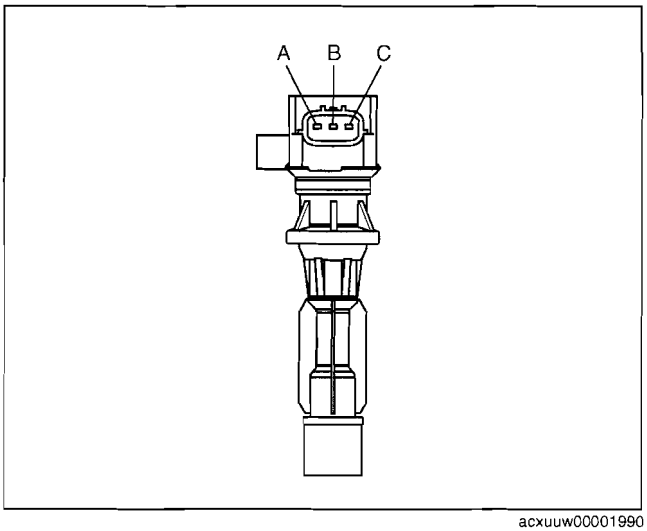
Ignition Coil Inspection

1. Perform the spark test and identify the malfunctioning cylinder.
2. Replace the ignition coil of the malfunctioning cylinder with that of a normal cylinder, and reperform the spark test.
   - If the spark is not normal due to a malfunctioning ignition coil, replace that ignition coil.
   - It is unlikely that all four ignition coils fail to operate properly. To prevent replacing a normal component, perform the above procedure, identify the malfunctioning ignition coil, and replace it.

Ignition Coil with Built-in Igniter Inspection

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Disconnect the ignition coil connector.
5. Measure the resistance between each terminal on the ignition coil connector using an analog circuit tester.
   - If the measurement corresponds to the table, replace the ignition coil.

Item	Tester Connection Position		Condition
	Positive	Negative	
Terminal	A	C	0 ohm is not normal (∞ ohm is normal)
	B	C	
	A	B	∞ or 0 ohm is not normal (several kilohm is normal)



acxuuw00001990

SPARK PLUG REMOVAL/INSTALLATION[L3 WITH TC]

id011839800400

Caution

- **If a spark plug that is not as specified is installed, engine performance will be deteriorated. Install only the specified spark plug when replacing.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the ignition coils. (See 01-18B-2 IGNITION COIL REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the spark plugs using a plug-wrench.
6. Install in the reverse order of removal.

Tightening torque

10—14 N·m {1.1—1.4 kgf·m, 8.0—10 ft·lbf}

SPARK PLUG INSPECTION[L3 WITH TC]

id011839800500

Specification

Spark plug type
L3K9 18 110A, L3Y3 18 110

Plug Gap Inspection

Caution
- **To avoid possible damage to the tip, do not adjust the plug gap.**
- **To prevent damaging the tip, use a wire type plug gap gauge when inspecting the plug gap.**

1. Measure the spark plug gap using a wire type plug gap gauge.
   - If not within the specification, replace the spark plug.

Spark plug gap
0.7—0.8 mm {0.028—0.031 in}

Cleaning

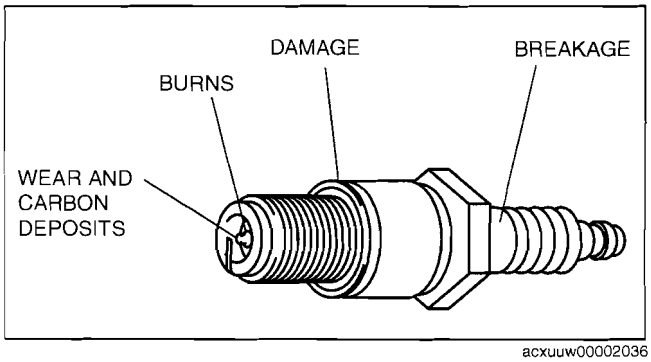
Caution
- **Carbon may adhere to the tip of the spark plug during vehicle delivery or repeated short distance driving during the winter time. If there is any malfunction such as rough idling or start difficulty due to carbon adhesion causing plug fouling, burn off the carbon by performing no-load racing of the engine.**
- **When performing the no-load racing, apply the side brake and foot brake, move the shift lever to neutral to prevent an accident and serious injury.**
- **To avoid possible damage to the spark plug tip, do not use a wire brush for cleaning.**

Note
- To avoid possible damage to the tip, use gasoline to clean the spark plugs after removing dirt.
- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

1. If there is carbon adhering to the spark plug, perform no-load racing at **4,000 rpm** for **2 min**, **2 times**.

Visual Inspection

1. Inspect the following items:
   - If any of the following malfunctions are indicated, replace the spark plug.
     — Insulator breakage
     — Worn electrode
     — Damaged gasket
     — Badly burned insulator (sparking side)

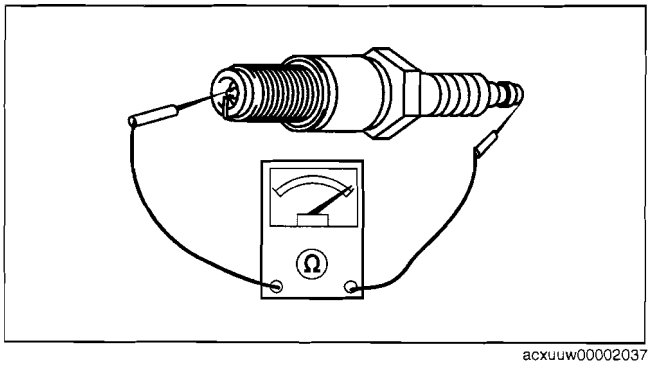


acxuuw00002036

Resistance Inspection

1. Measure the resistance of the spark plug using a tester as shown in the figure.
   - If not within the specification, replace the spark plug.

Spark plug resistance [25°C {77 °F}]
3.0—7.5 kilohms

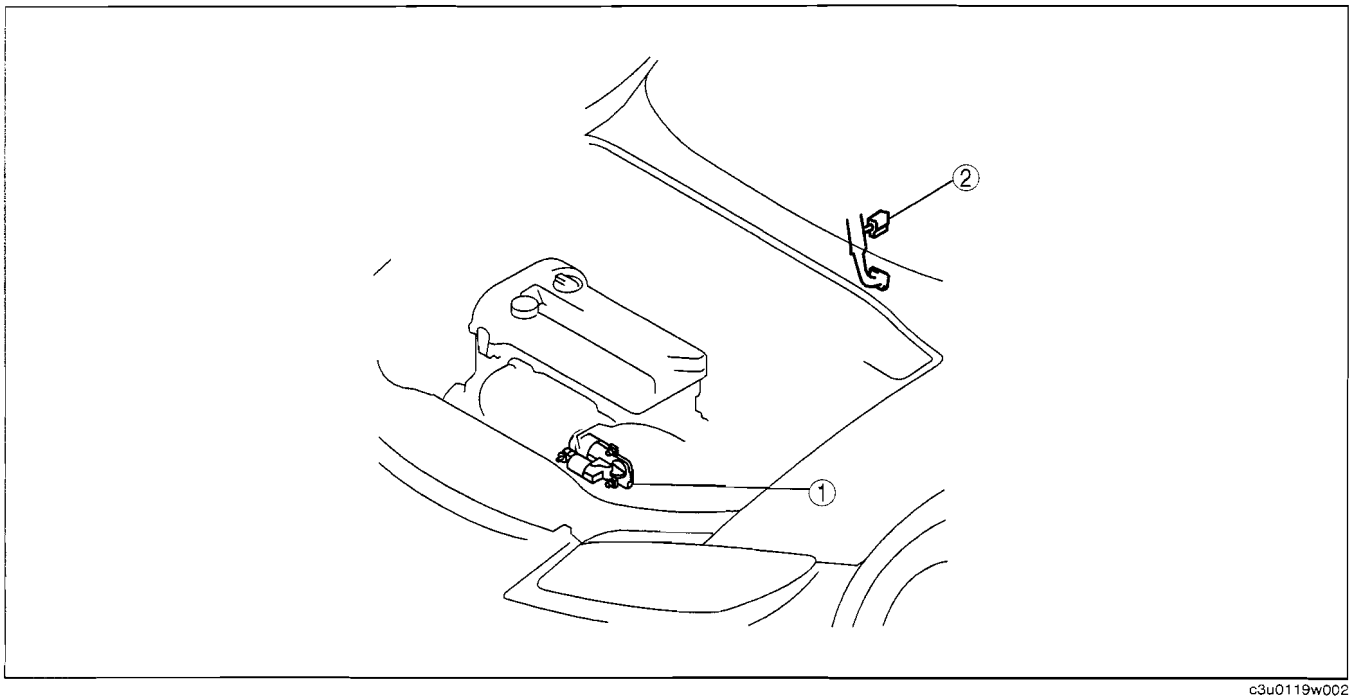


acxuuw00002037

01-19A STARTING SYSTEM [LF, L3]

STARTING SYSTEM LOCATION INDEX[LF, L3]

id0119a4800100



c3u0119w002

1	Starter (See 01-19A-2 STARTER REMOVAL/ INSTALLATION[LF, L3].) (See 01-19A-3 STARTER INSPECTION[LF, L3].) (See 01-19A-7 STARTER DISASSEMBLY/ ASSEMBLY[LF, L3].)

2	Starter interlock switch (MTX) (See 01-19A-7 STARTER INTERLOCK SWITCH INSPECTION (MTX)[LF, L3].)

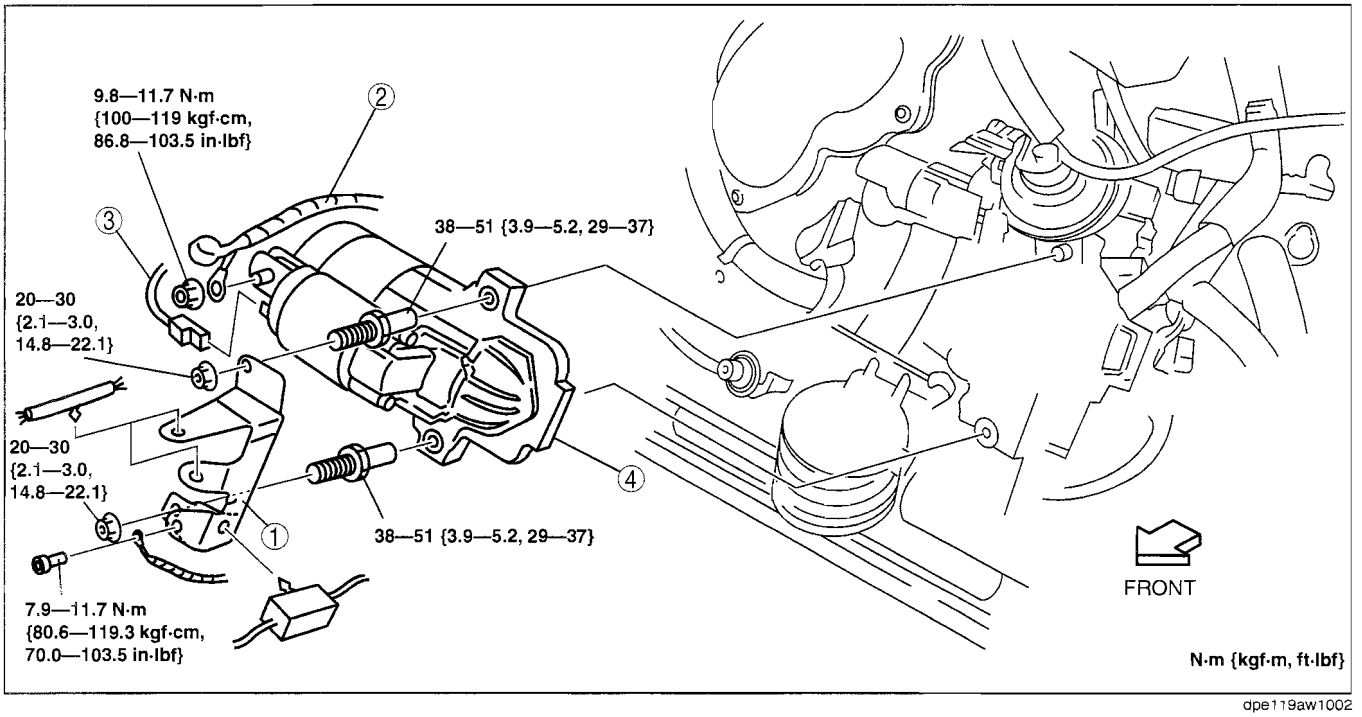
STARTER REMOVAL/INSTALLATION[LF, L3]

id0119a4800200

Warning

- **When the battery cables are connected, touching the vehicle body with starter terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the negative battery cable before performing the following operation.**

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the clutch release cylinder with the pipe still connected. (MTX) (See 05-15A-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



dpe119aw1002

1	Wiring harness bracket
2	Terminal B cable
3	Terminal S connector
4	Starter

STARTER INSPECTION[LF, L3]

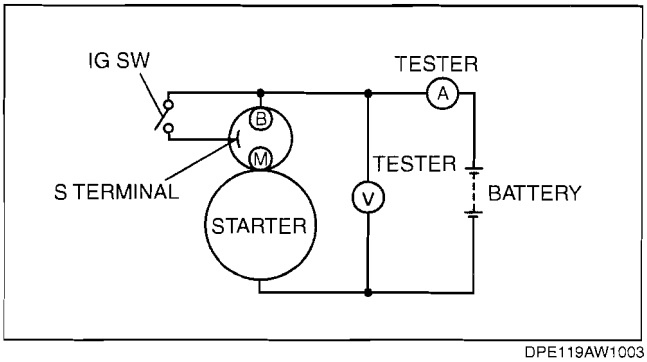
id0119a4800300

On-vehicle Inspection

1. Verify that the battery is fully charged.
2. The starter is normal if it rotates smoothly and without any noise when the engine is cranked.
   - If the starter does not operate, inspect the following:
     — Remove the starter, and inspect the starter unit.
     — Inspect the related wiring harnesses, the ignition switch, and the transaxle range switch (ATX).

No-load test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, and a tester as shown in the figure.
3. Operate the starter and verify that it rotates smoothly.
   - If the starter does not rotate smoothly, inspect the starter unit.
4. Measure the voltage and current while the starter is operating.
   - If not within the specification, replace the starter.



DPE119AW1003

Standard current

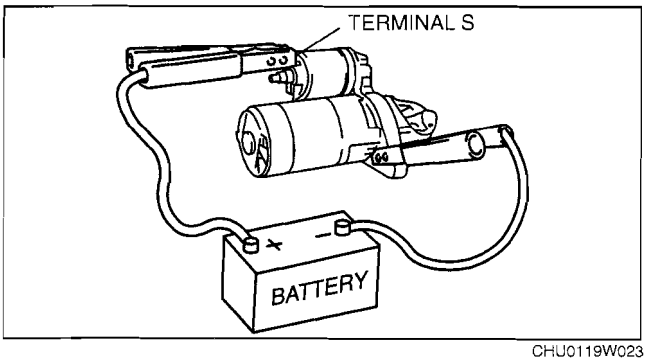
Item	
Voltage (V)	Current (A)
11	90 or less

Magnetic Switch Operation Inspection
Pull-out test

Note

- Depending on the battery charge condition, the starter motor pinion may rotate while in an extended state. This is due to current flowing to the starter motor through the pull-in coil to turn the starter motor, and does not indicate an abnormality.

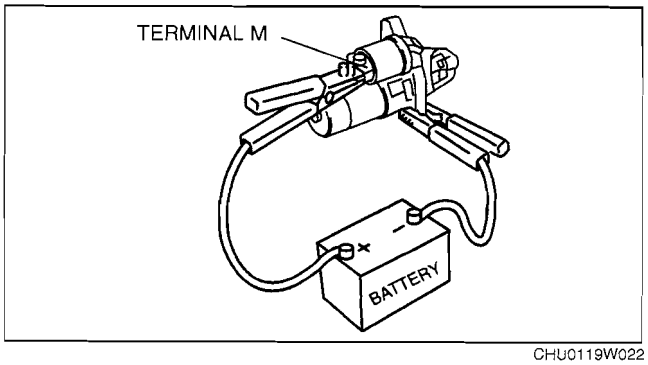
1. Verify that the starter motor pinion is extended while battery positive voltage is connected to terminal S and the starter body is grounded.
   - If the starter motor pinion is not extended, repair or replace the starter.



CHU0119W023

Return test

1. Disconnect the motor wire from terminal M.
2. Connect battery positive voltage to terminal M and ground the starter body.
3. Pull out the drive pinion with a screwdriver. Verify that it returns to its original position when released.
   - If does not return, repair or replace the starter.

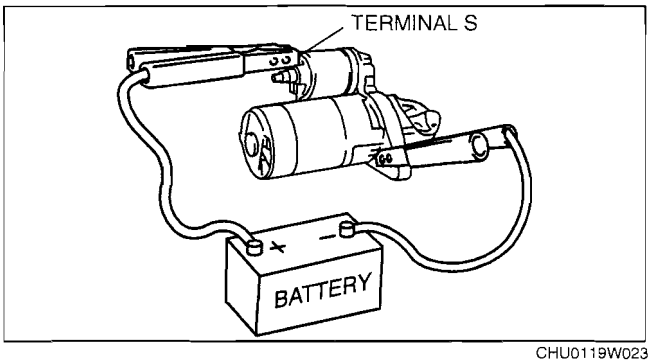


CHU0119W022

Pinion Gap Inspection

1. Pull out the drive pinion with battery positive voltage connected to terminal S and the starter body grounded.

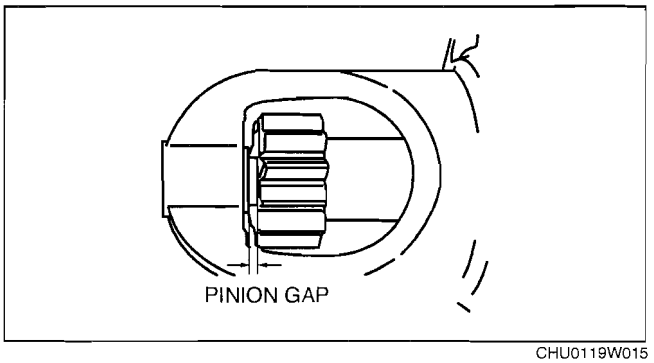
   Caution
   - **Applying power for more than 10 s can damage the starter. Do not apply power for more than 10 s.**



CHU0119W023

2. Measure the pinion gap while the drive pinion is extended.
   - If not as specified, adjust with an adjustment washer (between drive housing front cover and magnetic switch).

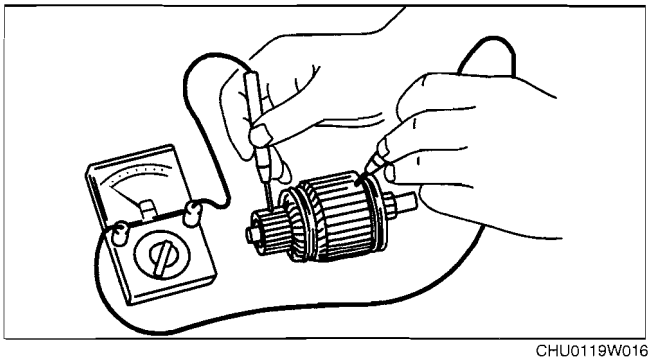
   Pinion gap
   0.5—2.0 mm {0.02—0.07 in}



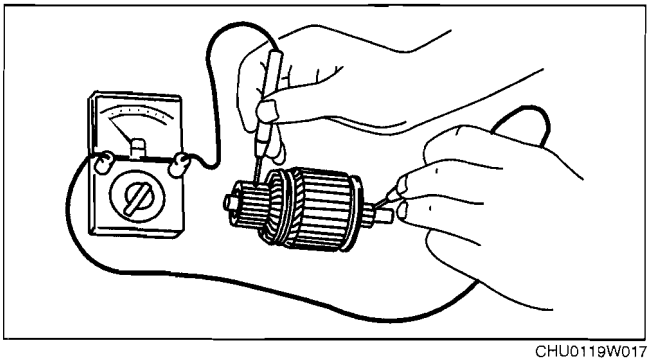
CHU0119W015

Starter Inner Parts Inspection
Armature

1. Verify that there is no continuity between the commutator and the core at each segment using a tester.
   - If there is continuity, replace the armature.

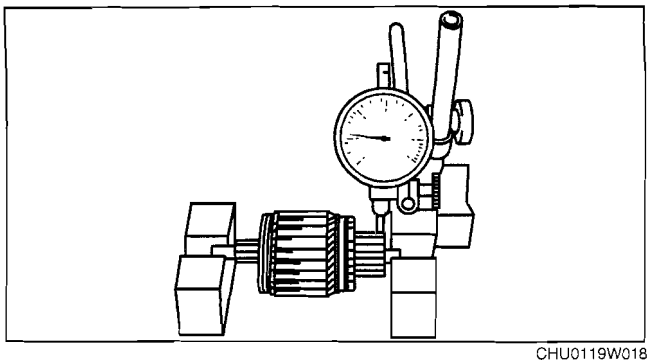

CHU0119W016

2. Verify that there is no continuity between the commutator and the shaft using a tester.
   - If there is continuity, replace the armature.


CHU0119W017

3. Place the armature on V-blocks, and measure the runout using a dial indicator.

Runout
0.05 mm {0.002 in} max.

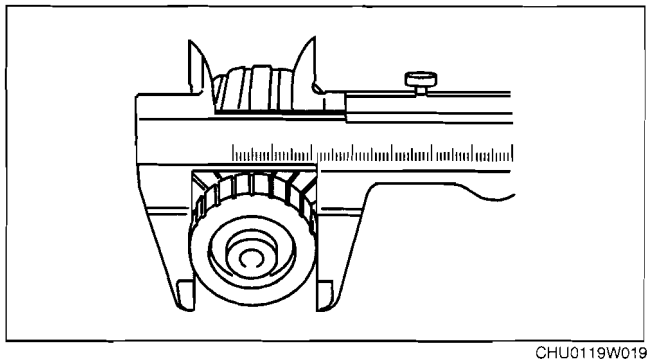


CHU0119W018

4. Measure the commutator diameter.
   - If not within the minimum specification, replace the armature.

Standard commutator diameter
29.4 mm {1.16 in}

Minimum commutator diameter
28.8 mm {1.13 in}

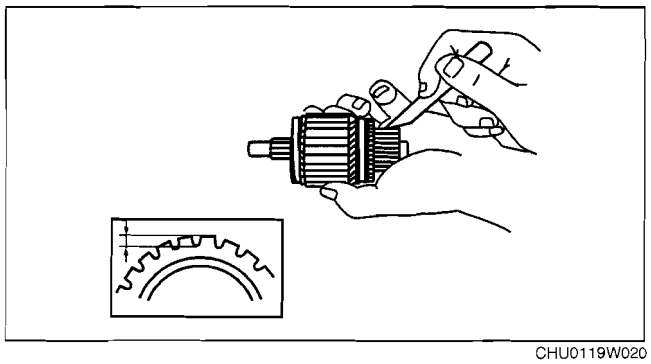


CHU0119W019

5. Measure the segment groove depth of commutator.
   - If not within the minimum specification, undercut the grooves to the standard depth.

Standard depth
0.4—0.6 mm {0.016—0.023 in}

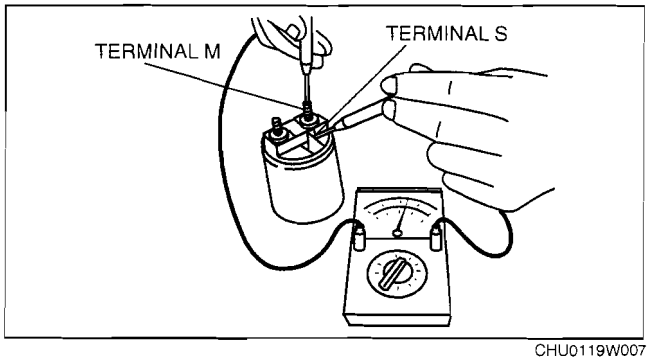
Minimum depth
0.2 mm {0.008 in}



CHU0119W020

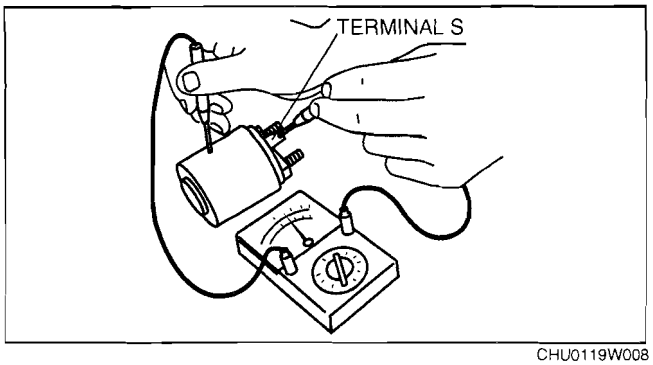
Magnetic switch

1. Inspect for continuity between terminals S and M using a tester.
   - If there is no continuity, replace the magnetic switch.
2. Inspect for continuity between terminal S and the body using a tester.
   - If there is no continuity, replace the magnetic switch.

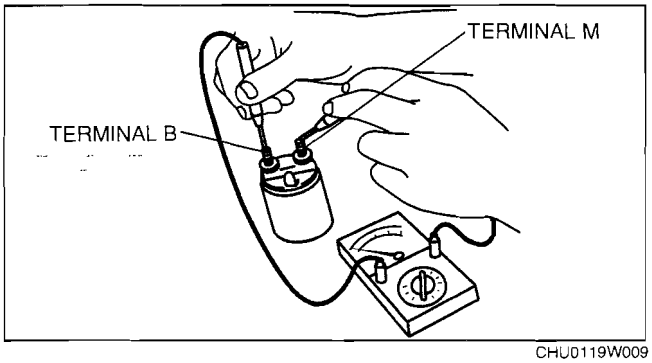


CHU0119W007

3. Verify that there is no continuity between terminals M and B using a tester.
   - If there is continuity, replace the magnetic switch.



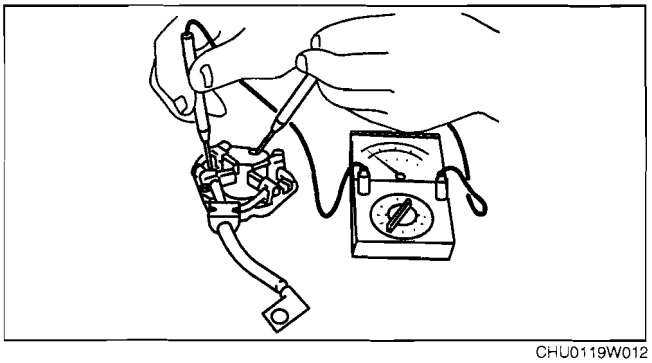
CHU0119W008



CHU0119W009

Brush and brush holder

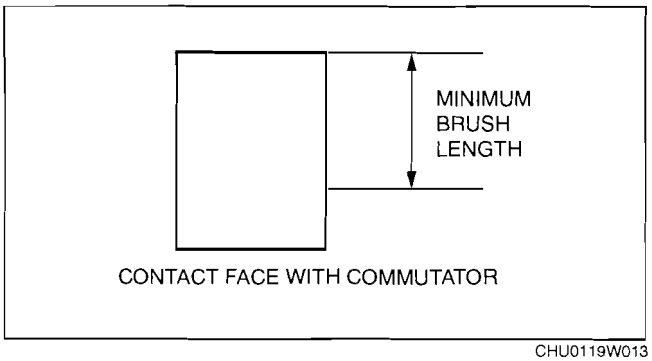
1. Verify that there is no continuity between each insulated brush and plate using a tester.
   - If there is continuity, replace the brush holder.


CHU0119W012

2. Measure the brush length.
   - If any brush is worn almost to or beyond the minimum specification, replace all of the brushes.

   Standard brush length
   12.3 mm {0.48 in}

   Minimum brush length
   7.0 mm {0.28 in}

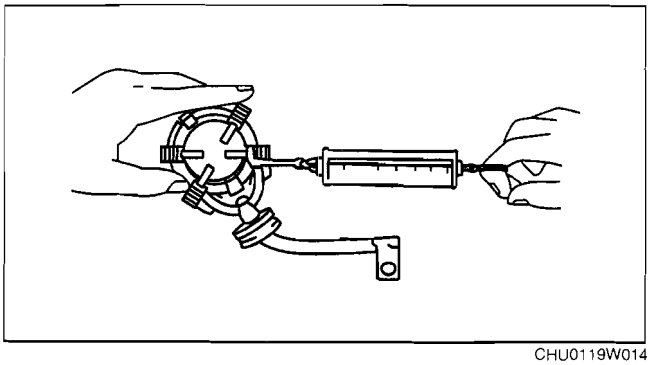


CHU0119W013

3. Measure the brush spring force using a spring balance.
   - If not within the minimum specification, replace the brush and brush holder component.

   Standard spring force
   18.3—24.9 N {1.87—2.53 kgf, 4.12—5.59 lbf}

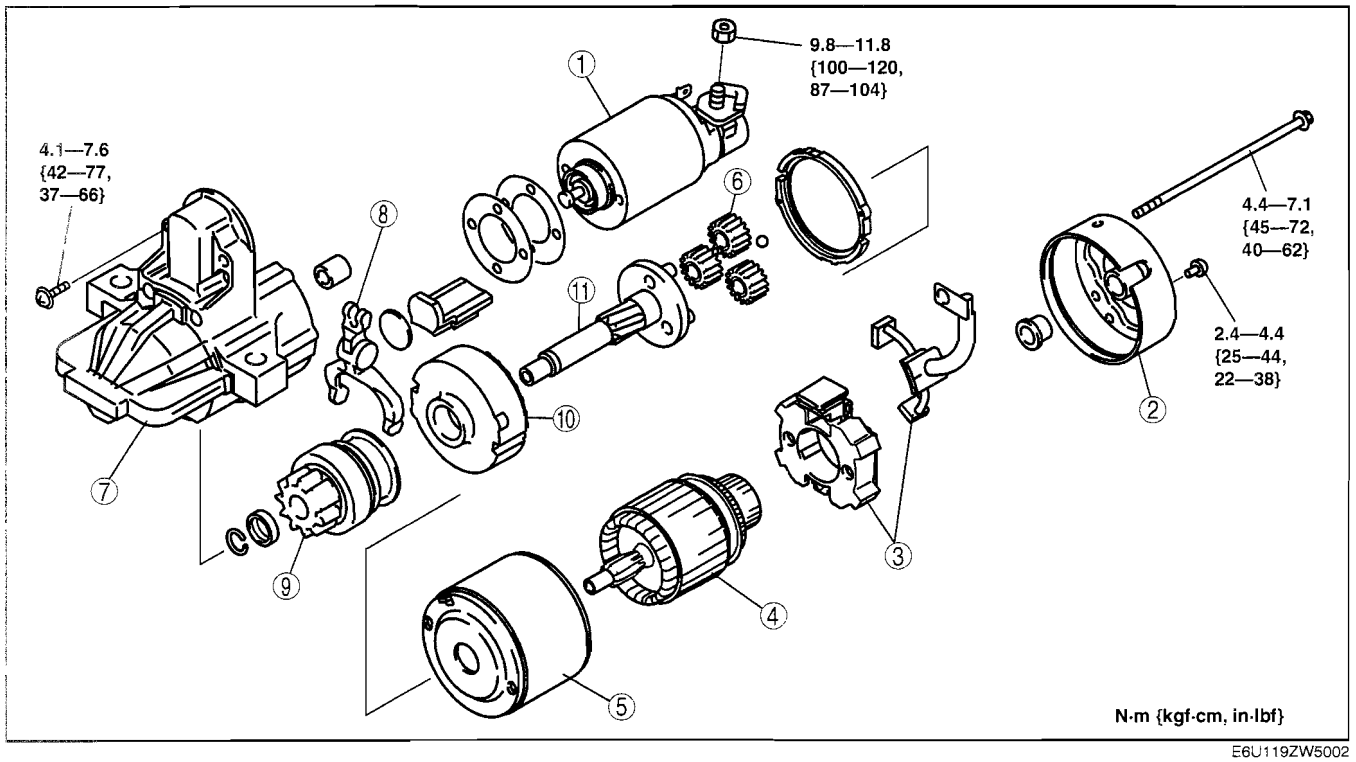
   Minimum spring force
   5.9 N {0.6 kgf, 1.3 lbf}


CHU0119W014

STARTER DISASSEMBLY/ASSEMBLY[LF, L3]

id0119a4800400

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



E6U119ZW5002

1	Magnetic switch
2	Rear housing
3	Brush and brush holder
4	Armature
5	Yoke
6	Planetary gear

7	Front cover
8	Lever
9	Drive pinion
10	Internal gear
11	Gear shaft

STARTER INTERLOCK SWITCH INSPECTION (MTX)[LF, L3]

id0119a4808900

Caution

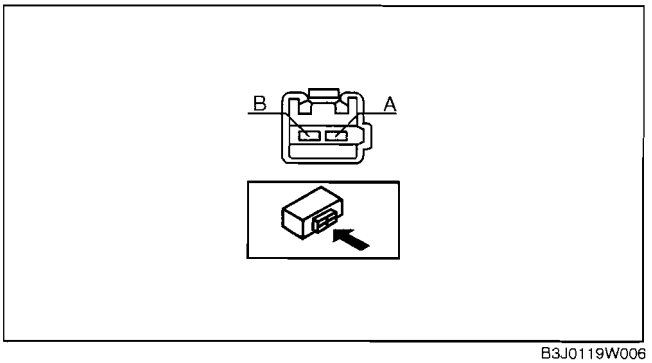
- **Do not reuse the starter interlock switch if it is removed from the vehicle even once. Replace with a new starter interlock switch when installing.**

1. Disconnect the negative battery cable.
2. Disconnect the starter interlock switch connector.
3. Verify that the continuity is as indicated in the table using a tester.
   - If the continuity is not as indicated in the table, replace the starter interlock switch.

O—O : Continuity

Condition	Terminal	
	A	B
Clutch pedal is depressed	O	O
Clutch pedal is not depressed		

epu119zw3002

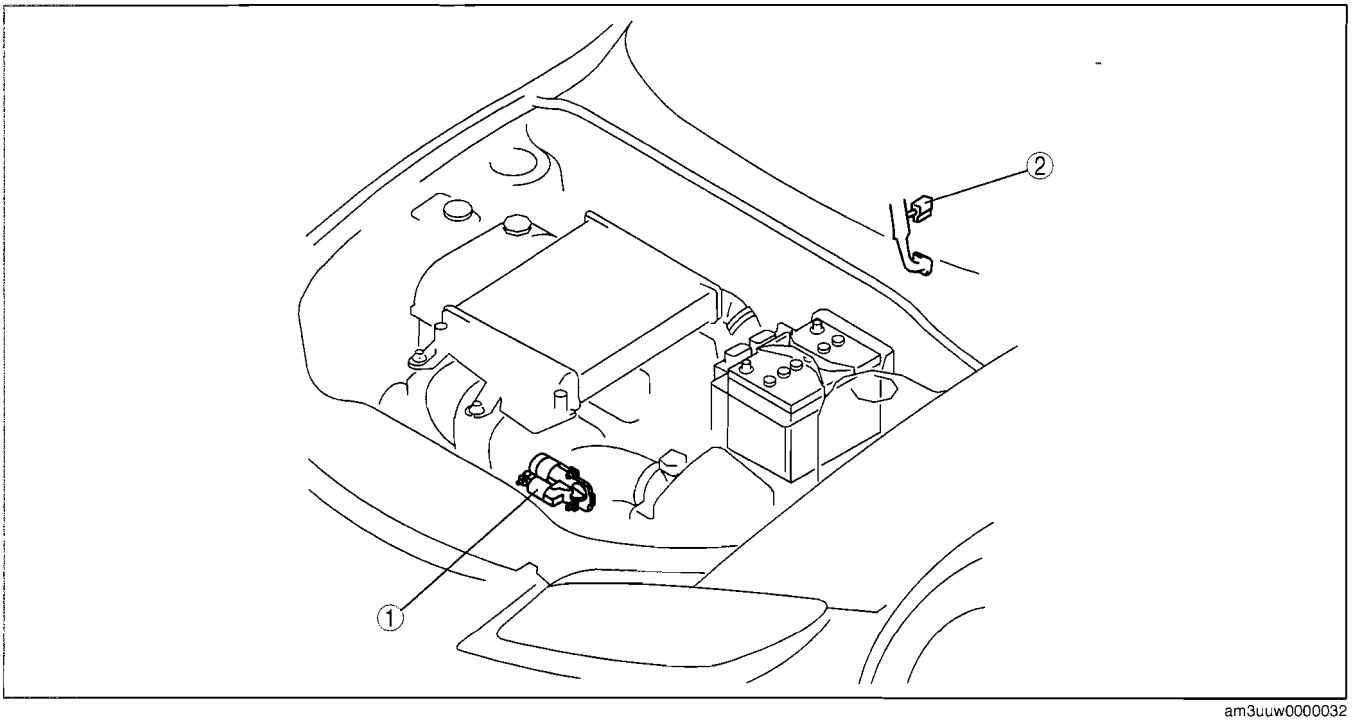


B3J0119W006

01-19B STARTING SYSTEM [L3 WITH TC]

STARTING SYSTEM LOCATION INDEX[L3 WITH TC]

id011939800100



am3uuw0000032

1	Starter (See 01-19B-2 STARTER REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-19B-3 STARTER INSPECTION[L3 WITH TC].) (See 01-19B-7 STARTER DISASSEMBLY/ ASSEMBLY[L3 WITH TC].)

2	Starter interlock switch (See 01-19B-8 STARTER INTERLOCK SWITCH INSPECTION[L3 WITH TC].)

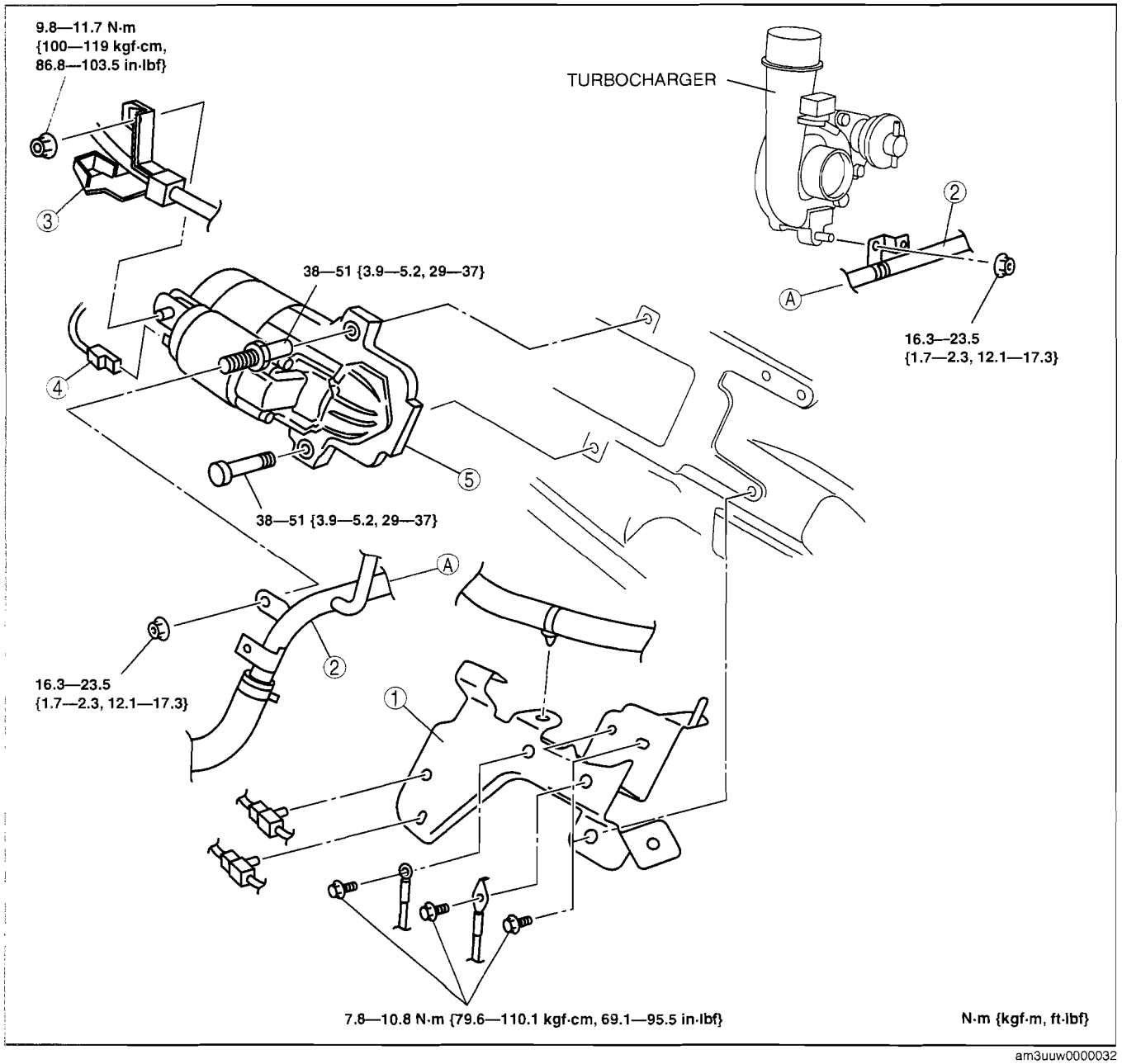
STARTER REMOVAL/INSTALLATION[L3 WITH TC]

id011939800200

Warning

- **Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.**
- **When the battery cables are connected, touching the vehicle body with starter terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the negative battery cable before performing the following operation.**

1. Remove the battery, battery tray and PCM component. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the air cleaner, charge air cooler cover, and air hose. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the under cover.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



am3uuw0000032

1	Wiring harness and wiring harness bracket
2	Heater pipe (See 01-19B-3 Heater Pipe Removal Note.)
3	Terminal B cable
4	Terminal S connector
5	Starter (See 01-19B-3 Starter Removal Note.)

Heater Pipe Removal Note

1. Remove the heater pipe with the water hoses still connected. Position the heater pipe so that it is out of the way.

Starter Removal Note

1. Remove the starter from below the engine compartment.

STARTER INSPECTION[L3 WITH TC]

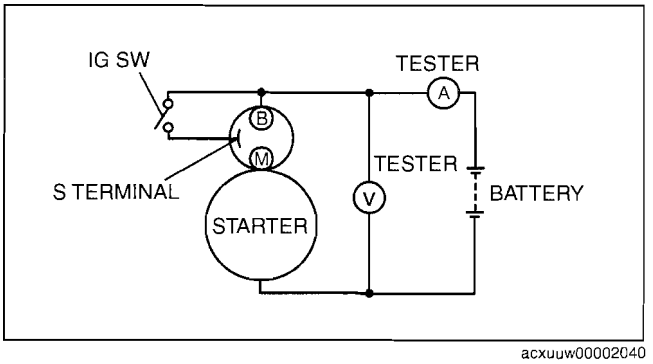
id011939800300

On-vehicle Inspection

1. Verify that the battery is fully charged.
2. The starter is normal if it rotates smoothly and without any noise when the engine is cranked.
   - If the starter does not operate, inspect the following:
     — Remove the starter, and inspect the starter unit.
     — Inspect the related wiring harnesses and the ignition switch.

No-load Test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, and a tester as shown in the figure.
3. Operate the starter and verify that it rotates smoothly.
   - If the starter does not rotate smoothly, inspect the starter unit.
4. Measure the voltage and current while the starter is operating.
   - If not within the specification, replace the starter.



acxuuw00002040

Starter no-load test voltage
11 V

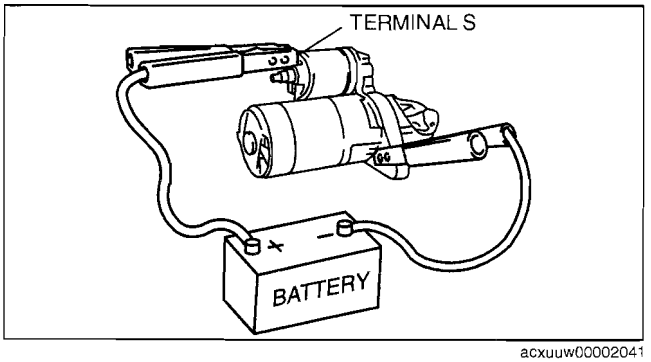
Starter no-load test current
90 A or less

Magnetic Switch Operation Inspection
Pull-out test

Note

- Depending on the battery charge condition, the starter motor pinion may rotate while in an extended state. This is due to current flowing to the starter motor through the pull-in coil to turn the starter motor, and does not indicate an abnormality.

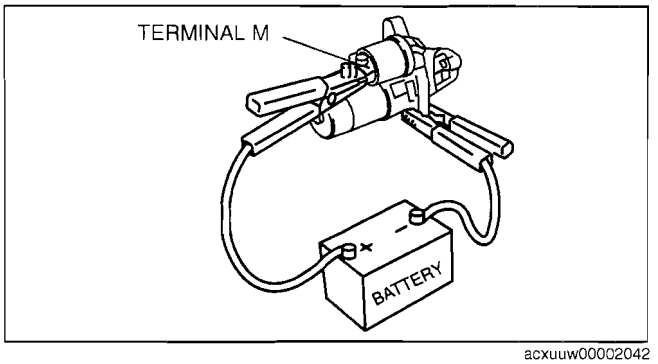
1. Verify that the starter motor pinion is extended while battery positive voltage is connected to terminal S and the starter body is grounded.
   - If the starter motor pinion is not extended, repair or replace the starter.



acxuuw00002041

Return test

1. Disconnect the motor wire from terminal M.
2. Connect battery positive voltage to terminal M and ground the starter body.
3. Pull out the drive pinion with a screwdriver. Verify that it returns to its original position when released.
   - If it does not return, repair or replace the starter.

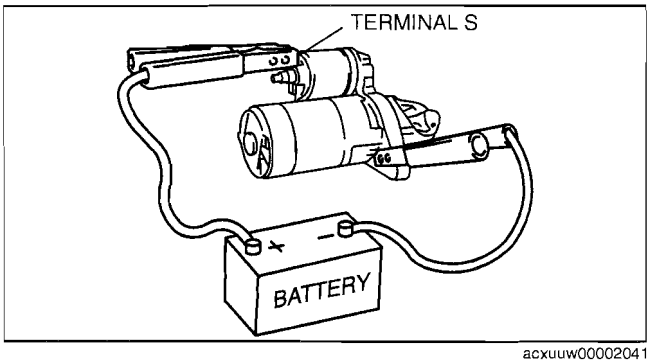


acxuuw00002042

Pinion Gap Inspection

1. Pull out the drive pinion with the battery positive voltage connected to terminal S and the starter body grounded.

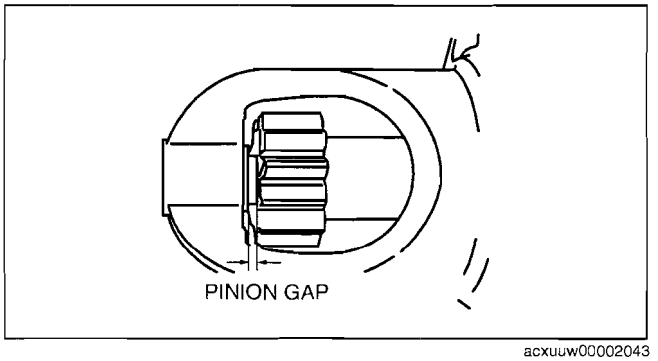
   Caution
   - **Applying power for more than 10 s can damage the starter. Do not apply power for more than 10 s.**



acxuuw00002041

2. Measure the pinion gap while the drive pinion is extended.
   - If not as specified, adjust with an adjustment washer (between drive housing front cover and magnetic switch).

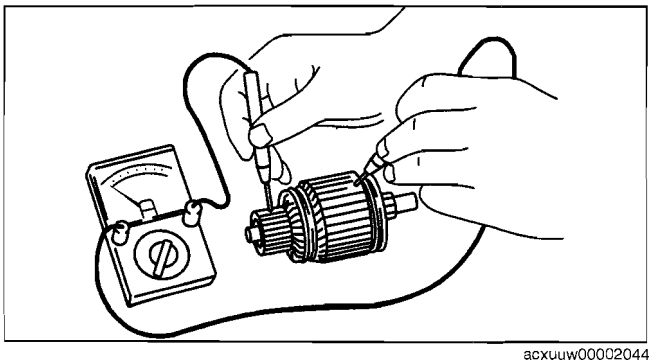
   Starter pinion gap
   0.5—2.0 mm {0.02—0.07 in}



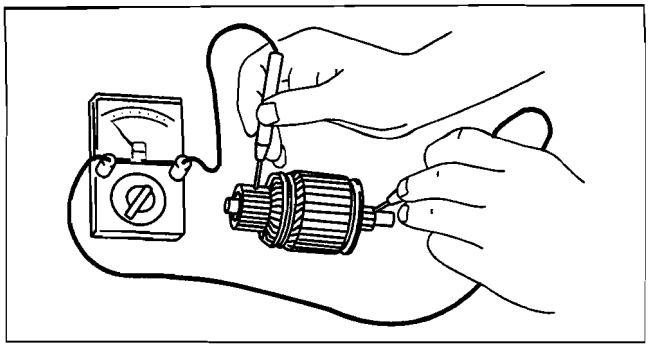
acxuuw00002043

Starter Inner Parts Inspection
Armature

1. Verify that there is no continuity between the commutator and the core at each segment using a tester.
   - If there is continuity, replace the armature.


acxuuw00002044

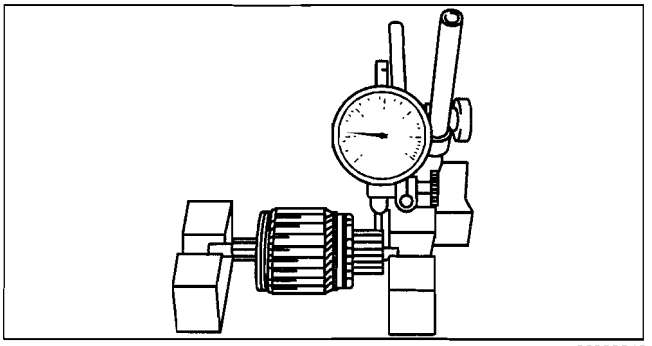
2. Verify that there is no continuity between the commutator and the shaft using a tester.
   - If there is continuity, replace the armature.



acxuuw00002045

3. Place the armature on V-blocks, and measure the runout using a dial indicator.

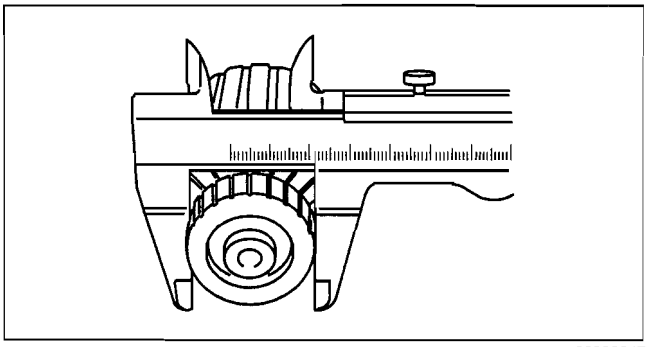
   Starter armature runout
   0.05 mm {0.002 in} max.



acxuuw00002046

4. Measure the commutator diameter.
   - If not within the minimum specification, replace the armature.

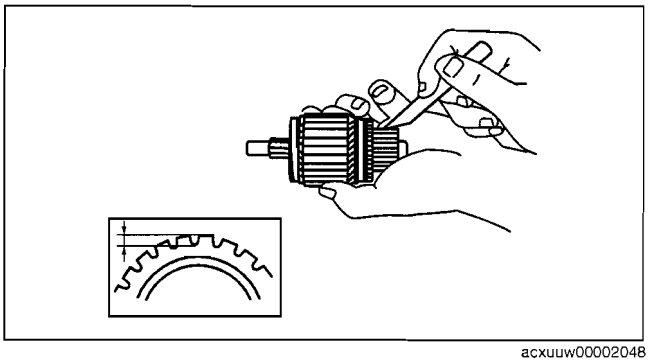
   Starter commutator diameter
   Standard: 29.4 mm {1.16 in}
   Minimum: 28.8 mm {1.13 in}



acxuuw00002047

5. Measure the segment groove depth of the commutator.
   - If not within the minimum specification, undercut the grooves to the standard depth.

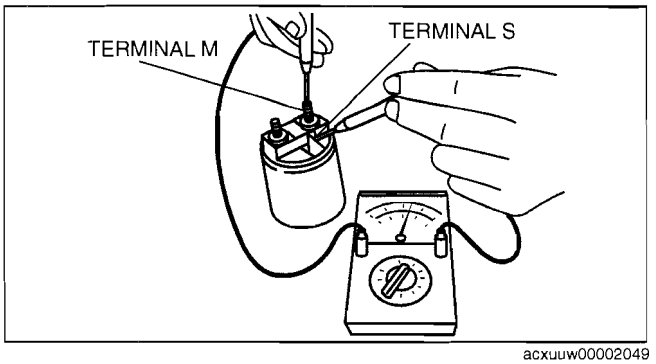
   Segment groove depth of starter commutator
   Standard: 0.4—0.6 mm {0.016—0.023 in}
   Minimum: 0.2 mm {0.008 in}



acxuuw00002048

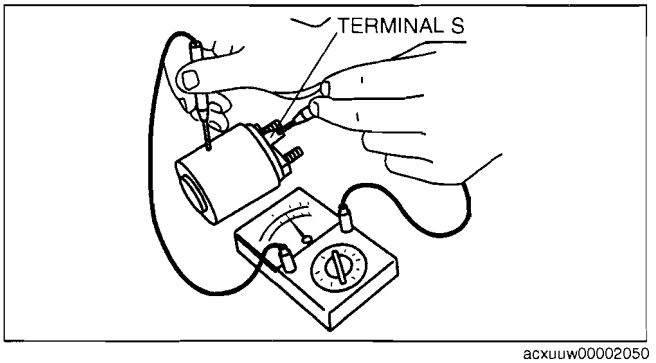
Magnetic switch

1. Inspect for continuity between terminals S and M using a tester.
   - If there is no continuity, replace the magnetic switch.



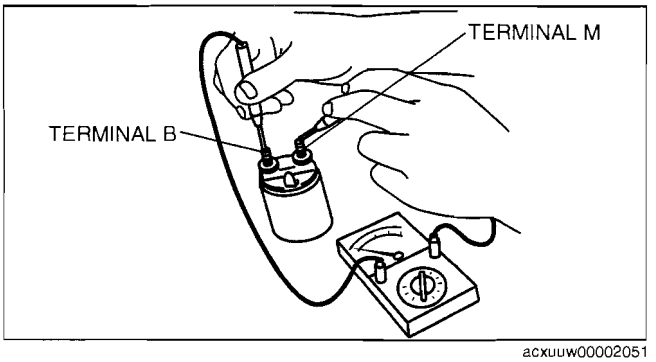
acxuuw00002049

2. Inspect for continuity between terminal S and the body using a tester.
   - If there is no continuity, replace the magnetic switch.



acxuuw00002050

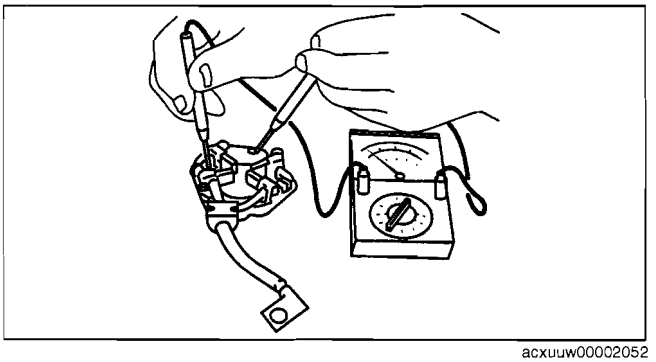
3. Verify that there is no continuity between terminals M and B using a tester.
   - If there is continuity, replace the magnetic switch.



acxuuw00002051

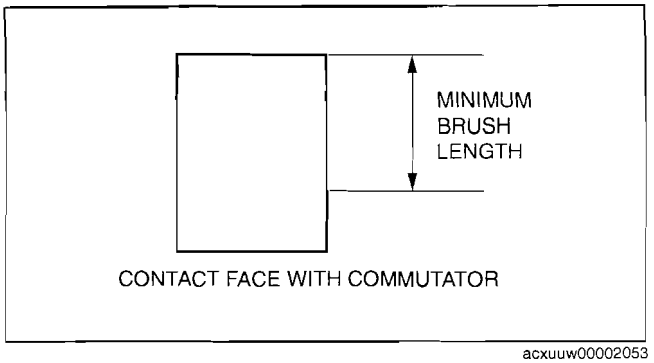
Brush and brush holder

1. Verify that there is no continuity between each insulated brush and plate using a tester.
   - If there is continuity, replace the brush holder.


acxuuw00002052

2. Measure the brush length.
   - If any brush is worn almost to or beyond the minimum specification, replace all of the brushes.

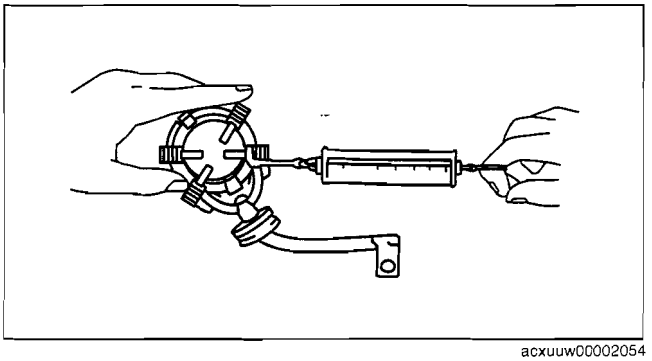
Starter brush length
Standard: 12.3 mm {0.48 in}
Minimum: 7.0 mm {0.28 in}



acxuuw00002053

3. Measure the brush spring force using a spring balance.
   - If not within the minimum specification, replace the brush and brush holder component.

Starter brush spring force
Standard: 18.3—24.9 N {1.87—2.53 kgf, 4.12—5.59 lbf}
Minimum: 5.9 N {0.6 kgf, 1.3 lbf}

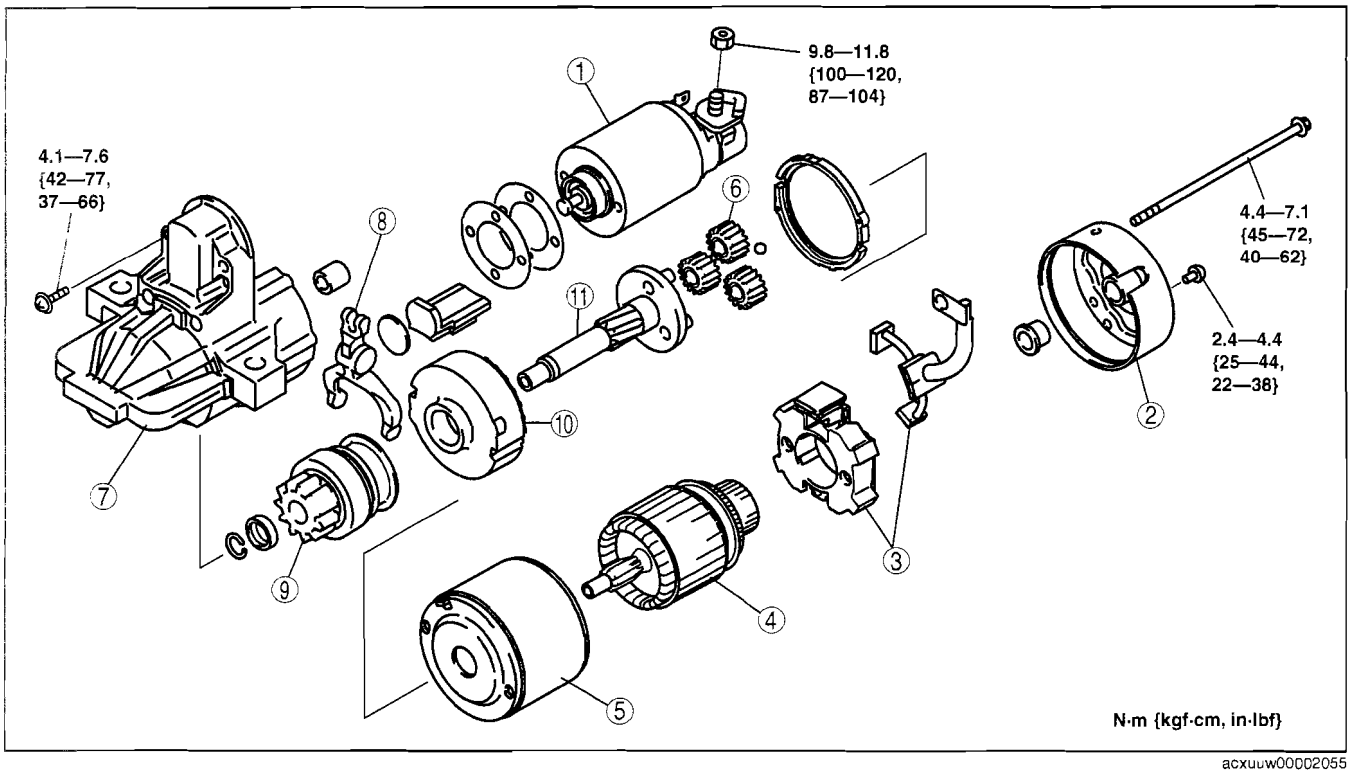


acxuuw00002054

STARTER DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id011939800400

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



acxuuw00002055

1	Magnetic switch
2	Rear housing
3	Brush and brush holder
4	Armature
5	Yoke
6	Planetary gear

7	Front cover
8	Lever
9	Drive pinion
10	Internal gear
11	Gear shaft

STARTER INTERLOCK SWITCH INSPECTION[L3 WITH TC]

id011939809000

Caution

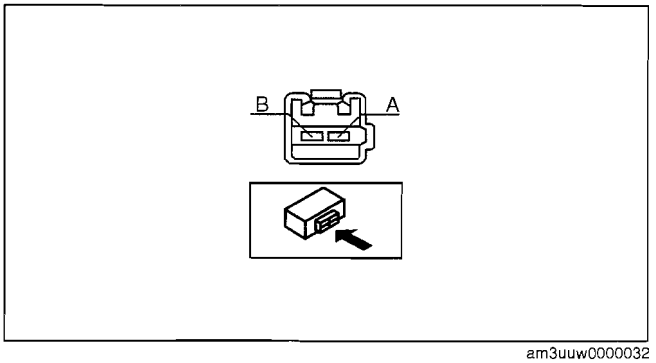
- **Do not reuse the starter interlock switch if it is removed from the vehicle even once. Replace with a new starter interlock switch when installing.**

1. Remove the battery cover. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the negative battery cable.
3. Disconnect the starter interlock switch connector.
4. Verify that the continuity is as indicated in the table using a tester.
   - If the continuity is not as indicated in the table, replace the starter interlock switch.

O—O : Continuity

Condition	Terminal	
	A	B
Clutch pedal is depressed	O	O
Clutch pedal is not depressed		

epu119zw3002



am3uuw0000032

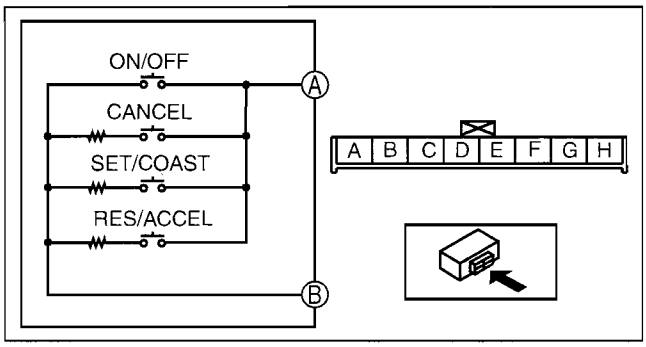
01-20A CRUISE CONTROL SYSTEM [LF, L3]

CRUISE CONTROL SWITCH INSPECTION[LF, L3]

id0120a3800100

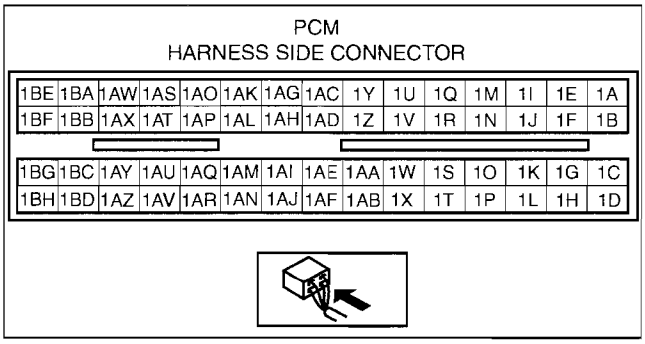
1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4. Disconnect the audio control switch connector.
5. Inspect for resistance and continuity between cruise control switch terminals A—B using a tester.
   - If not as specified, replace the cruise control switch. (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.)

Switch condition	Resistance (ohm)
ON/OFF button pressed	Continuity
CANCEL button pressed	118—122
SET/COAST button pressed	667—693
RES/ACCEL button pressed	2,156—2,244
No button pressed	No continuity



e3u120zw6001

Circuit Open/Short Inspection



e3u120zw6002

1. Disconnect the PCM connector.
2. Disconnect the cruise control switch connector. (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.)
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - — Cruise control switch terminal A and PCM terminal 1AQ*1, 1AD*2
  - — Cruise control switch terminal B and body ground

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - — Cruise control switch terminal A and body ground
  - — Cruise control switch terminal B and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

*2 . Except for California emission regulation applicable model with LF ATX

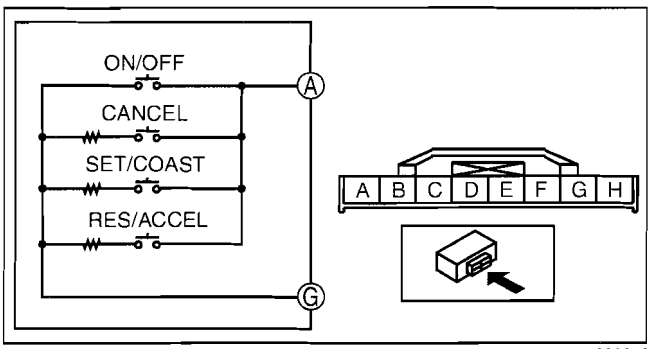
01-20B CRUISE CONTROL SYSTEM [L3 WITH TC]

CRUISE CONTROL SWITCH INSPECTION[L3 WITH TC]

id012039800100

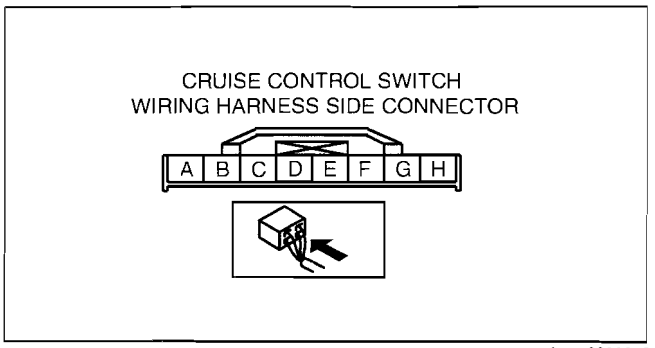
1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4. Disconnect the audio control switch connector.
5. Inspect for resistance and continuity between cruise control switch terminals A—G using a tester.
   - If not as specified, replace the cruise control switch. (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.)

Switch condition	Resistance (ohm)
ON/OFF button pressed	Continuity
CANCEL button pressed	118—122
SET/COAST button pressed	667—693
RES/ACCEL button pressed	2,156—2,244
No button pressed	No continuity

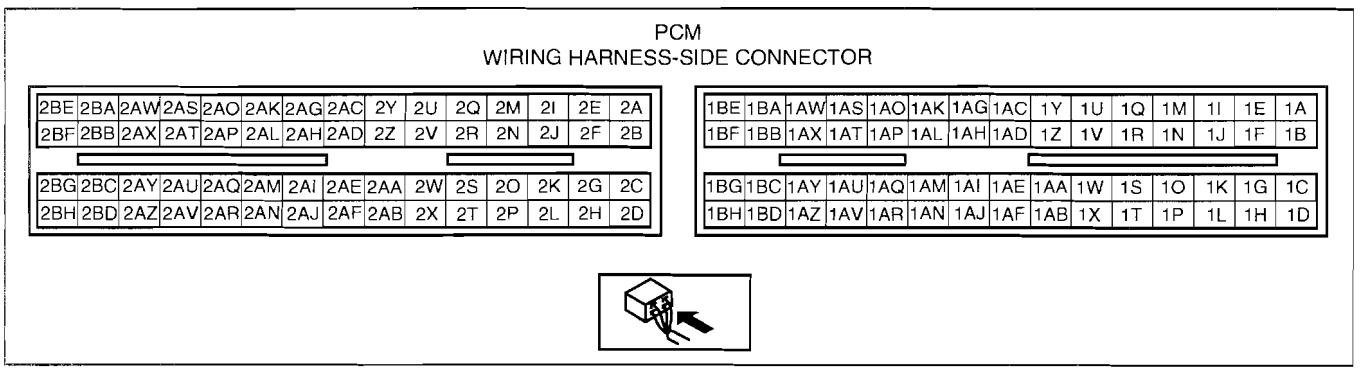


am3uuw0000036

Circuit Open/Short Inspection



am3uuw0000036



am3uuw0000036

1. Disconnect the PCM connector.
2. Disconnect the cruise control switch connector. (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.)
3. inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - Cruise control switch terminal A and PCM terminal 1AQ
  - Cruise control switch terminal G and body ground

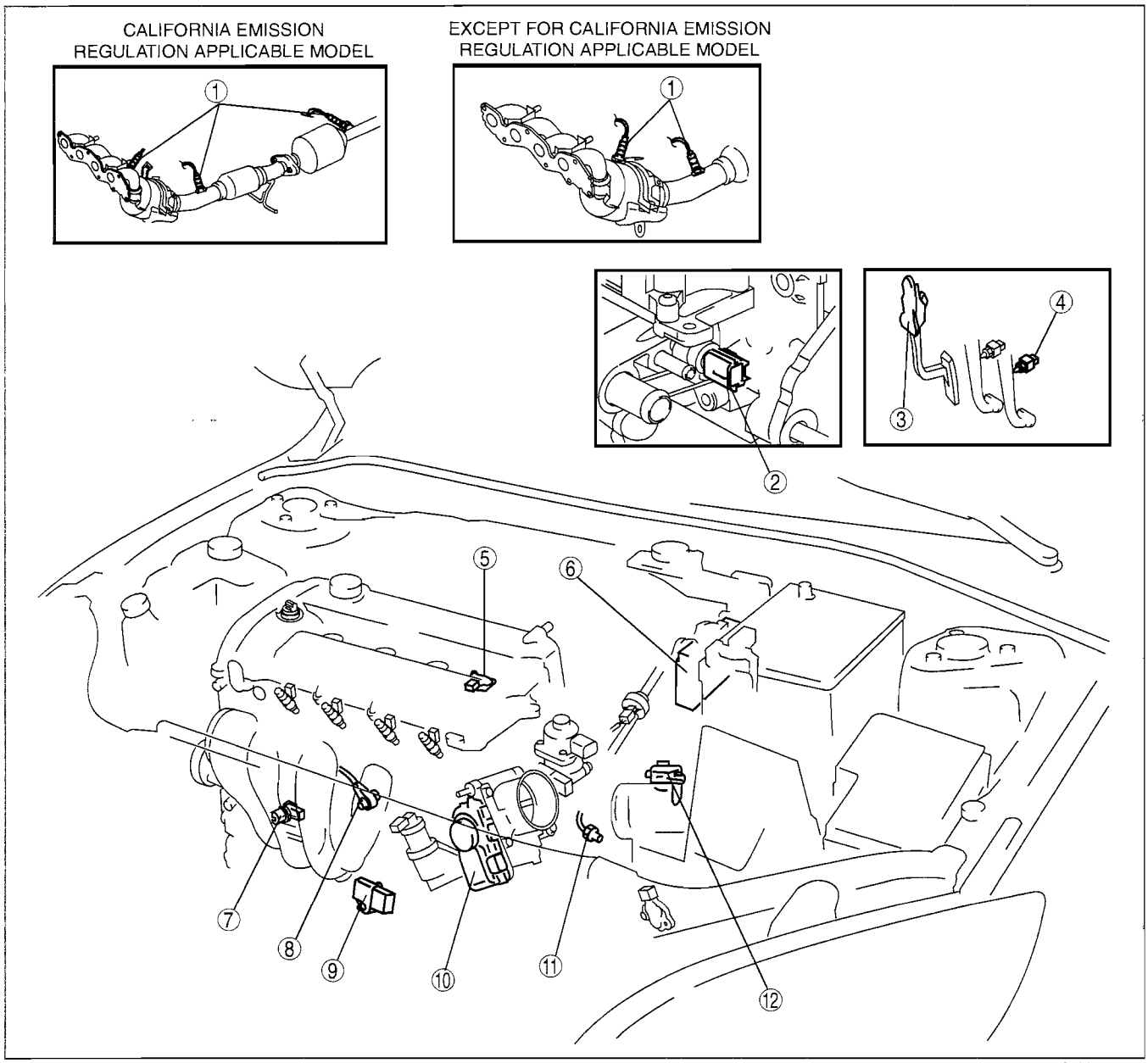
Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Cruise control switch terminal A and body ground
  - Cruise control switch terminal G and power supply

01-40A CONTROL SYSTEM [LF, L3]

CONTROL SYSTEM LOCATION INDEX[LF, L3]

id0140a6804100



e3u140zw6201

1	HO2S (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3].) (See 01-40A-57 HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3].)
2	ECT sensor (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/ INSTALLATION[LF, L3].) (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3].)
3	APP sensor (See 01-40A-56 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3].)
4	CPP switch (MTX) (See 01-40A-47 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3].)

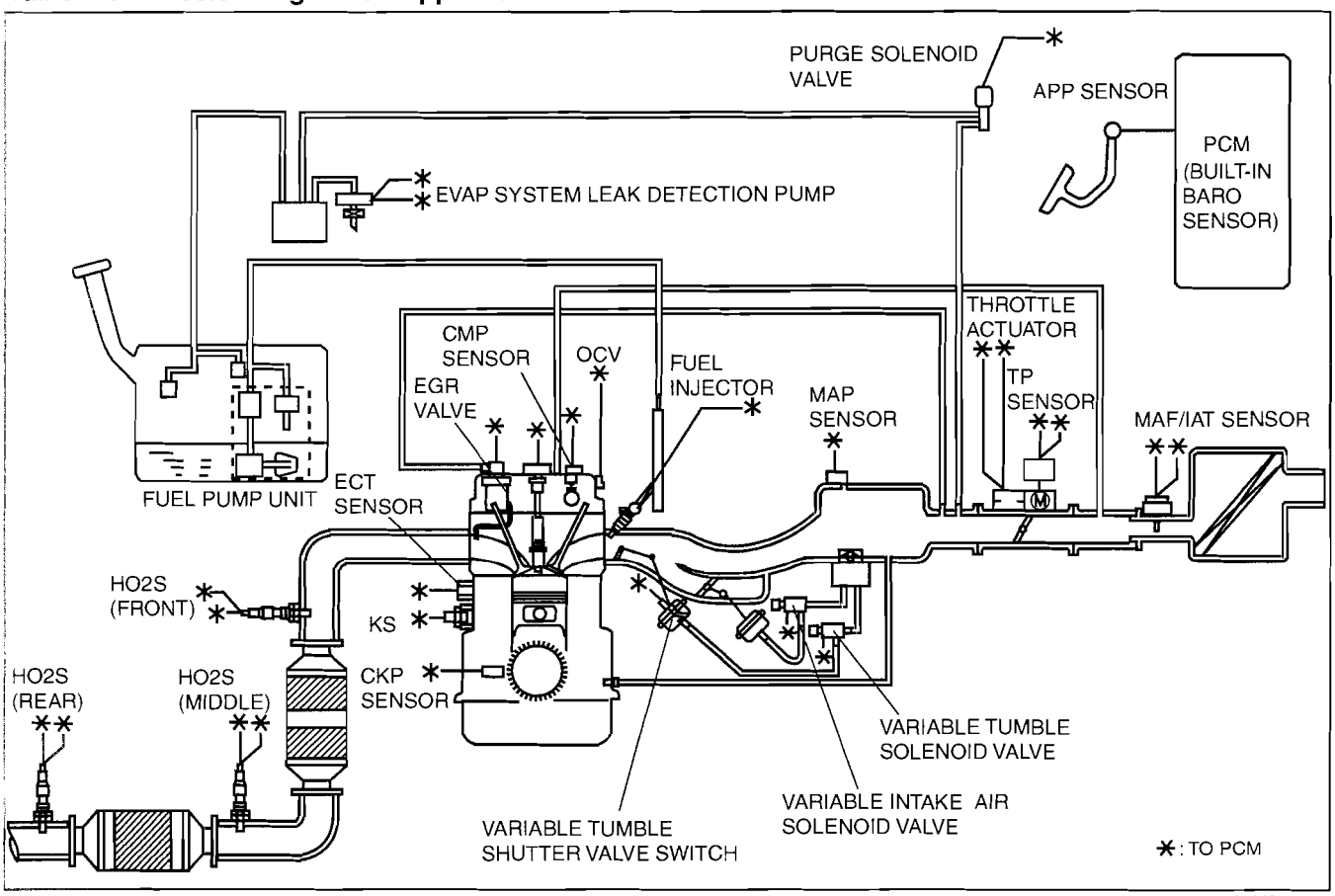
5	CMP sensor (See 01-40A-69 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION[LF, L3].) (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].)
6	PCM (built-in BARO sensor) (See 01-40A-13 PCM REMOVAL/ INSTALLATION[LF, L3].) (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 01-40A-45 PCM CONFIGURATION[LF, L3].) (See 01-40A-72 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[LF, L3].)
7	CKP sensor (See 01-40A-67 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3].) (See 01-40A-68 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3].)

8	KS (See 01-40A-71 KNOCK SENSOR (KS) REMOVAL/ INSTALLATION[LF, L3].) (See 01-40A-72 KNOCK SENSOR (KS) INSPECTION[LF, L3].)
9	MAP sensor (See 01-40A-53 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[LF, L3].)
10	TP sensor (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].)
11	Neutral switch (MTX) (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].)
12	MAF/IAT sensor (See 01-40A-50 MASS AIR FLOW (MAF) SENSOR INSPECTION[LF, L3].) (See 01-40A-52 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[LF, L3].)

CONTROL SYSTEM DIAGRAM[LF, L3]

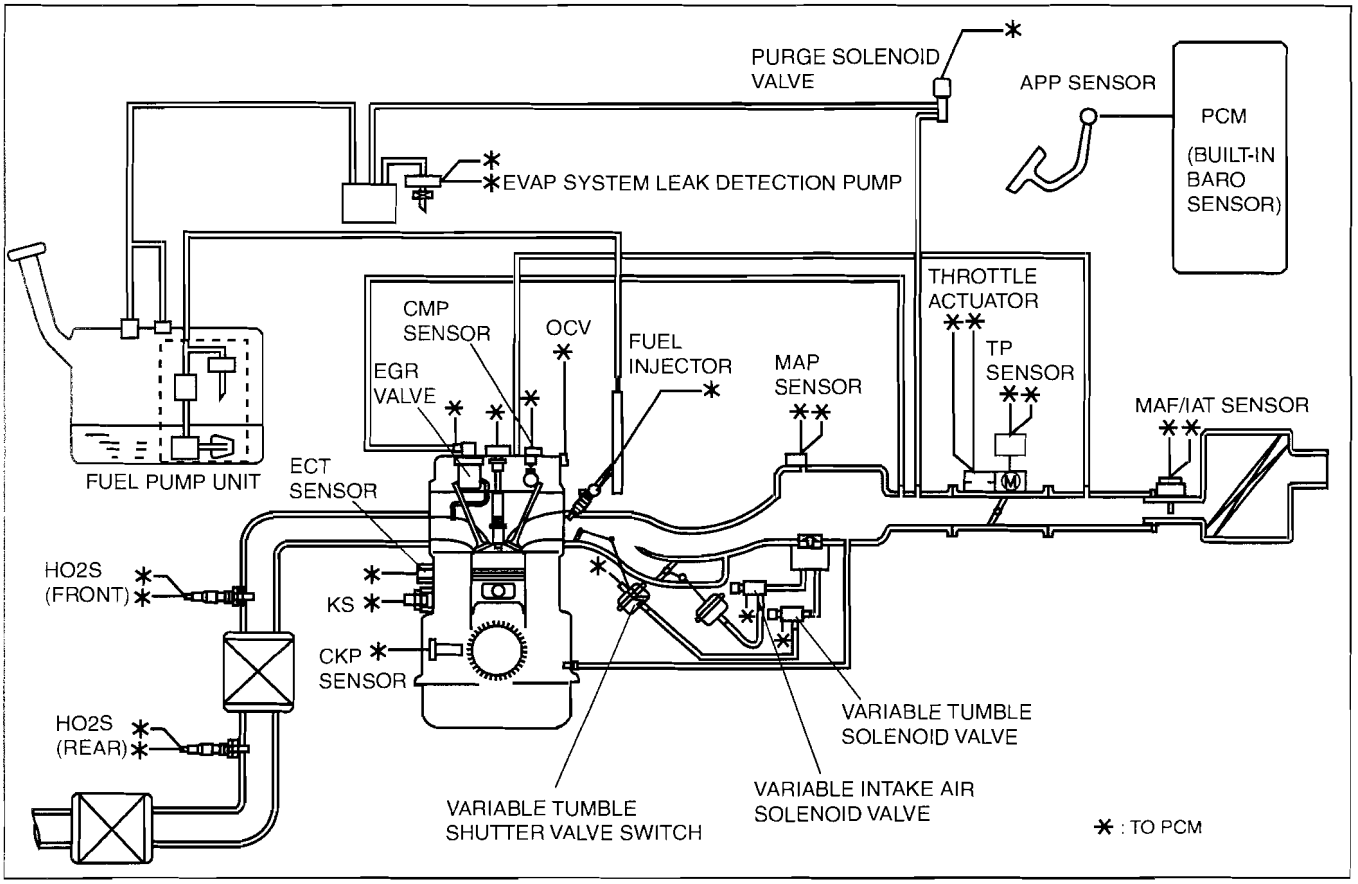
id0140a6800300

California Emission Regulation Applicable Model



e3u140zw6202

Except for California Emission Regulation Applicable Model

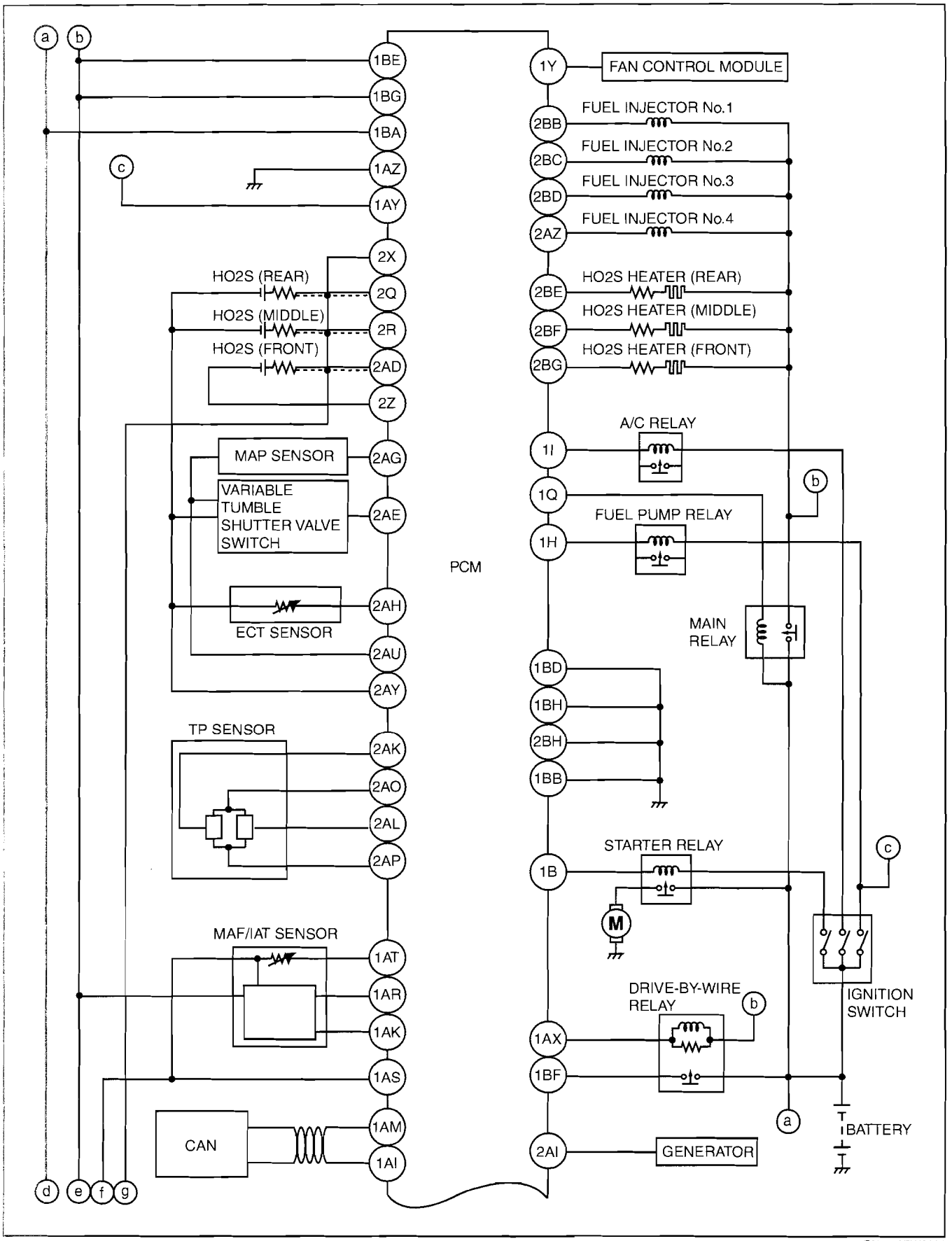


e3u140zw6203

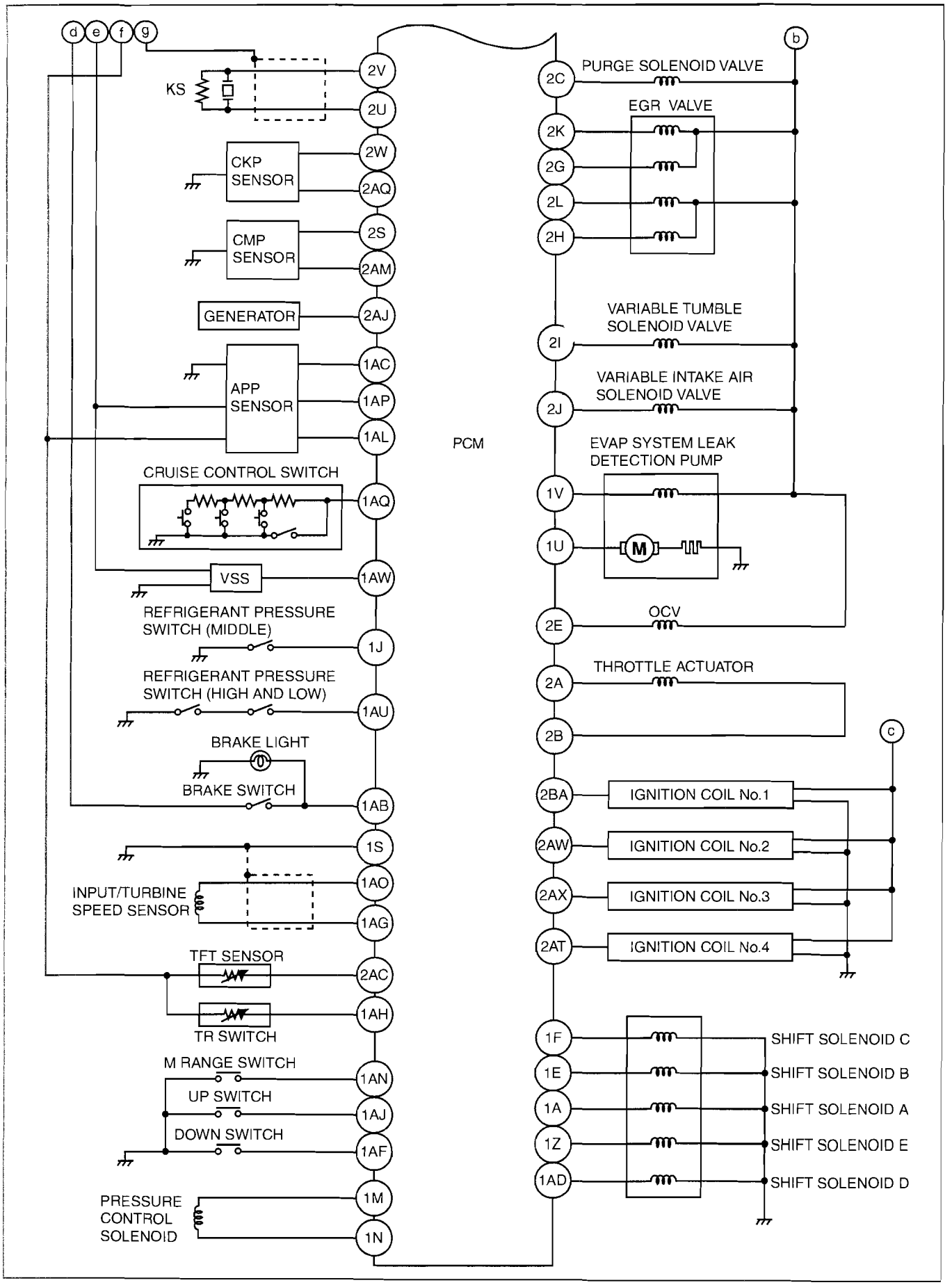
CONTROL SYSTEM WIRING DIAGRAM[LF, L3]

id0140a6800400

California Emission Regulation Applicable Model with LF ATX

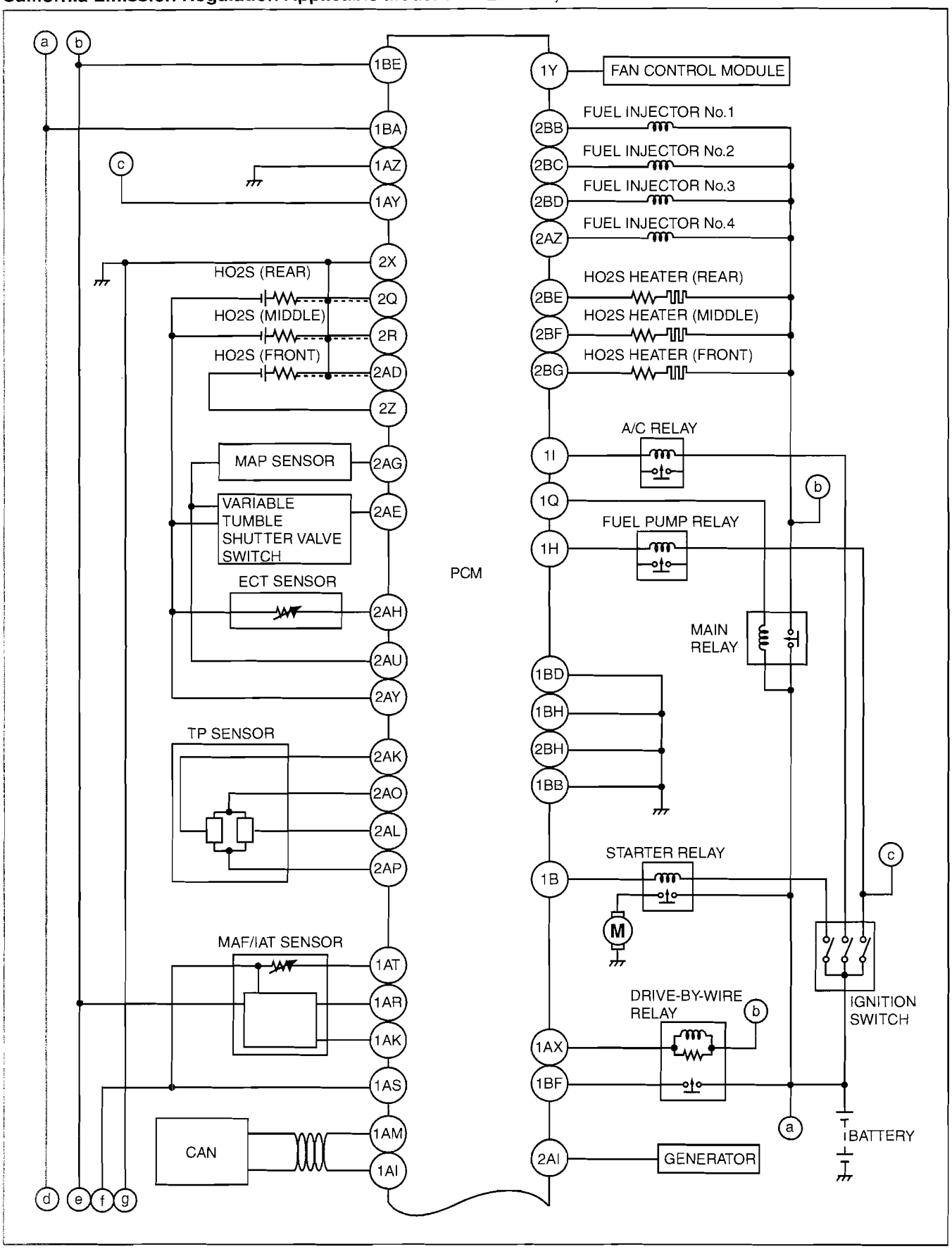


E3U140ZW6001

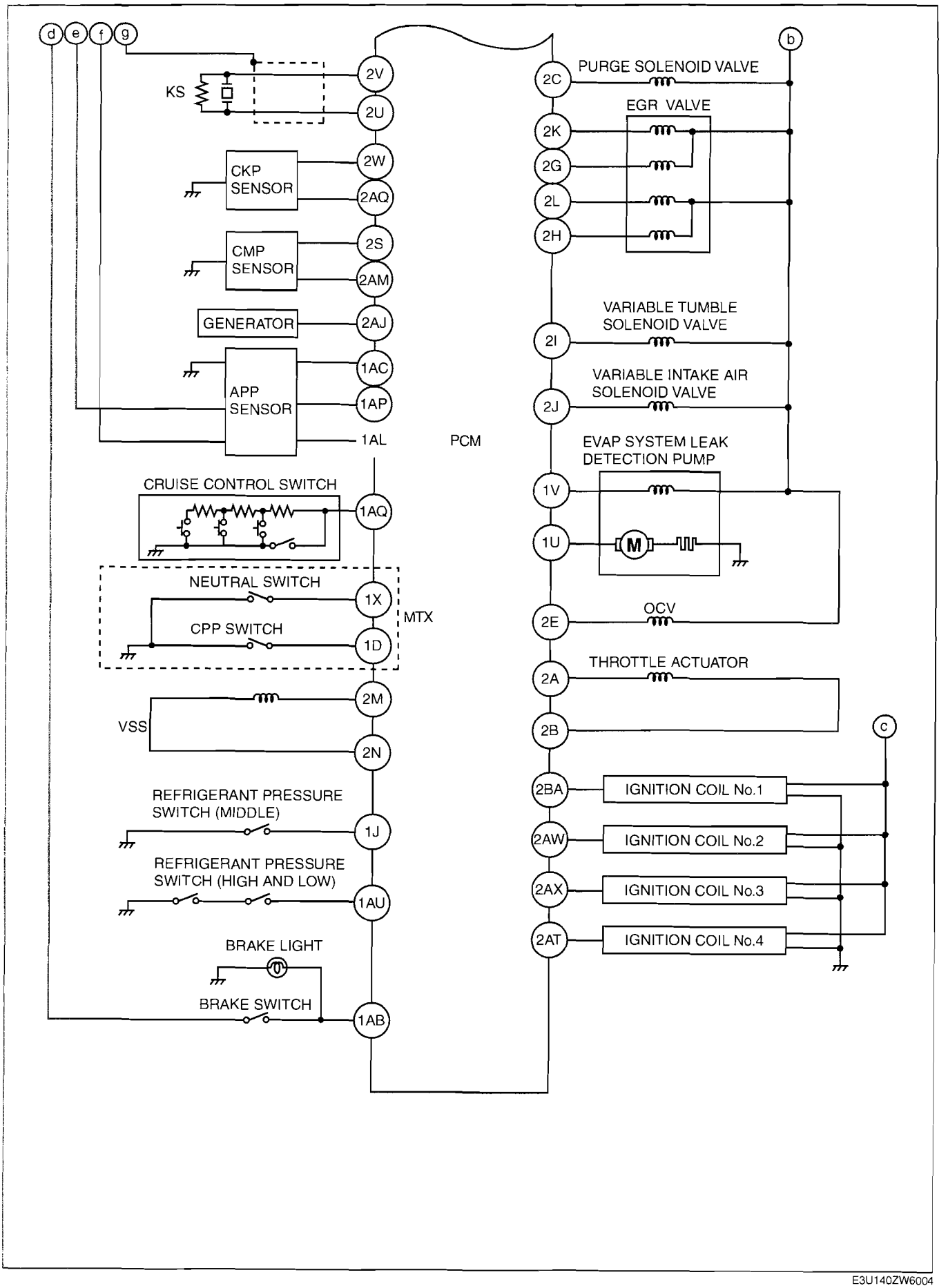


E3U140ZW6002

California Emission Regulation Applicable Model with LF MTX, L3

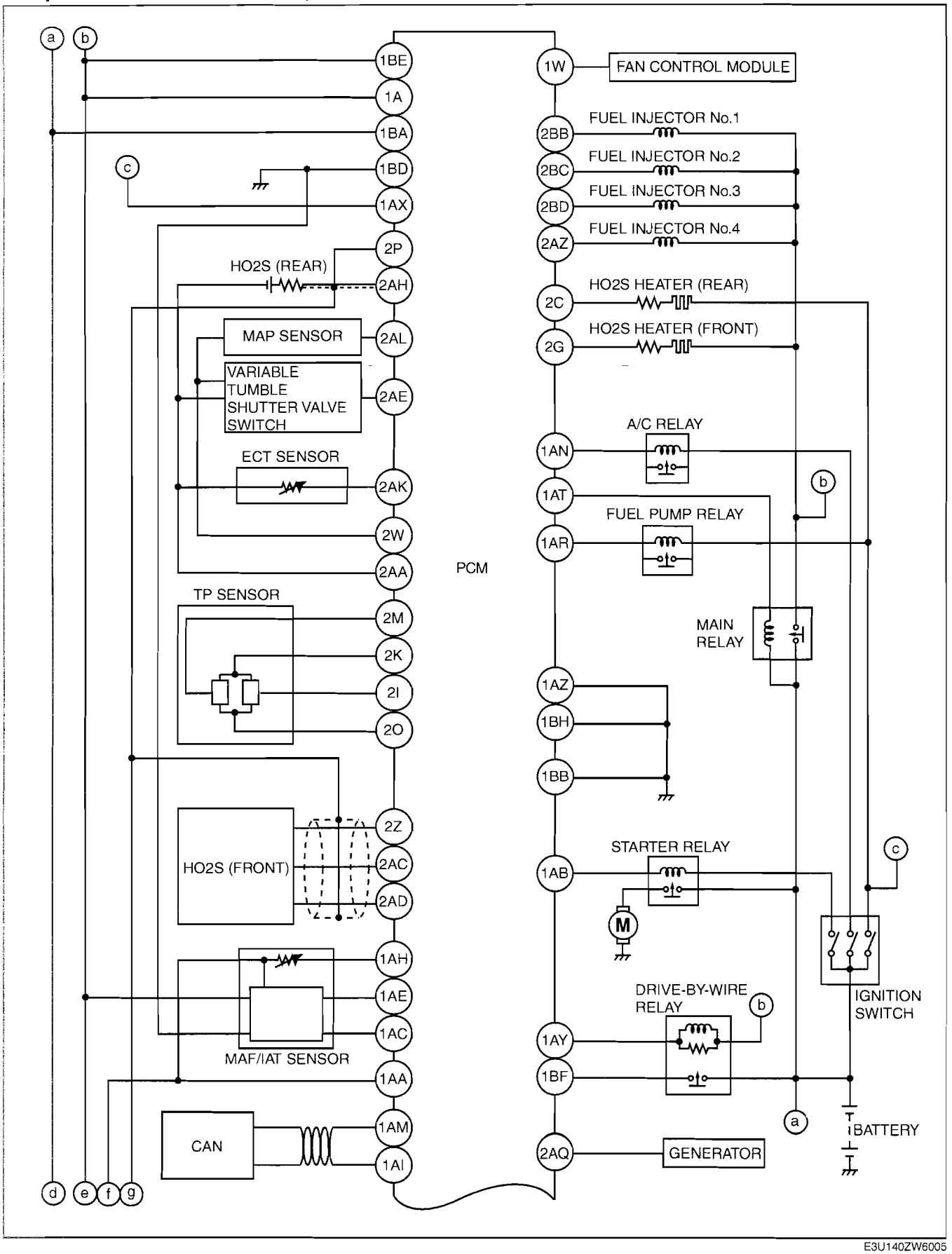


E3U140ZW6003

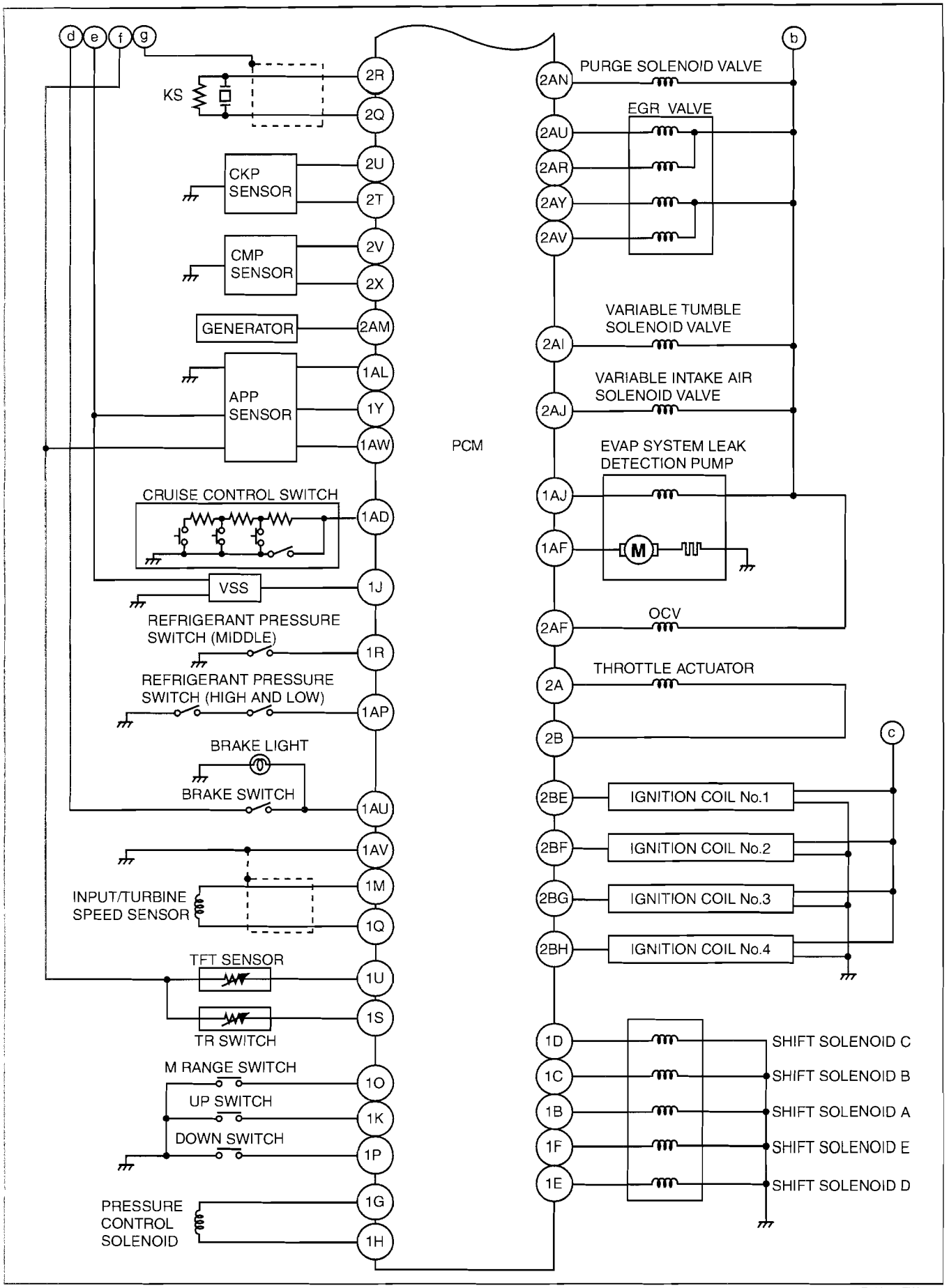


E3U140ZW6004

Except for California Emission Regulation Applicable Model with LF ATX

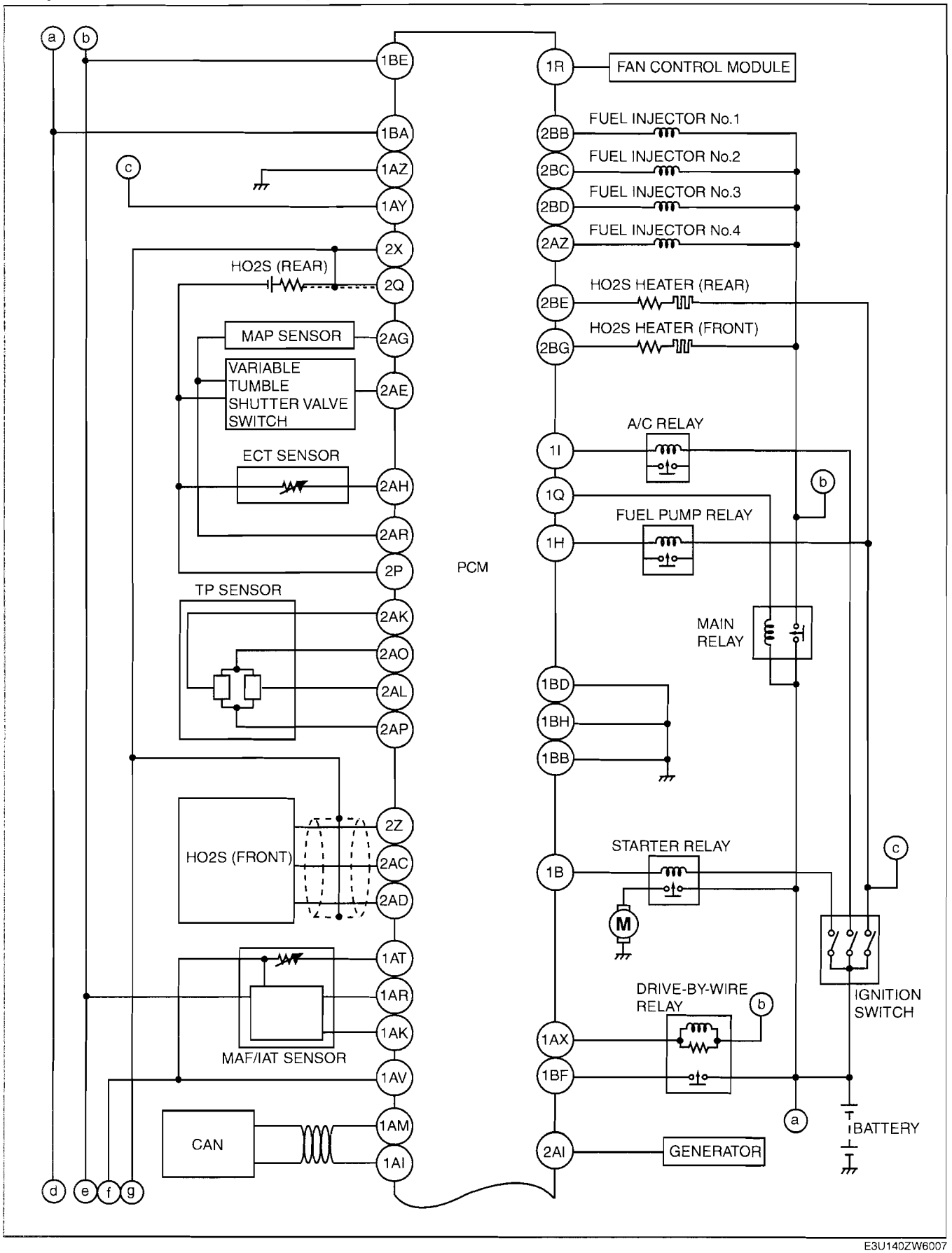


E3U140ZW6005

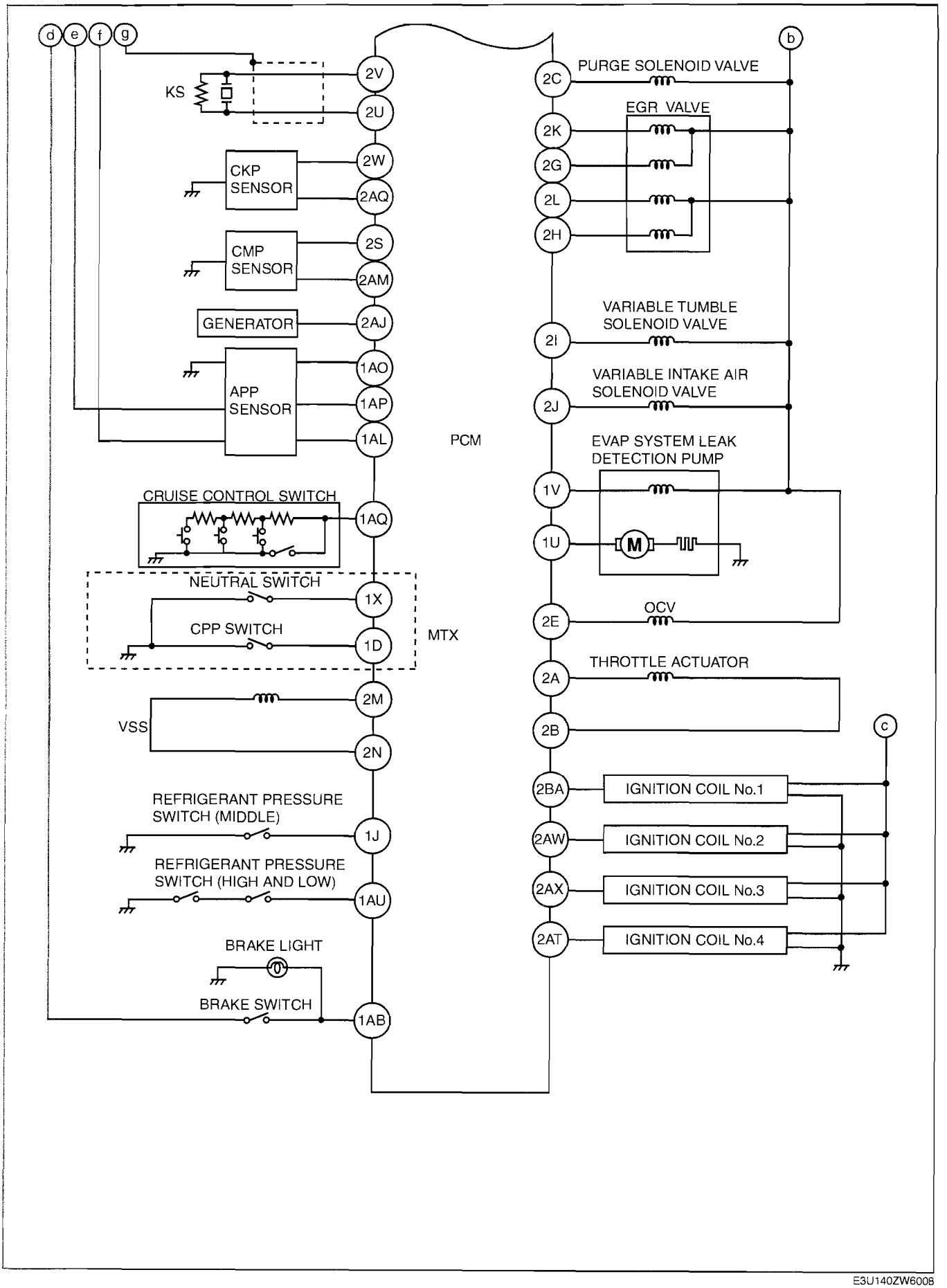


E3U140ZW6006

Except for California Emission Regulation Applicable Model with LF MTX, L3



E3U140ZW6007

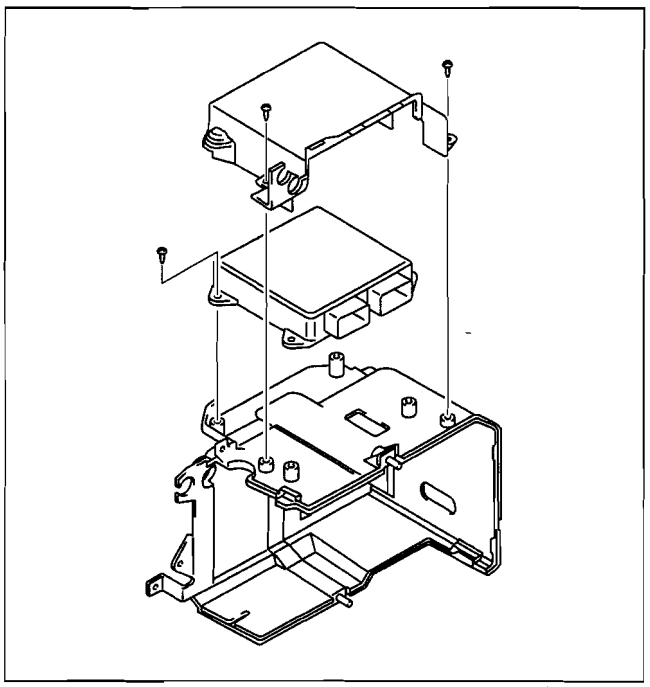


E3U140ZW6008

PCM REMOVAL/INSTALLATION[LF, L3]

id0140a6802400

1. When replacing the PCM, perform the following:
   - PCM configuration (See 01-40A-45 PCM CONFIGURATION[LF, L3].)
2. Remove the battery cover, battery duct, battery and battery tray with PCM. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the PCM connector.
4. Remove the PCM from the battery tray.
5. When replacing the PCM on the vehicles, perform the following:
   - PCM parameter reset (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
6. Install in the reverse order of removal.



b3e0140w000

PCM INSPECTION[LF, L3]

id0140a6802500

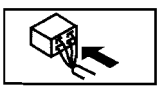
Without Using the SST
California emission regulation applicable model

Note
- The PCM terminal voltage can vary with the conditions when measuring and changes due to aged deterioration on the vehicle, causing false diagnosis. Therefore determine comprehensively where the malfunction occurs among the input systems, output systems, and the PCM.

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



am3uuw0000054

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1A	Shift solenoid A*1	Shift solenoid A	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Shift solenoid A • Related wiring harness
	—*2	—	—	—	—
1B	Starter relay control	Starter relay	Under any condition	Below 1.0	• Starter relay • Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1C	—	—	—		—	—
1D	—*1	—	—		—	—
	Clutch operation*2	CPP switch	Clutch pedal depressed		Below 1.0	• CPP switch • Related wiring harness
			Clutch pedal released		B+	
1E	Shift solenoid B*1	Shift solenoid B	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid B • Related wiring harness
	—*2	—	—		—	—
1F	Shift solenoid C*1	Shift solenoid C	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid C • Related wiring harness
	—*2	—	—		—	—
1G	—	—	—		—	—
1H	Fuel pump control	Fuel pump relay	Ignition switch to the ON position		B+	• Fuel pump relay • Related wiring harness
			Cranking		Below 1.0	
			Idle		Below 1.0	
1I	A/C	A/C relay	Idle	A/C operating	Below 1.0	• A/C relay • Related wiring harness
				A/C not operating	B+	
1J	Refrigerant pressure switch (medium)	Refrigerant pressure switch (medium)	A/C ON	Refrigerant pressure is above 1.52 MPa {15.5 kgf/cm^2, 220 psi}	Below 1.0	• Refrigerant pressure switch • Related wiring harness
				Refrigerant pressure is below 1.23 MPa {12.5 kgf/cm^2, 178 psi}	B+	
1K	—	—	—		—	—
1L	—	—	—		—	—
1M	Pressure control solenoid (+)*1	Pressure control solenoid	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Pressure control solenoid • Related wiring harness
	—*2	—	—		—	—
1N	Pressure control solenoid (–)*1	Pressure control solenoid	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Pressure control solenoid • Related wiring harness
	—*2	—	—		—	—
1O	—	—	—		—	—
1P	—	—	—		—	—
1Q	Main relay control	Main relay	Ignition switch off after 15 min		B+	• Main relay • Related wiring harness
			Ignition switch to the ON position		Below 1.0	
1R	—	—	—		—	—
1S	GND (shield)	Input/turbine speed sensor harness, GND	Under any condition		Below 1.0	• Related wiring harness
1T	—	—	—		—	—
1U	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1V	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
1W	—	—	—		—	—
1X	—*1	—	—		—	—
	Neutral position*2	Neutral switch	Ignition switch is turned to the ON position	Shift lever is at neutral position	Below 1.0	• Neutral switch • Related wiring harness
				Shift lever is not at neutral position	B+	
1Y	Cooling fan control	Fan control module	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Fan control module • Related wiring harness
1Z	Shift solenoid E*1	Shift solenoid E	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid E • Related wiring harness
	—*2	—	—		—	—
1AA	—	—	—		—	—
1AB	Brake	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harness
			Brake pedal released		Below 1.0	
1AC	APP sensor 2	APP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• APP sensor • Related wiring harness
1AD	Shift solenoid D*1	Shift solenoid D	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid D • Related wiring harness
	—*2	—	—		—	—
1AE	—	—	—		—	—
1AF	Manual down*1	Down switch	Ignition switch is turned to the ON position.	Detects down-shift operation of selector lever in M range	1.0 or less	• Selector lever • Related wiring harness
				Others	B+	
	—*2	—	—		—	—
1AG	Input/turbine speed sensor (–)*1	Input/turbine speed sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Input/turbine speed sensor • Related wiring harness
	—*2	—	—		—	—
1AH	Selector lever position*1	TR switch	Ignition switch is turned to the ON position	P position	Approx. 4.6	• TR switch • Related wiring harness
				R position	Approx. 3.9	
				N position	Approx. 3.2	
				D range	Approx. 2.5	
				M range	Approx. 2.5	
	—*2	—	—		—	—
1AI	CAN (L)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AJ	Manual up*1	Up switch	Ignition switch is turned to the ON position.	Detects up-shift operation of selector lever in M range	1.0 or less	• Selector lever • Related wiring harness
				Others	B+	
	—*2	—	—		—	—
1AK	MAF	MAF sensor	Ignition switch to the ON position		Approx. 0.7	• MAF sensor • Related wiring harness
			Idle (after warm up)		Approx. 1.5	
1AL	Constant voltage (Vref)	APP sensor	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness
1AM	CAN (H)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
1AN	M range switch*1	M range switch	Ignition switch is turned to the ON position.	M range	1.0 or less	• Selector lever • Related wiring harness
				Except above	B+	
	—*2	—	—		—	—
1AO	Input/turbine speed sensor (+)*1	Input/turbine speed sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Input/turbine speed sensor • Related wiring harness
	—*2	—	—		—	—
1AP	APP sensor 1	APP sensor	Ignition switch to the ON position	When the accelerator pedal is depressed	Approx. 3.0	• APP sensor • Related wiring harness
				When the accelerator pedal is released	Approx. 0.4	
1AQ	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Related wiring harnesses
				CANCEL switch pressed in	Approx. 1.1	
				SET/COAST switch pressed in	Approx. 3.1	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5	
1AR	Sensor GND	MAF sensor	Under any condition		Below 1.0	• Related wiring harness
1AS	Sensor GND	TFT sensor*1, TR switch*1, IAT sensor, APP sensor	Under any condition		Below 1.0	• Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AT	IAT	MAF/IAT sensor	Ignition switch to the ON position	IAT 0 °C {32 °F}	Approx. 3.43	• IAT sensor • Related wiring harness
				IAT 20 °C {68 °F}	Approx. 2.38	
				IAT 40 °C {104 °F}	Approx. 1.49	
				IAT 60 °C {140 °F}	Approx. 0.89	
				IAT 80 °C {176 °F}	Approx. 0.53	
				IAT 100 °C {212 °F}	Approx. 0.33	
1AU	A/C on signal	Refrigerant pressure switch (high and low)	Idle	A/C switch and fan switch on	Below 1.0	• Refrigerant pressure switch • Related wiring harness
1AV	—	—	—		—	—
1AW	Vehicle speed*1	VSS	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• VSS • Related wiring harness
	—*2	—	—		—	—
1AX	Drive-by-wire relay control	Drive-by-wire relay	Ignition switch off		B+→ Below 1.0	• Drive-by-wire relay • Related wiring harness
			Ignition switch to the ON position		Below 1.0	
1AY	Ignition switch	Ignition switch	Ignition switch off		Below 1.0	• Related wiring harness
			Ignition switch to the ON position		B+	
1AZ	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BA	Back-up power supply	Battery (positive terminal)	Under any condition		B+	• Battery • Related wiring harness
1BB	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BC	—	—	—		—	—
1BD	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BE	B+	Main relay	Ignition switch off after 15 min		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
1BF	B+	Drive-by-wire relay	Ignition switch off		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
1BG	B+*1	Main relay	Ignition switch off after 15 min		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
	—*2	—	—		—	—
1BH	GND	GND	Under any condition		Below 1.0	• Related wiring harness
2A	Throttle actuator control (+)	Throttle actuator	Ignition switch to the ON position		B+	• Throttle actuator • Related wiring harness
2B	Throttle actuator control (–)	Throttle actuator	Idle (after warm up)		Approx. 3.5—5.5	• Throttle actuator • Related wiring harness
2C	Purge control	Purge solenoid valve	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Purge solenoid valve • Related wiring harness
2D	—	—	—		—	—

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2E	OCV control	OCV	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• OCV valve • Related wiring harness
2F	—	—	—	—	—
2G	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2H	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2I	Variable tumble control	Variable tumble solenoid valve	ECT above 62 °C {143 °F} while idling.	B+	• Variable tumble solenoid valve • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm	Below 1.0	
2J	Variable intake air control	Variable intake air solenoid valve	Ignition switch to the ON position	Below 1.0	• Variable intake air solenoid valve • Related wiring harness
			Engine speed: below 4,750 rpm [LF]/4,600 rpm [L3]	Below 1.0	
			Engine speed: above 4,750 rpm [LF]/4,600 rpm [L3]	B+	
2K	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch to the ON position	Below 1.0	• EGR valve • Related wiring harness
			Idle	Below 1.0	
2L	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2M	—	—	—	—	—
2N	—	—	—	—	—
2O	—	—	—	—	—
2P	—	—	—	—	—
2Q	Rear HO2S	HO2S (rear)	Ignition switch to the ON position	Approx. 0	• HO2S (rear) • Related wiring harness
			Idle (after warm up)	Alternates between 0 and 1.0	
2R	Middle HO2S	HO2S (Middle)	Ignition switch to the ON position	Approx. 0	• HO2S (Middle) • Related wiring harness
			Idle (after warm up)	Alternates between 0 and 1.0	
2S	CMP	CMP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• CMP sensor • Related wiring harness
2T	—	—	—	—	—
2U	Knocking (+)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)	Approx. 4.3	• KS • Related wiring harness
2V	Knocking (–)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)	Below 1.0	• KS • Related wiring harness
2W	CKP	CKP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• CKP sensor • Related wiring harness
2X	GND (shield)	KS harness, HO2S (front, middle, rear) harness, GND	Under any condition	Below 1.0	• Related wiring harness
2Y	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2Z	Sensor GND	HO2S (front)	Under any condition		Below 1.0	• Related wiring harness
2AA	—	—	—		—	—
2AB	—	—	—		—	—
2AC	ATF temperature	TFT sensor	Ignition switch is turned to the ON position.	TFT is 20 °C {68 °F}	Approx. 3.3	• TFT sensor • Related wiring harness
				TFT is 40 °C {104 °F}	Approx. 2.4	
				TFT is 60 °C {140 °F}	Approx. 1.5	
2AD	Front HO2S	HO2S (front)	Idle (after warm up): Approx. 0 mA		—	• HO2S (front) • Related wiring harness
2AE	Variable tumble shutter valve monitor	Variable tumble shutter valve switch	ECT above 63 °C {145 °F} while idling.		B+	• Variable tumble shutter valve switch • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm		Below 1.0	
2AF	—	—	—		—	—
2AG	Manifold absolute pressure	MAP sensor	Ignition switch to the ON position (at sea level)		Approx. 4.1	• MAP sensor • Related wiring harness
			Idle		Approx. 1.4	
2AH	ECT	ECT sensor	Ignition switch to the ON position	IAT 20 °C {68 °F}	3.04—3.14	• ECT sensor • Related wiring harness
				IAT 40 °C {104 °F}	2.09—2.21	
				IAT 60 °C {140 °F}	1.29—1.39	
				IAT 80 °C {176 °F}	0.76—0.83	
				IAT 100 °C {212 °F}	0.45—0.49	
2AI	Generator field coil control	Generator (terminal D)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Following PIDs: IAT, ECT, RPM, VPWR, ALTT V • Generator • Related wiring harness
2AJ	Generator output voltage	Generator (terminal P)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
2AK	TP (No. 1)	TP sensor No. 1	Ignition switch to the ON position	APP closed	0.53—1.00	• TP sensor • Related wiring harness
				APP open	4.25—4.75	
2AL	TP (No. 2)	TP sensor No. 2	Ignition switch to the ON position	APP closed	4.00—4.47	• TP sensor • Related wiring harness
				APP open	0.25—0.75	
2AM	Constant voltage (Vref)	CMP sensor	Ignition switch to the ON position		B+	• CMP sensor • Related wiring harness
2AN	—	—	—		—	—
2AO	Constant voltage (Vref)	TP sensor	Ignition switch to the ON position		Approx. 5.0	• TP sensor • Related wiring harness
2AP	Sensor GND	TP sensor	Under any condition		Below 1.0	• TP sensor • Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2AQ	Constant voltage (Vref)	CKP sensor	Ignition switch to the ON position	B+	• CKP sensor • Related wiring harness
2AR	—	—	—	—	—
2AS	—	—	—	—	—
2AT	IGT4	Ignition coil (No.4 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AU	Constant voltage (Vref)	MAP sensor, variable tumble shutter valve switch	Ignition switch to the ON position	Approx. 5.0	• MAP sensor • Variable tumble shutter valve switch • Related wiring harness
2AV	—	—	—	—	—
2AW	IGT2	Ignition coil (No.2 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AX	IGT3	Ignition coil (No.3 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AY	Sensor GND	Variable tumble shutter valve switch, ECT sensor, MAP sensor, HO2S (middle, rear)	Under any condition	Below 1.0	• Variable tumble shutter valve switch • ECT sensor • MAP sensor • HO2S (middle, rear) • Related wiring harness
2AZ	Fuel injection (#4)	Fuel injector No.4	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.4 • Related wiring harness
2BA	IGT1	Ignition coil (No.1 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2BB	Fuel injection (#1)	Fuel injector No.1	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.1 • Related wiring harness
2BC	Fuel injection (#2)	Fuel injector No.2	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.2 • Related wiring harness
2BD	Fuel injection (#3)	Fuel injector No.3	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.3 • Related wiring harness
2BE	Rear H 2S heater control	HO2S (Rear) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Rear) heater • Related wiring harness
2BF	Middle HO2S heater control	HO2S (Middle) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Middle) heater • Related wiring harness
2BG	Front HO2S heater control	HO2S (Front) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Front) heater • Related wiring harness
2BH	GND	GND	Under any condition	Below 1.0	• Related wiring harness

*1 : ATX
*2 : MTX

Except for California emission regulation applicable model with LF ATX

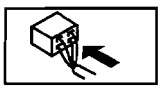
Note

- The PCM terminal voltage can vary with the conditions when measuring and changes due to aged deterioration on the vehicle, causing false diagnosis. Therefore determine comprehensively where the malfunction occurs among the input systems, output systems, and the PCM.

PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



am3uuw0000054

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1A	B+	Main relay	Ignition switch off after 5 min		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
1B	Shift solenoid A	Shift solenoid A	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid A • Related wiring harness
1C	Shift solenoid B	Shift solenoid B	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid B • Related wiring harness
1D	Shift solenoid C	Shift solenoid C	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Shift solenoid C • Related wiring harness
1E	Shift solenoid D	Shift solenoid D	During TCC operation		B+	• Shift solenoid D • Related wiring harness
			Except above		1.0 or less	
1F	Shift solenoid E	Shift solenoid E	During TCC operation		B+	• Shift solenoid E • Related wiring harness
			Except above		1.0 or less	
1G	Pressure control solenoid (+)	Pressure control solenoid	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Pressure control solenoid • Related wiring harness
1H	Pressure control solenoid (–)	Pressure control solenoid	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Pressure control solenoid • Related wiring harness
1I	—	—	—		—	—
1J	Vehicle speed	VSS	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• VSS • Related wiring harness
1K	Manual up	Up switch	Ignition switch is turned to the ON position.	Detects up-shift operation of selector lever in M range	1.0 or less	• Selector lever • Related wiring harness
				Others	B+	
1L	—	—	—		—	—
1M	Input/turbine speed sensor (+)	Input/turbine speed sensor	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Input/turbine speed sensor • Related wiring harness
1N	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1O	M range switch	M range switch	Ignition switch is turned to the ON position.	M range	1.0 or less	• Selector lever • Related wiring harness
				Except above	B+	
1P	Manual down	Down switch	Ignition switch is turned to the ON position.	Detects down-shift operation of selector lever in M range	1.0 or less	• Selector lever • Related wiring harness
				Others	B+	
1Q	Input/turbine speed sensor (–)	Input/turbine speed sensor	(See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Input/turbine speed sensor • Related wiring harness
1R	Refrigerant pressure switch (medium)	Refrigerant pressure switch (medium)	A/C ON	Refrigerant pressure is above 1.52 MPa {15.5 kgf/cm^2, 220 psi}	Below 1.0	• Refrigerant pressure switch • Related wiring harness
				Refrigerant pressure is below 1.23 MPa {12.5 kgf/cm^2, 178 psi}	B+	
1S	Selector lever position	TR switch	Ignition switch is turned to the ON position	P position	Approx. 4.6	• TR switch • Related wiring harness
				R position	Approx. 3.9	
				N position	Approx. 3.2	
				D range	Approx. 2.5	
				M range	Approx. 2.5	
1T	—	—	—		—	—
1U	ATF temperature	TFT sensor	Ignition switch is turned to the ON position.	TFT is 20 °C {68 °F}	Approx. 3.3	• TFT sensor • Related wiring harness
				TFT is 40 °C {104 °F}	Approx. 2.4	
				TFT is 60 °C {140 °F}	Approx. 1.5	
1V	—	—	—		—	—
1W	Cooling fan control	Fan control module	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Fan control module. • Related wiring harness
1X	—	—	—		—	—
1Y	APP sensor 1	APP sensor	Ignition switch to the ON position	When the accelerator pedal is depressed	Approx. 3.0	• APP sensor • Related wiring harness
				When the accelerator pedal is released	Approx. 0.4	
1Z	—	—	—		—	—
1AA	Sensor GND	TR sensor, TFT sensor, IAT sensor, APP sensor	Under any condition		Below 1.0	• Related wiring harness
1AB	Starter relay control	Starter relay	Under any condition		Below 1.0	• Starter relay • Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AC	MAF	MAF sensor	Ignition switch to the ON position		Approx. 0.7	• MAF sensor • Related wiring harness
			Idle (after warm up)		Approx. 1.3	
1AD	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Related wiring harnesses
				CANCEL switch pressed in	Approx. 1.1	
				SET/COAST switch pressed in	Approx. 3.1	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5	
1AE	Sensor GND	MAF sensor	Under any condition		Below 1.0	• Related wiring harness
1AF	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
1AG	Atmospheric pressure	BARO sensor	Ignition switch to the ON position (at sea level)		Approx. 4.0	• BARO sensor • Related wiring harness
1AH	IAT	MAF/IAT sensor	Ignition switch to the ON position	IAT 0 °C {32 °F}	Approx. 3.43	• IAT sensor • Related wiring harness
				IAT 20 °C {68 °F}	Approx. 2.38	
				IAT 40 °C {104 °F}	Approx. 1.49	
				IAT 60 °C {140 °F}	Approx. 0.89	
				IAT 80 °C {176 °F}	Approx. 0.53	
				IAT 100 °C {212 °F}	Approx. 0.33	
1AI	CAN (L)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
1AJ	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
1AK	—	—	—		—	—
1AL	APP sensor 2	APP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• APP sensor • Related wiring harness
1AM	CAN (H)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
1AN	A/C	A/C relay	Idle	A/C operating	Below 1.0	• A/C relay • Related wiring harness
				A/C not operating	B+	
1AO	—	—	—		—	—
1AP	A/C on signal	Refrigerant pressure switch (high and low)	Idle	A/C switch and fan switch on	Below 1.0	• Refrigerant pressure switch • Related wiring harness
1AQ	—	—	—		—	—

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1AR	Fuel pump control	Fuel pump relay	Ignition switch to the ON position after 1 s	B+	• Fuel pump relay • Related wiring harness
			Cranking	Below 1.0	
			Idle	Below 1.0	
1AS	—	—	—	—	—
1AT	Main relay control	Main relay	Ignition switch off after 5 min	B+	• Main relay • Related wiring harness
			Ignition switch to the ON position	Below 1.0	
1AU	Brake	Brake switch	Brake pedal depressed	B+	• Brake switch • Related wiring harness
			Brake pedal released	Below 1.0	
1AV	GND (shield)	Input/turbine speed sensor harness, GND	Under any condition	Below 1.0	• Related wiring harness
1AW	Constant voltage (Vref)	APP sensor	Ignition switch to the ON position	Approx. 5.0	• Related wiring harness
1AX	Ignition switch	Ignition switch	Ignition switch off	Below 1.0	• Related wiring harness
			Ignition switch to the ON position	B+	
1AY	Drive-by-wire relay	Drive-by-wire relay	Ignition switch off	B+	• Related wiring harness
			Ignition switch to the ON position	Below 1.0	
1AZ	GND	GND	Under any condition	Below 1.0	• Related wiring harness
1BA	Back-up power supply	Battery (positive terminal)	Under any condition	B+	• Battery • Related wiring harness
1BB	GND	GND	Under any condition	Below 1.0	• Related wiring harness
1BC	GND	GND	Under any condition	Below 1.0	• Related wiring harness
1BD	GND	GND	Under any condition	Below 1.0	• Related wiring harness
1BE	B+	Main relay	Ignition switch off after 5 min	Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position	B+	
1BF	Throttle actuator power supply	Drive-by-wire relay	Ignition switch off after 10 s	Below 1.0	• Related wiring harness
			Ignition switch to the ON position	B+	
1BG	GND	GND	Under any condition	Below 1.0	• Related wiring harness
1BH	GND	GND	Under any condition	Below 1.0	• Related wiring harness
2A	Throttle actuator control (+)	Throttle actuator	Ignition switch to the ON position	B+	• Throttle actuator • Related wiring harness
2B	Throttle actuator control (–)	Throttle actuator	Idle (after warm up)	Approx. 3.5—5.5	• Throttle actuator • Related wiring harness
2C	Rear HO2S heater control	HO2S (Rear) heater	Idle (after warm up)	Below 1.0	• HO2S (Rear) heater • Related wiring harness
			Engine speed above 4,000 rpm	B+	
2D	—	—	—	—	—
2E	—	—	—	—	—
2F	—	—	—	—	—
2G	Front HO2S heater control	HO2S (Front) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Front) heater • Related wiring harness
2H	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2I	TP (No. 2)	TP sensor No. 2	Ignition switch to the ON position	APP closed	4.00—4.47	• TP sensor • Related wiring harness
				APP open	0.25—0.75	
2J	—	—	—		—	—
2K	Constant voltage (Vref)	TP sensor	Ignition switch to the ON position		Approx. 5.0	• TP sensor • Related wiring harness
2L	—	—	—		—	—
2M	TP (No. 1)	TP sensor No. 1	Ignition switch to the ON position	APP closed	0.53—1.00	• TP sensor • Related wiring harness
				APP open	4.25—4.75	
2N	—	—	—		—	—
2O	TP sensor GND	TP sensor	Under any condition		Below 1.0	• TP sensor • Related wiring harness
2P	GND (shield)	KS harness, HO2S (front, rear), GND	Under any condition		Below 1.0	• Related wiring harness
2Q	Knocking (+)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Approx. 4.3	• KS • Related wiring harness
2R	Knocking (–)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Below 1.0	• KS • Related wiring harness
2S	—	—	—		—	—
2T	Constant voltage (Vref)	CKP sensor	Ignition switch to the ON position		B+	• CKP sensor • Related wiring harness
2U	CKP	CKP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• CKP sensor • Related wiring harness
2V	CMP	CMP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
2W	Constant voltage (Vref)	MAP sensor, variable tumble shutter valve switch	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness
2X	Constant voltage (Vref)	CMP sensor	Ignition switch to the ON position		B+	• CKP sensor • Related wiring harness
2Y	—	—	—		—	—
2Z	HO2S (front) power supply	HO2S (front)	Idle (after warm up)		Approx. 4.1	• HO2S (front) • Related wiring harness
2AA	Sensor GND	HO2S (rear), ECT sensor, MAP sensor, variable tumble shutter valve switch	Under any condition		Below 1.0	• Related wiring harness
2AB	—	—	—		—	—
2AC	HO2S (front) VSIP	HO2S (front)	Idle (after warm up)		Approx. 4.0	• HO2S (front) • Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2AD	HO2S (front) IP+	HO2S (front)	When the engine speed is increased, the voltage increased.			• HO2S (front) • Related wiring harness
2AE	Variable tumble shutter valve monitor	Variable tumble shutter valve switch	ECT above 63 °C {145 °F} while idling.		B+	• Variable tumble shutter valve switch • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm		Below 1.0	
2AF	OCV control	OCV	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• OCV valve • Related wiring harness
2AG	Front HO2S	HO2S (front)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• HO2S (front) • Related wiring harness
2AH	Rear HO2S	HO2S (rear)	Ignition switch to the ON position		Approx. 0	• HO2S (rear) • Related wiring harness
			Idle (after warm up)		Alternates between 0 and 1.0	
2AI	Variable tumble control	Variable tumble solenoid valve	ECT above 62 °C {143 °F} while idling.		B+	• Variable tumble solenoid valve • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm		Below 1.0	
2AJ	Variable intake air control	Variable intake air solenoid valve	Ignition switch to the ON position		Below 1.0	• Variable intake air solenoid valve • Related wiring harness
			Engine speed: below 4,750 rpm		Below 1.0	
			Engine speed: above 4,750 rpm		B+	
2AK	ECT	ECT sensor	Ignition switch to the ON position	IAT 20 °C {68 °F}	3.04—3.14	• ECT sensor • Related wiring harness
				IAT 40 °C {104 °F}	2.09—2.21	
				IAT 60 °C {140 °F}	1.29—1.39	
				IAT 80 °C {176 °F}	0.76—0.83	
				IAT 100 °C {212 °F}	0.45—0.49	
2AL	Manifold absolute pressure	MAP sensor	Ignition switch to the ON position (at sea level)		Approx. 4.1	• MAP sensor • Related wiring harness
			Idle		Approx. 1.2	
2AM	Generator output voltage	Generator (terminal P)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
2AN	Purge control	Purge solenoid valve	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Purge solenoid valve • Related wiring harness
2AO	—	—	—		—	—
2AP	—	—	—		—	—
2AQ	Generator field coil control	Generator (terminal D)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Following PIDs: IAT, ECT, RPM, VPWR, ALTT V. • Generator • Related wiring harness
2AR	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Idle		B+	
2AS	—	—	—		—	—
2AT	—	—	—		—	—
2AU	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch to the ON position		Below 1.0	• EGR valve • Related wiring harness
			Idle		Below 1.0	

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2AV	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch to the ON position	Below 1.0	• EGR valve • Related wiring harness
			Idle	Below 1.0	
2AW	—	—	—	—	—
2AX	—	—	—	—	—
2AY	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2AZ	Fuel injection (#4)	Fuel injector No.4	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.4 • Related wiring harness
2BA	—	—	—	—	—
2BB	Fuel injection (#1)	Fuel injector No.1	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.1 • Related wiring harness
2BC	Fuel injection (#2)	Fuel injector No.2	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.2 • Related wiring harness
2BD	Fuel injection (#3)	Fuel injector No.3	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.3 • Related wiring harness
2BE	IGT1	Ignition coil (No.1 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2BF	IGT2	Ignition coil (No.2 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2BG	IGT3	Ignition coil (No.3 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2BH	IGT4	Ignition coil (No.4 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness

Except for California emission regulation applicable model with LF MTX and L3

Note

- The PCM terminal voltage can vary with the conditions when measuring and changes due to aged deterioration on the vehicle, causing false diagnosis. Therefore determine comprehensively where the malfunction occurs among the input systems, output systems, and the PCM.

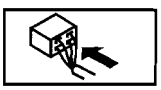
PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B

2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B

1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



am3uuw0000054

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1A	—	—	—	—	—
1B	Starter relay control	Starter relay	Under any condition	Below 1.0	• Starter relay • Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1C	—	—	—		—	—
1D	—*1	—	—		—	—
	Clutch operation*2	CPP switch	Clutch pedal depressed		Below 1.0	• CPP switch • Related wiring harness
			Clutch pedal released		B+	
1E	—	—	—		—	—
1F	—	—	—		—	—
1G	—	—	—		—	—
1H	Fuel pump control	Fuel pump relay	Ignition switch to the ON position		B+	• Fuel pump relay • Related wiring harness
			Cranking		Below 1.0	
			Idle		Below 1.0	
1I	A/C	A/C relay	Idle	A/C operating	Below 1.0	• A/C relay • Related wiring harness
				A/C not operating	B+	
1J	Refrigerant pressure switch (medium)	Refrigerant pressure switch (medium)	A/C ON	Refrigerant pressure is above 1.52 MPa {15.5 kgf/cm^2, 220 psi}	Below 1.0	• Refrigerant pressure switch • Related wiring harness
				Refrigerant pressure is below 1.23 MPa {12.5 kgf/cm^2, 178 psi}	B+	
1K	—	—	—		—	—
1L	—	—	—		—	—
1M	—	—	—		—	—
1N	—	—	—		—	—
1O	—	—	—		—	—
1P	—	—	—		—	—
1Q	Main relay control	Main relay	Ignition switch off after 15 min		B+	• Main relay • Related wiring harness
			Ignition switch to the ON position		Below 1.0	
1R	Cooling fan control	Fan control module	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Fan control module • Related wiring harness
1S	—	—	—		—	—
1T	—	—	—		—	—
1U	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
1V	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harnesses
			Idling		B+	
1W	—	—	—		—	—
1X	—*1	—	—		—	—
	Neutral position*2	Neutral switch	Ignition switch is turned to the ON position	Shift lever is at neutral position	Below 1.0	• Neutral switch • Related wiring harness
				Shift lever is not at neutral position	B+	
1Y	—	—	—		—	—
1Z	—	—	—		—	—
1AA	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AB	Brake	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harness
			Brake pedal released		Below 1.0	
1AC	—	—	—		—	—
1AD	—	—	—		—	—
1AE	—	—	—		—	—
1AF	—	—	—		—	—
1AG	—	—	—		—	—
1AH	—	—	—		—	—
1AI	CAN (L)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
1AJ	—	—	—		—	—
1AK	MAF	MAF sensor	Ignition switch to the ON position		Approx. 0.7	• MAF sensor • Related wiring harness
			Idle (after warm up)		Approx. 1.5	
1AL	Constant voltage (Vref)	APP sensor	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness
1AM	CAN (H)	Instrument cluster, ABS HU/CM, EHPAS control module	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.			• Related wiring harness
1AN	—	—	—		—	—
1AO	APP sensor 2	APP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• APP sensor • Related wiring harness
1AP	APP sensor 1	APP sensor	Ignition switch to the ON position	When the accelerator pedal is depressed	Approx. 3.0	• APP sensor • Related wiring harness
				When the accelerator pedal is released	Approx. 0.4	
1AQ	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Related wiring harnesses
				CANCEL switch pressed in	Approx. 1.1	
				SET/COAST switch pressed in	Approx. 3.1	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5	
1AR	Sensor GND	MAF sensor	Under any condition		Below 1.0	• Related wiring harness
1AS	—	—	—		—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AT	IAT	MAF/IAT sensor	Ignition switch to the ON position	IAT 0 °C {32 °F}	Approx. 3.43	• IAT sensor • Related wiring harness
				IAT 20 °C {68 °F}	Approx. 2.38	
				IAT 40 °C {104 °F}	Approx. 1.49	
				IAT 60 °C {140 °F}	Approx. 0.89	
				IAT 80 °C {176 °F}	Approx. 0.53	
				IAT 100 °C {212 °F}	Approx. 0.33	
1AU	A/C on signal	Refrigerant pressure switch (high and low)	Idle	A/C switch and fan switch on	Below 1.0	• Refrigerant pressure switch • Related wiring harness
1AV	Sensor GND	IAT sensor, APP sensor	Under any condition		Below 1.0	• Related wiring harness
1AW	—	—	—		—	—
1AX	Drive-by-wire relay control	Drive-by-wire relay	Ignition switch off		B+→ Below 1.0	• Drive-by-wire relay • Related wiring harness
			Ignition switch to the ON position		Below 1.0	
1AY	Ignition switch	Ignition switch	Ignition switch off		Below 1.0	• Related wiring harness
			Ignition switch to the ON position		B+	
1AZ	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BA	Back-up power supply	Battery (positive terminal)	Under any condition		B+	• Battery • Related wiring harness
1BB	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BC	—	—	—		—	—
1BD	GND	GND	Under any condition		Below 1.0	• Related wiring harness
1BE	B+	Main relay	Ignition switch off after 15 min		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
1BF	B+	Drive-by-wire relay	Ignition switch off		Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position		B+	
1BG	—	—	—		—	—
1BH	GND	GND	Under any condition		Below 1.0	• Related wiring harness
2A	Throttle actuator control (+)	Throttle actuator	Ignition switch to the ON position		B+	• Throttle actuator • Related wiring harness
2B	Throttle actuator control (–)	Throttle actuator	Idle (after warm up)		Approx. 3.5—5.5	• Throttle actuator • Related wiring harness
2C	Purge control	Purge solenoid valve	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Purge solenoid valve • Related wiring harness
2D	—	—	—		—	—
2E	OCV control	OCV	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• OCV valve • Related wiring harness
2F	—	—	—		—	—
2G	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Idle		B+	

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2H	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2I	Variable tumble control	Variable tumble solenoid valve	ECT above 62 °C {143 °F} while idling.	B+	• Variable tumble solenoid valve • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm	Below 1.0	
2J	Variable intake air control	Variable intake air solenoid valve	Ignition switch to the ON position	Below 1.0	• Variable intake air solenoid valve • Related wiring harness
			Engine speed: below 4,750 rpm [LF]/4,600 rpm [L3]	Below 1.0	
			Engine speed: above 4,750 rpm [LF]/4,600 rpm [L3]	B+	
2K	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch to the ON position	Below 1.0	• EGR valve • Related wiring harness
			Idle	Below 1.0	
2L	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch to the ON position	B+	• EGR valve • Related wiring harness
			Idle	B+	
2M	—	—	—	—	—
2N	—	—	—	—	—
2O	—	—	—	—	—
2P	Sensor GND	Variable tumble shutter valve switch, ECT sensor, MAP sensor, HO2S (middle, rear)	Under any condition	Below 1.0	• Variable tumble shutter valve switch • ECT sensor • MAP sensor • HO2S (middle, rear) • Related wiring harness
2Q	Rear HO2S	HO2S (rear)	Ignition switch to the ON position	Approx. 0	• HO2S (rear) • Related wiring harness
			Idle (after warm up)	Alternates between 0 and 1.0	
2R	—	—	—	—	—
2S	CMP	CMP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• CMP sensor • Related wiring harness
2T	—	—	—	—	—
2U	Knocking (+)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)	Approx. 4.3	• KS • Related wiring harness
2V	Knocking (–)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)	Below 1.0	• KS • Related wiring harness
2W	CKP	CKP sensor	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• CKP sensor • Related wiring harness
2X	GND (shield)	KS harness, HO2S (front, middle, rear) harness, GND	Under any condition	Below 1.0	• Related wiring harness
2Y	—	—	—	—	—
2Z	HO2S (front) power supply	HO2S (front)	Idle (after warm up)	Approx. 4.1	• HO2S (front) • Related wiring harness
2AA	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2AB	—	—	—		—	—
2AC	HO2S (front) VSIP	HO2S (front)	Idle (after warm up)		Approx. 4.0	• HO2S (front) • Related wiring harness
2AD	HO2S (front) IP+	HO2S (front)	When the engine speed is increased, the voltage increased.			• HO2S (front) • Related wiring harness
2AE	Variable tumble shutter valve monitor	Variable tumble shutter valve switch	ECT above 63 °C {145 °F} while idling.		B+	• Variable tumble shutter valve switch • Related wiring harness
			ECT below 63 °C {145 °F} and engine speed below 3,750 rpm		Below 1.0	
2AF	—	—	—		—	—
2AG	Manifold absolute pressure	MAP sensor	Ignition switch to the ON position (at sea level)		Approx. 4.1	• MAP sensor • Related wiring harness
			Idle		Approx. 1.4	
2AH	ECT	ECT sensor	Ignition switch to the ON position	IAT 20 °C {68 °F}	3.04—3.14	• ECT sensor • Related wiring harness
				IAT 40 °C {104 °F}	2.09—2.21	
				IAT 60 °C {140 °F}	1.29—1.39	
				IAT 80 °C {176 °F}	0.76—0.83	
				IAT 100 °C {212 °F}	0.45—0.49	
2AI	Generator field coil control	Generator (terminal D)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Following PIDs: IAT, ECT, RPM, VPWR, ALTT V • Generator • Related wiring harness
2AJ	Generator output voltage	Generator (terminal P)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
2AK	TP (No. 1)	TP sensor No. 1	Ignition switch to the ON position	APP closed	0.53—1.00	• TP sensor • Related wiring harness
				APP open	4.25—4.75	
2AL	TP (No. 2)	TP sensor No. 2	Ignition switch to the ON position	APP closed	4.00—4.47	• TP sensor • Related wiring harness
				APP open	0.25—0.75	
2AM	Constant voltage (Vref)	CMP sensor	Ignition switch to the ON position		B+	• CMP sensor • Related wiring harness
2AN	—	—	—		—	—
2AO	Constant voltage (Vref)	TP sensor	Ignition switch to the ON position		Approx. 5.0	• TP sensor • Related wiring harness
2AP	Sensor GND	TP sensor	Under any condition		Below 1.0	• TP sensor • Related wiring harness
2AQ	Constant voltage (Vref)	CKP sensor	Ignition switch to the ON position		B+	• CKP sensor • Related wiring harness
2AR	Constant voltage (Vref)	MAP sensor, variable tumble shutter valve switch	Ignition switch to the ON position		Approx. 5.0	• MAP sensor • Variable tumble shutter valve switch • Related wiring harness

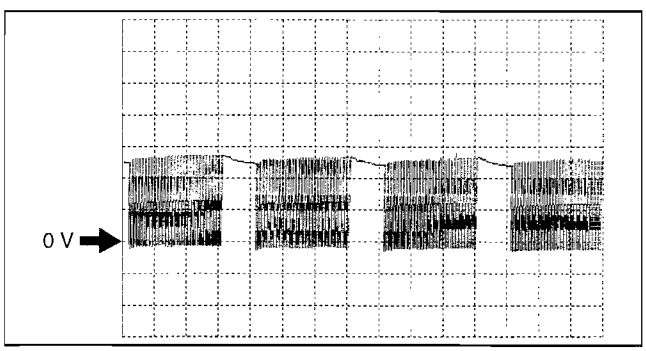
Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2AS	—	—	—	—	—
2AT	IGT4	Ignition coil (No.4 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AU	—	—	—	—	—
2AV	—	—	—	—	—
2AW	IGT2	Ignition coil (No.2 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AX	IGT3	Ignition coil (No.3 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2AY	—	—	—	—	—
2AZ	Fuel injection (#4)	Fuel injector No.4	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.4 • Related wiring harness
2BA	IGT1	Ignition coil (No.1 cylinders)	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Ignition coil • Related wiring harness
2BB	Fuel injection (#1)	Fuel injector No.1	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.1 • Related wiring harness
2BC	Fuel injection (#2)	Fuel injector No.2	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.2 • Related wiring harness
2BD	Fuel injection (#3)	Fuel injector No.3	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.3 • Related wiring harness
2BE	Rear HO2S heater control	HO2S (Rear) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Rear) heater • Related wiring harness
2BF	—	—	—	—	—
2BG	Front HO2S heater control	HO2S (Front) heater	• Inspect using the wave profile. (See 01-40A-33 Inspection Using An Oscilloscope (Reference).)		• HO2S (Front) heater • Related wiring harness
2BH	—	—	—	—	—

*1 : ATX
*2 : MTX

Inspection Using An Oscilloscope (Reference)
Shift solenoid A signal
PCM terminals
- 1A*1, 1B*2 (+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 4GR

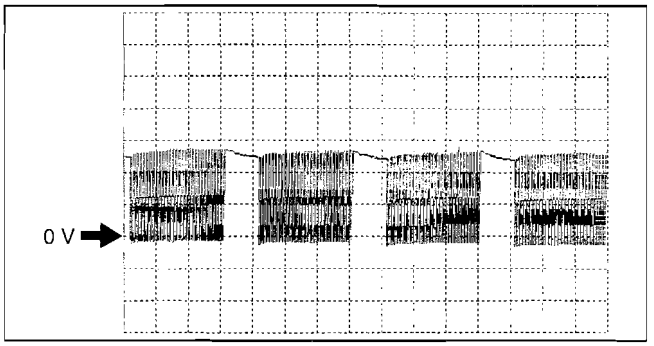


am3uuw0000054

Shift solenoid B signal
PCM terminals
- 1E*1, 1C*2 (+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 1GR

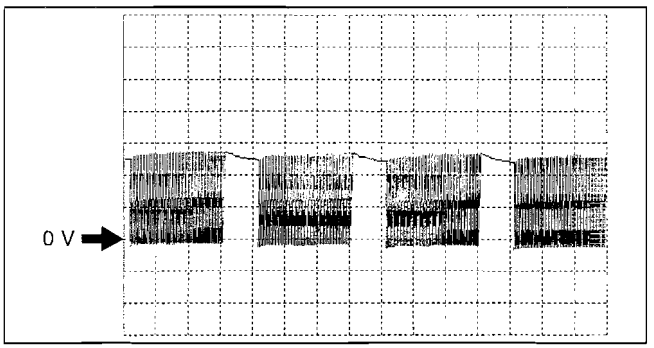


am3uuw0000055

Shift solenoid C signal
PCM terminals
- 1F*1, 1D*2 (+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 1GR or 2GR

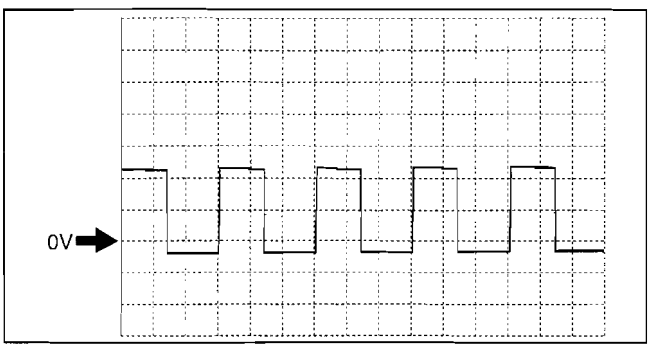


am3uuw0000055

Pressure control solenoid (+) signal
PCM terminals
- 1M*1, 1G*2 (+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- All of the following conditions are met.
  - — Ignition switch is turned to the ON position. (engine off)
  - — P or N position
  - — CTP

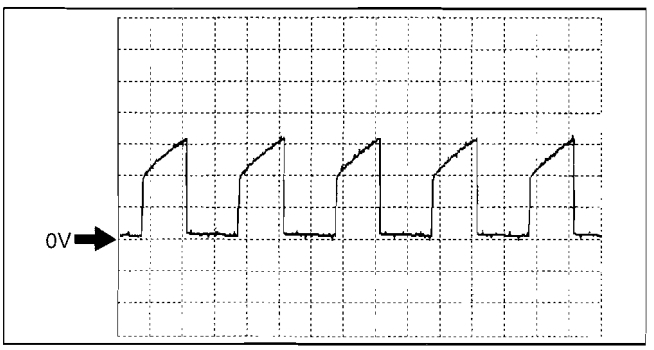


am3uuw0000055

Pressure control solenoid (–) signal
PCM terminals
- 1N*1, 1H*2 (+)—body ground (–)

Oscilloscope setting
- 200 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- All of the following conditions are met.
  - — Ignition switch is turned to the ON position. (engine off)
  - — P or N position
  - — CTP

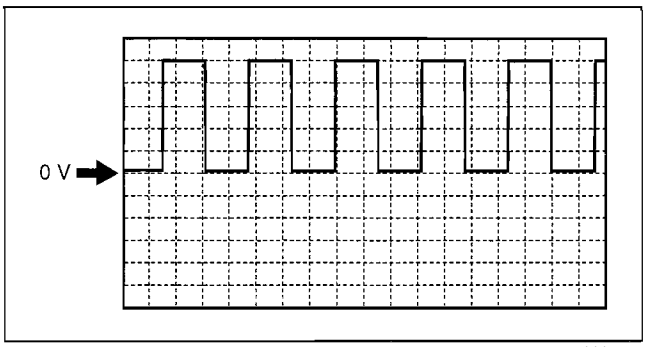


am3uuw0000055

Vehicle speed signal (ATX)
PCM terminals
- 1AW*1, 1J*2 (+)—body ground (–)

Oscilloscope setting
- 1 V/DIV (Y), 2.5 ms/DIV (X), DC range

Vehicle condition
- Vehicle speed is 32 km/h {20 mph}.

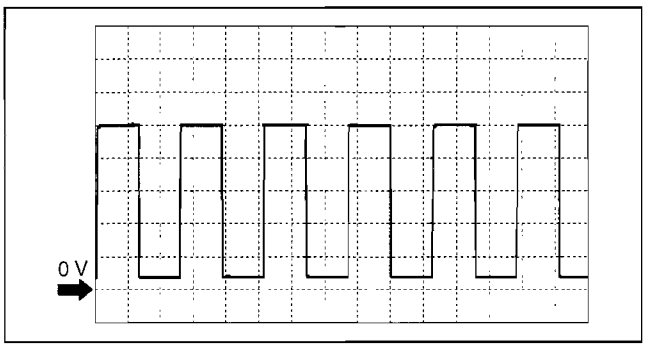


am3uuw0000055

Vehicle speed signal (MTX)
PCM terminals
- 2M (+)—2N (–)

Oscilloscope setting
- 1 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Vehicle speed is 10 km/h {6.2 mph}.

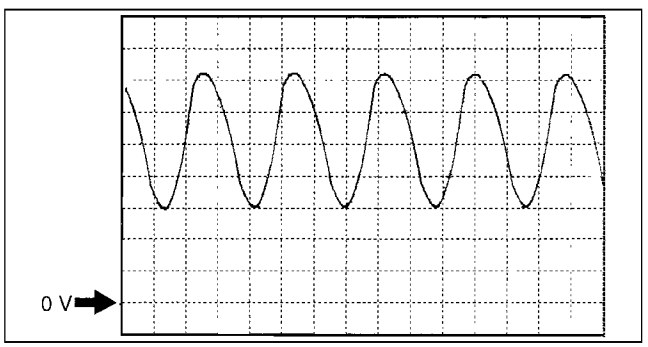


am3uuw0000055

Input/turbine speed sensor (+) signal
PCM terminals
- 1AO*1, 1M*2 (+)—body ground (–)

Oscilloscope setting
- 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm-up (no load, P/S off, A/C off)

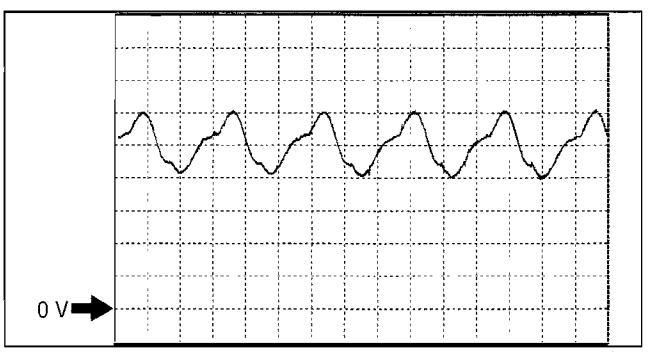


am3uuw0000055

Input/turbine speed sensor (–) signal
PCM terminals
- 1AG*1, 1Q*2 (+)—body ground (–)

Oscilloscope setting
- 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm-up (no load, P/S off, A/C off)

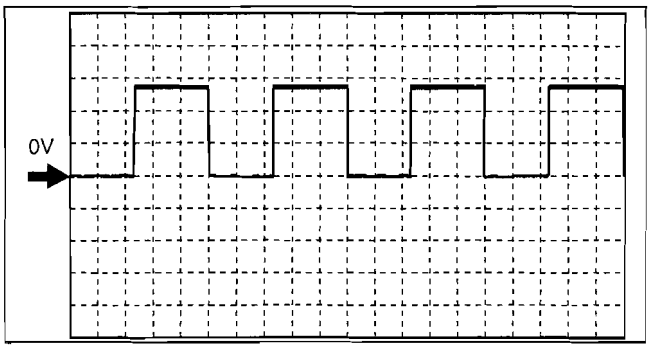


am3uuw0000055

Cooling fan control signals
PCM terminals
- 1Y*1, 1W*3, 1R*4(+)—body ground (–)

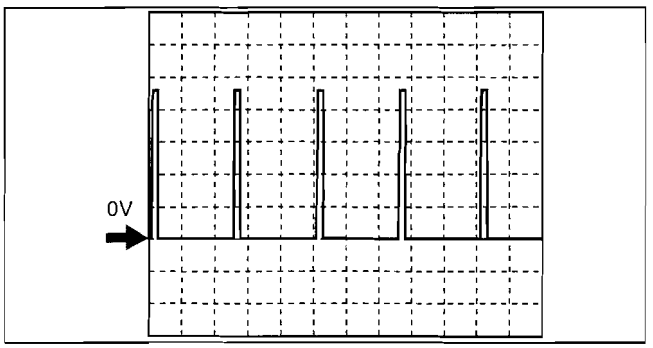
Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, A/C ON)



am3uuw0000055

APP signal
Accelerator pedal is released

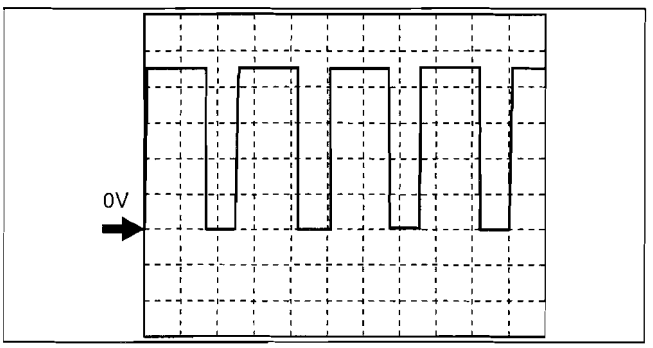


c3u0140w016

Accelerator pedal is depressed
PCM terminals
- 1AC*1, 1AL*3, 1AO*4(+)—body ground (–)

Oscilloscope setting
- 2.5 V/DIV (Y), 2 ms/DIV (X), DC range

Vehicle condition
- Ignition switch is turned to the ON position. (engine off)

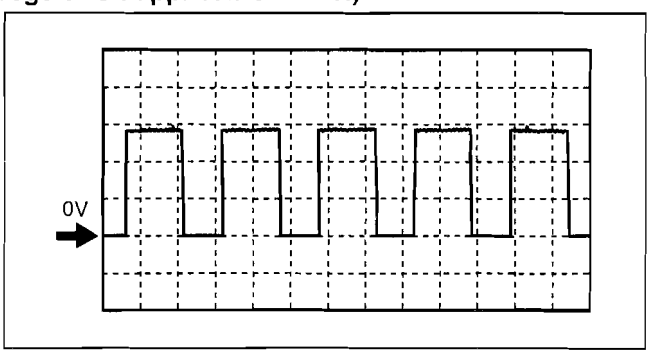


c3u0140w017

HO2S (front) heater control signal (California emission regulation applicable model)
PCM terminals
- 2BG(+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 50 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

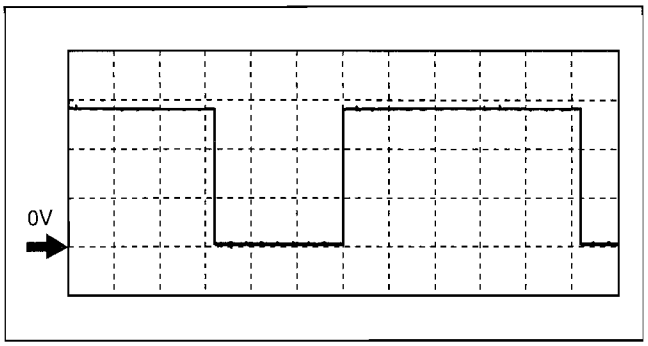


am3uuw0000055

HO2S (front) heater control signal (except for California emission regulation applicable model)
PCM terminals
- 2G*3, 2BG*4(+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 125 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

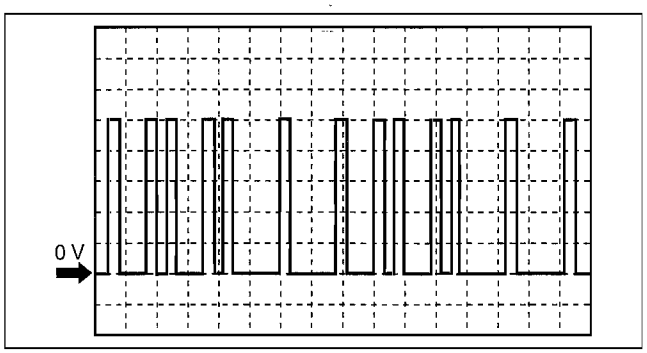


am3uuw0000056

CMP sensor signal
PCM terminals
- 2S*1*4, 2V*3(+)—body ground(–)

Oscilloscope setting
- 1 V/DIV (Y), 25 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

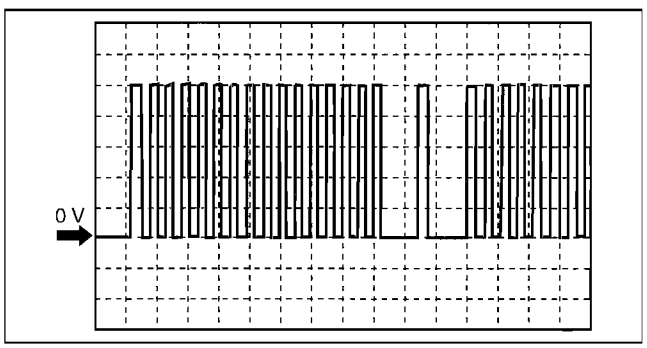


am3uuw0000056

CKP sensor signal
PCM terminals
- 2W*1*4, 2U*3(+)—body ground(–)

Oscilloscope setting
- 1 V/DIV (Y), 2.5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

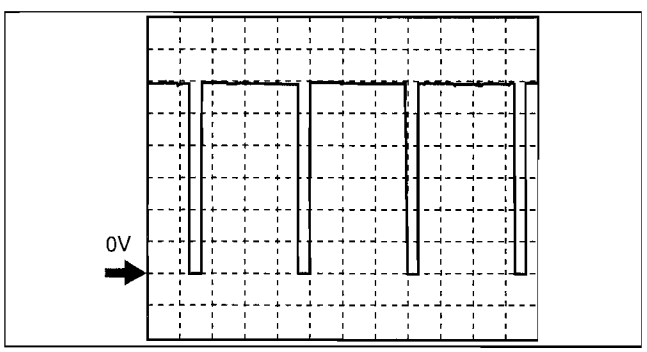


am3uuw0000056

OCV signal
PCM terminals
- 2E*1*4, 2AF*3(+)—body ground (–)

Oscilloscope setting
- 2.5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

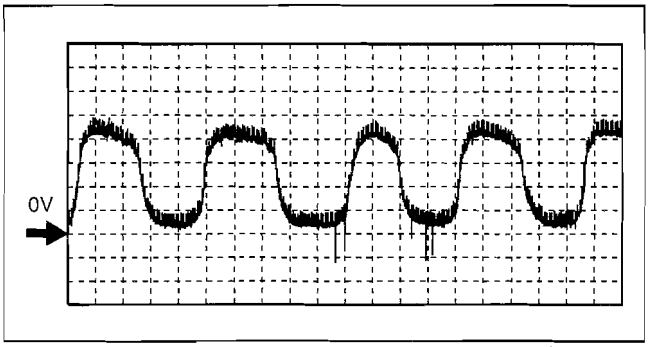


am3uuw0000056

HO2S (front) signal (except for California emission regulation applicable model)
PCM terminals
- 2AG(+)—body ground (–)

Oscilloscope setting
- 0.2 V/DIV (Y), 500 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

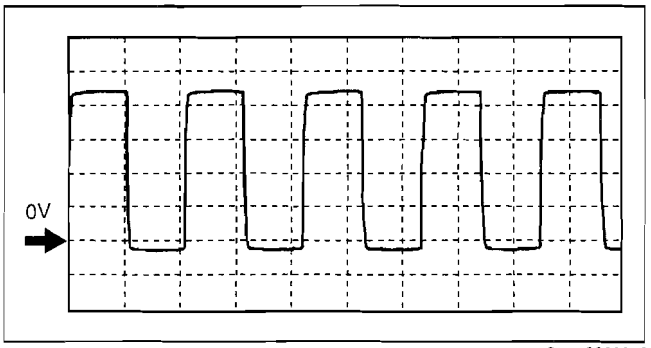


am3uuw0000056

Generator output voltage signal
PCM terminals
- 2AJ*1*4, 2AM*3 (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 2.5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

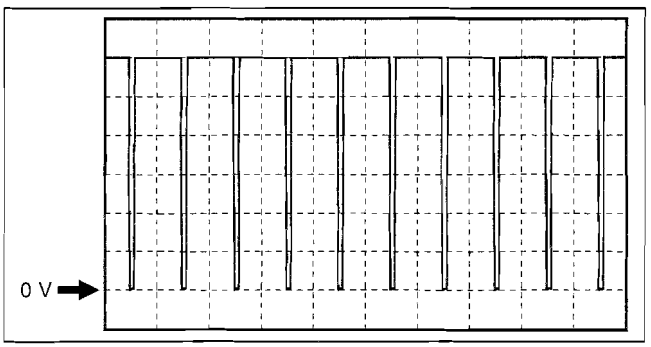


am3uuw0000056

Purge control signal
PCM terminals
- 2C*1*4, 2AN*3 (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 0.1 s/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

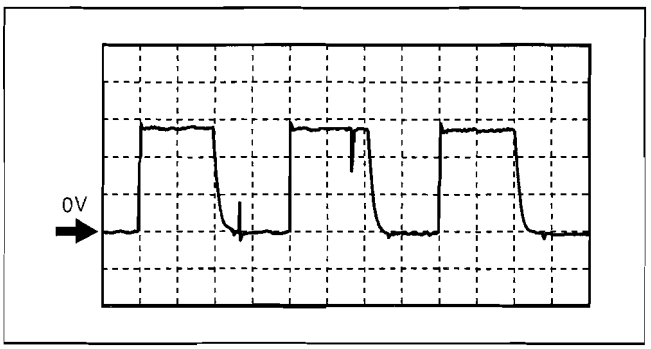


am3uuw0000056

Generator field coil control signal
PCM terminals
- 2AI*1*4, 2AQ*3(+)—body ground (–)

Oscilloscope setting
- 0.5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)



am3uuw0000056

Fuel injection control

PCM terminals

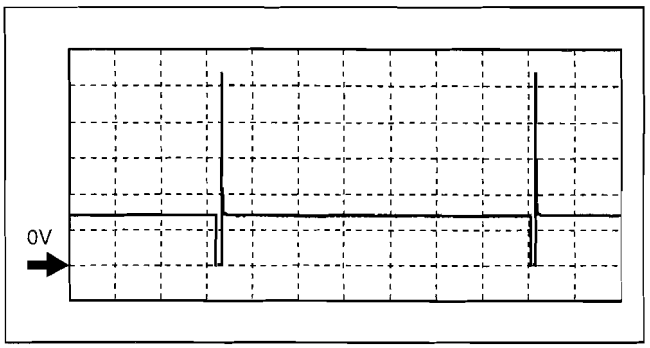
- Fuel injection No.1: 2BB(+)—body ground (–)
- Fuel injection No.2: 2BC(+)—body ground (–)
- Fuel injection No.3: 2BD(+)—body ground (–)
- Fuel injection No.4: 2AZ(+)—body ground (–)

Oscilloscope setting

- 10 V/DIV (Y), 25 ms/DIV (X), DC range

Vehicle condition

- Idle after warm up (no load, P/S off, A/C off)



am3uuw0000056

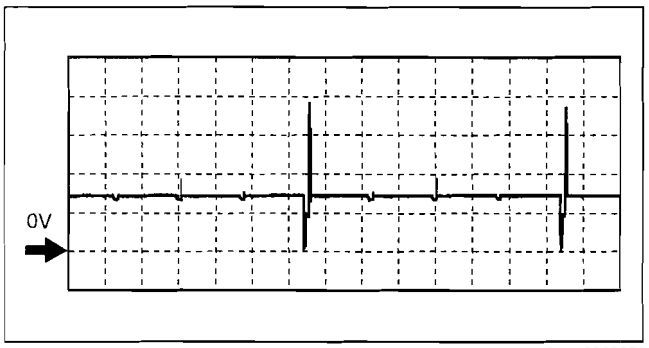
IGT1, IGT2, IG3, IG4 control signals

PCM terminals*1*4

- IGT1 (No.1): 2BA(+)—body ground (–)
- IGT2 (No.2): 2AW(+)—body ground (–)
- IGT3 (No.3): 2AX(+)—body ground (–)
- IGT4 (No.4): 2AT(+)—body ground (–)

PCM terminals*3

- IGT1 (No.1): 2BE(+)—body ground (–)
- IGT2 (No.2): 2BF(+)—body ground (–)
- IGT3 (No.3): 2BG(+)—body ground (–)
- IGT4 (No.4): 2BH(+)—body ground (–)



am3uuw0000056

Oscilloscope setting

- 10 V/DIV (Y), 25 ms/DIV (X), DC range

Vehicle condition

- Idle after warm up (engine speed approx. 650 rpm, no load)

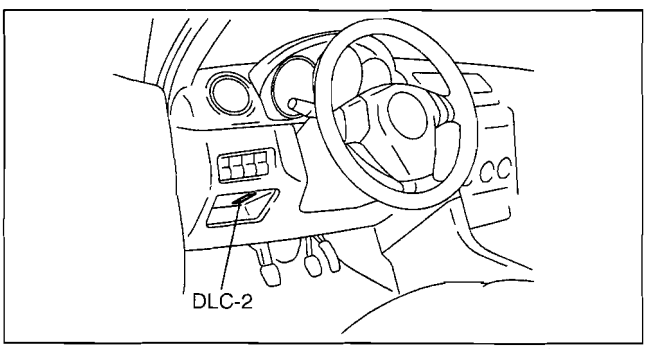
*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model
*3 : Except for California emission regulation applicable LF ATX model
*4 : except for California emission regulation applicable LF MTX, L3 model

Using SST (M-MDS)

Note

- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
  - — CMP sensor (See 01-40A-70 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3].)
  - — Main relay (See 09-21-3 RELAY INSPECTION.)

1. Connect the **SST** (M-MDS) to the DLC-2.
2. Turn the ignition switch to ON position.
3. Measure the PID value.
   - If PID value is not within the specification, follow the instructions in Action column.



am3uuw0000057

Note

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
  - — ACCS, ALTF, ARPMDES, EVAPCP, FAN_DUTY, FP, FUELPW1, GENVDSD, HTR11, HTR12, HTR13*1, IMRC, IMTV, INJ_1, INJ_2, INJ_3, INJ_4, LPS*2, SEGRP, SOL 12S*2, SOL 23S*2, SSA/SS1*2, SSB/SS2*2, SSC/SS3*2, test, VT DUTY1 Wt

*1 California emission regulation applicable model
*2 LF ATX

PID/DATA monitor table (reference)

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
AAT (Ambient air temperature)	°C °F	Ignition switch at ON position: Indicate the ambient air temperature	• IAT sensor	—
AC_REQ (Refrigerant pressure switch (high, low)l)	On/Off	Refrigerant pressure is more than the specification or less than the specification. (Refrigerant pressure switch (high, low) is off.): Off Except above: On	• Refrigerant pressure switch (high, low)	1AU*8 1AP*9
ACCS (A/C relay)	On/Off	Ignition switch ON: Off A/C switch ON and fan switch ON at idle: On	• Following PIDs: RPM, TP, ECT, TR • A/C relay	1I*8 1AN*9
AFR (Air fuel ratio)	—	Ignition switch at ON position: Indicate the air fuel ratio*4	• Following PIDs: O2S11, O2S12, O2S13*1 • Fuel injector	—
AFR_ACT (Actual air fuel ratio)	—	Ignition switch at ON position: Indicate the actual air fuel ratio	• Following PIDs: O2S11, O2S12, O2S13*1 • Fuel injector	—
ALTF (Generator field coil control duty value)	%	Ignition switch ON: 0% Idle: 0—100% Just after A/C switch ON and fan switch ON at idle: Duty value rises	• Following PIDs: IAT, ECT, RPM, VPWR, ALTT V • Generator	2AI*8 2AQ*9
ALTT V (Generator output voltage)	V	Ignition switch ON: 0 V Idle: Approx. 14.9 V (E/L not operating)	• Generator	2AJ*8 2AM*9
APP (Accelerator pedal position)	%	APP released: 0% APP open: 100%	• Following PIDs: APP1, APP2 • APP sensor	1AC*1 1AP*1 1Y*9 1AL*9 1AO*10 1AP*10
APP1 (APP sensor 1)	%	APP released: 31.0—32.4% APP open: 69.8—81.8%	• APP sensor	1AP*8 1Y*9
	V	APP released: 1.55—1.62 V APP depressed: 3.49—4.09 V		
APP2 (APP sensor 2)	%	APP released: 20.2—21.4% APP depressed: 58.8—70.8%	• APP sensor	1AC*1 1AL*9 1AO*10
	V	APP released: 1.01—1.07 V APP depressed: 2.94—3.54 V		
ARPMDES (Target engine speed)	RPM	No load: 700 rpm E/L operating: 700 rpm P/S operating: 700 rpm A/C ON: 750 rpm	• Following PIDs: IAT, RPM, MAP, ECT, MAF, TP, INGEAR, TR, PSP, ALTT V • IAC valve • CKP sensor	—
BARO (Barometric pressure)	Pa	Ignition switch ON: Indicate the atmospheric pressure	• BARO sensor	—
	V	Ignition switch ON (at sea level): Approx. 4.0 V		
BOO (Brake switch)	On/Off	Brake pedal depressed: On Brake pedal released: Off	• Brake switch	1AB*8 1AU*9
BPA (Brake pressure applied switch)	On/Off	Brake pedal depressed: On Brake pedal released: Off	• Brake switch	—
CATT11_DSD (Desired catalyst temperature bank one, sensor one)	°C	Indicate the estimated catalytic converter temperature	• Perform applicable DTC troubleshooting.	—
CHRGLP (Generator warning light)	On/Off	Ignition switch ON: On Idle: Off	• Perform applicable DTC troubleshooting.	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
COLP (Refrigerant pressure switch (middle))	ON/OFF	Refrigerant pressure switch (middle) ON *5 at idle: ON Refrigerant pressure switch (middle) OFF*6 at idle: OFF	• Refrigerant pressure switch	1J*8 1R*9
CPP*3 (Clutch pedal position)	On/Off	Clutch pedal depressed: On Clutch pedal released: Off	• CPP switch	1D
CPP/PNP*3 (Shift lever position)	Drive/ Neutral	Neutral position: Neutral Others: Drive	• Neutral switch	1X
DTCCNT (Number of DTC detected)	—	—	• Perform applicable DTC troubleshooting.	—
DWN SW*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
ECT (Engine coolant temperature)	°C / °F	ECT 20 °C {68 °F}: 20 °C {68 °F} ECT 60 °C {140 °F}: 60 °C {140 °F}	• ECT sensor	2AH*8 2AK*9
	V	ECT 20 °C {68 °F}: 3.04—3.14 V ECT 60 °C {140 °F}: 1.29—1.39 V		
EQ_RAT11 (Equivalence ratio (lambda))	—	Idling after warm-up: Approx. 1	• Perform applicable DTC troubleshooting.	2Z*1,*7 2AC*7 2AD*1,*7
EQ_RAT11_DSD (Desired equivalence ratio (lambda))	—	Idling after warm-up: Approx. 1	• Perform applicable DTC troubleshooting.	2Z*1,*7 2AC*7 2AD*1,*7
ETC_ACT (Electronic throttle control actual)	°	Indicate the desired TP by angle	• Perform applicable DTC troubleshooting.	2AL*8 2AK*8 2I*9 2M*9
ETC_DSD (Electronic throttle control desired)	%	Indicate the desired TP by percent	• Following PIDs:APP1, APP2, ETC_ACT. • TP sensor	—
	°	Indicate the desired TP by angle		
EVAPCP (Purge solenoid valve duty value)	%	Ignition switch ON: 0% Idle: 0%	• Following PIDs: IAT, RPM, ECT, MAF, O2S11, INGEAR, TR, VPWR.	2C*8 2AN*9
FAN_DUTY (Cooling fan control)	%	ECT 108 C {226 F} or more: 90% ECT less than 100 °C {212 °F}: 0%	• Following PIDs: RPM, TP, ECT, COLP, TEST. • Fan control module	1Y*1 1W*9 1R*10
FLI (Fuel level)	%	Fuel gauge level F: Approx. 100% Fuel gauge level E: Approx. 0%	• Perform applicable DTC troubleshooting.	—
FP (Fuel pump relay)	On/Off	Ignition switch ON: Off Idle: On Cranking: On	• Following PIDs: RPM • Fuel pump relay	1H*8 1AR*9
FUELPW (Fuel injector duration)	sec	Ignition switch ON: 0 ms Idle (after warm up): approx. 2.5 ms	• Following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, TR, PSP, VPWR, ALTT V • Fuel injector	2AZ 2BB 2BC 2BD
FUELSYS (Fuel system status)	OL/CL/OL-Drive/OL-Fault/CL-Fault	Ignition switch ON: OL Idle (after warm up): CL	• Following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, TR, PSP, VPWR, ALTT V • Fuel injector	—
GEAR*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
GENVDSD (Generator voltage desired)	V	Ignition switch ON: 0 V Idle: Approx. 14.9 V (E/L not operating)	• Perform applicable DTC troubleshooting	—
HTM_CNT*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
HTM_DIS*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
HTR11 (HO2S heater (front))	On/Off	Idle (after warm up): On⇔Off	• Following PIDs: IAT, MAF, TP, ECT, RPM	2BG*8 2G*9
HTR12 (HO2S heater (middle*1, rear*7))	On/Off	Ignition switch ON: Off (HO2S heater not operating) Idle: On (HO2S heater operating)	• Following PIDs: IAT, MAF, ECT, RPM	2BF*1 2C*9 2BE*10
HTR13*1 (HO2S heater (rear))	On/Off	Ignition switch ON: Off (HO2S heater not operating) Idle: On (HO2S heater operating)	• Following PIDs: IAT, MAF, ECT, RPM	2BE
IAT (Intake air temperature)	°C °F	Indicate the IAT.	• IAT sensor	1AT*8 1AH*9
	V	IAT 0 °C {32 °F}: Approx. 3.43 V IAT 20 °C {68 °F}: Approx. 2.38 V IAT 40 °C {104 °F}: Approx. 1.49 V		
IMRC (Variable tumble solenoid valve)	On/Off	Engine speed is less than approx. 3,750 rpm: On Others: Off	• Following PIDs: TP, ECT, RPM • Variable tumble solenoid valve	2I*8 2AI*9
IMTV (Variable Intake air control solenoid valve)	On/Off	Engine speed is less than approx. 4,500 rpm: On Others: Off	• Following PIDs: RP • Variable intake air solenoid valve	2J*8 2AJ*9
INGEAR (Load/no load condition)	On/Off	**MTX** CPP or CPP/PNP is ON: Off Others: On **ATX** P, N position: Off Others: On	• Perform applicable DTC troubleshooting.	1D*3 1X*3 1S*9 1AH*11
IVS (CTP condition)	Idle/Off Idle	CTP: Idle Others: Off Idle	• Perform applicable DTC troubleshooting.	—
KNOCKR (Knocking retard)	°	Ignition switch ON: 0° Idle: 0°	• Knock sensor	2U*8 2V*8 2Q*9 2R*9
LDP_EVAPCP (EVAP system leak detection pump detect incorrect purge flow)	A	Indicate the EVAP control system incorrect purge flow detection value	• Perform applicable DTC troubleshooting.	—
LDP_IDL (EVAP system leak detection pump idle current)	A	Indicate the EVAP system leak detection pump idle current	• Perform applicable DTC troubleshooting.	—
LDP_MON (EVAP system leak detection pump monitoring current)	A	Indicate the EVAP system leak detection pump monitoring current	• Perform applicable DTC troubleshooting.	—
LDP_REF (EVAP system leak detection pump reference current)	A	Indicate the EVAP system leak detection pump reference current	• Perform applicable DTC troubleshooting.	—
LDP_SLDV (EVAP system small leak detection value)	A	Indicate the EVAP control system small leak detection value	• Perform applicable DTC troubleshooting.	—
LDP_VSL_FV*1 (EVAP system small leak detection value)	mA/sec	Indicate the EVAP control system vary small leak-fail value	• Perform applicable DTC troubleshooting.	—
LDP_VSL_SV*1 (EVAP system small leak detection value)	mA/sec	Indicate the EVAP control system vary small leak-safe value	• Perform applicable DTC troubleshooting.	—
LDP_VSLDV*1 (EVAP system small leak detection value)	mA/sec	Indicate the EVAP control system vary small leak detection value	• Perform applicable DTC troubleshooting.	—
LINEDES*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
LOAD (Engine load)	%	Ignition switch ON: 0% Idle (after warm up): approx.19%	• MAF sensor	—
LONGFT1 (long term fuel trim)	%	Idle (after warm up): approx. –14—14%	• Perform applicable DTC troubleshooting	—
LPS*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
MAF (Mass airflow)	g/sec	Ignition switch ON: approx. 0 g/s Idle (after warm up): approx. 1.5 g/s	• MAF sensor	1AK*8 1AC*9
	V	Ignition switch ON: approx. 0.7 V Idle (after warm up): approx. 1.3 V		
MAP (Manifold absolute pressure)	Pa	Ignition switch ON (at sea level): approx. 101 kPa {29.8 inHg}	• MAP sensor	2AG*8 2AL*9
	V	Ignition switch ON (at sea level): approx. 4.1 V		
MIL (Malfunction indicator lamp)	On/Off	Ignition switch ON: On Idle: Off	• Perform applicable DTC troubleshooting.	—
MIL_DIS (Travelled distance since the MIL illuminated)	km, mile	No DTC: 0 km {0 mile} DTC detected: Not 0 km {0 mile}	• Perform applicable DTC troubleshooting.	—
MNL SW*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
O2S11 (Front oxygen sensor)	A	Idle (After warm up): approx. 0 mA	• HO2S (front).	2Z*1,*7 2AC*7 2AD*1,*7
O2S12 (Middle*2, rear*7 oxygen sensor)	V	Idle (After warm up): approx. 0.6 V	• HO2S (Middle*1, rear*7).	2R*1 2AH*9 2Q*10
O2S13*1 (Rear oxygen sensor)	V	Idle (After warm up): approx. 0.6 V	• HO2S (Rear).	2Q
OSS*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
RFCFLAG (Readness function code)	Not Learnt/ Learnt	Before running PCM adaptive memory procedure drive mode: Not Learnt After running PCM adaptive memory procedure drive mode: Learnt	• Run PCM adaptive memory procedure drive mode	—
RO2FT1 (rear oxygen sensor fuel trim)	—	Idle (after warm up): approx. –0.03—0.03	• Perform applicable DTC troubleshooting.	—
RPM (Engine speed)	RPM	Indicate the engine speed	• CKP sensoR	2W*8 2U*9
SCCS (Speed control command switch)	V	Press ON/OFF: Approx. 0 V Press CANCEL: Approx. 1.2 V Press SET/COAST: Approx. 3.2 V Press RES/ACCEL: Approx. 4.2 V Others: Approx. 5.0 V	• Cruise control switch	—
SEGRP (EGR valve (stepping motor) position)	—	Ignition switch ON: 0 step Idle: 0 step Cranking: 0—60 steps	• Following PIDs: MAF, TP, ECT, RPM, VSS • EGR valve	2G*8 2H*8 2K*8 2L*8 2AR*9 2AU*9 2AV*9 2AY*9

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
SEGRP DSD (Desired SEGRP valve position)	%	Idle: 0%	• Following PIDs: MAF, TP, ECT, RPM, VSS	2G*8 2H*8 2K*8 2L*8 2AR*9 2AU*9 2AV*9 2AY*9
SHRTFT1 (Short term fuel trim)	%	Idle (after warm up): approx.–30—25%	• Perform applicable DTC troubleshooting.	—
SHRTFT12 (Short term fuel trim bank 1 sensor 2)	%	Idle (after warm up): Approx.–30—25%	• Perform applicable DTC troubleshooting	—
SHRTFT13*1 (Short term fuel trim bank 1 sensor 3)	%	Idle (after warm up): Approx.–30—25%	• Perform applicable DTC troubleshooting	—
SOL 12S*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
SOL 23S*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
SPARKADV (Ignition timing)	°	Ignition switch ON: BTDC 0° Idle: BTDC approx. 10°	• Following PIDs: MAF, TP, ECT, RPM, INGEAR, TR, PSP, VPWR • Ignition timing	2AT*8 2AW*8 2AX*8 2BA*8 2BE*9 2BF*9 2BG*9 2BH*9
SSA/SS1*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
SSB/SS2*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
SSC/SS3*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
test (Test mode)	On/Off	—	—	—
TFT*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
TFTV*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
THOP*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
TIRESIZE (Tire Size (rev / mile))	rev/mile	Indicate the tire circumference length	—	—
TP REL (Relative throttle position)	%	APP released: Approx. 10% APP depressed: Approx. 93%	• TP sensor	—
TP1 (TP)	%	APP released: 8—12% APP depressed: 88—94%	• TP sensor	2AK*8 2M*9
	V	APP released: 0.4—0.6 V APP depressed: 4.4—4.7 V		
TP2 (TP)	%	APP released: 88—92% APP depressed: 6—12%	• TP sensor	2AL*8 2I*9
	V	APP released: 4.4—4.6 V APP depressed: 0.3—0.6 V		
TPCT (TP sensor voltage at CTP)	V	Approx. 0.5 V	• TP sensor	2AK*8 2AL*8 2M*9 2I*9
TR*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
TR_SENS*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
TSS*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			

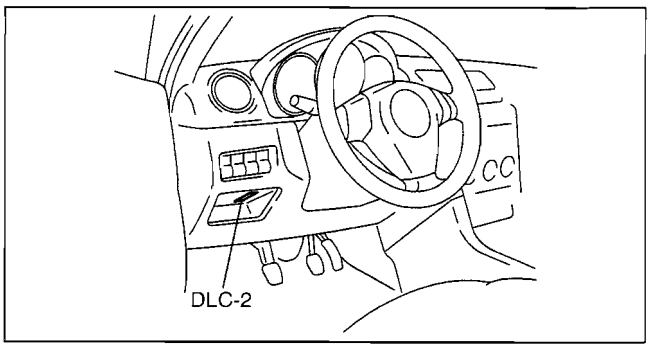
Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item(s)	PCM terminal
UP SW*2	(See 05-02A-81 PID/DATA MONITOR INSPECTION[FN4A-EL].)			
VPWR (Module supply voltage)	V	Indicate the Module supply voltage.	• Battery	—
Vref*7 (Battery voltage)	V	Indicate the Module supply voltage.	• Battery	—
VSS (Vehicle speed)	KPH, MPH	Vehicle speed 20 kph {12 mph}: 20 kph {12 mph} Vehicle speed 40 kph {25 mph}: 20 kph {12 mph}	• Perform applicable DTC troubleshooting	—
VT ACT1 (Actual valve timing)	°	Idle: Approx. 0°	• Following PIDs: TP, ECT, RPM • OCV	2E*8 2AF*9
VT DIFF1 (Difference between target and actual valve timing)	°	Idle: Approx. 0°	• Following PIDs: TP, ECT, RPM • OCV	2E*8 2AF*9
VT DUTY1 (Oil control valve duty value)	%	Idle: Approx. 11.5%	• Following PIDs: TP, ECT, RPM • OCV	2E*8 2AF*9
VTC (Variable tumble shutter valve control)	On/Off	Indicate the condition of the variable tumble shutter valve switch	• Following PIDs: IMRC • Variable tumble shutter valve switch	2AE

*1 : California emission regulation applicable model
*2 : LF ATX
*3 : MTX
*4 : Calculated value; differs from terminal voltage
*5 : Refrigerant pressure switch (middle) turns off when the refrigerant pressure is 1.26—1.49 MPa {12.9—15.1 kgf/cm6, 184—214 psi}
*6 : Refrigerant pressure switch (middle) turns on when the refrigerant pressure is 1.69—1.84 MPa {17.3—18.7 kgf/cm^2, 247—265 psi}
*7 : Except for California emission regulation applicable model
*8 : LF MTX, L3, and California emission regulation applicable model with LF ATX
*9 : Except for California emission regulation applicable model with LF ATX
*10: Except for California emission regulation applicable model with LF MTX, L3
*11: California emission regulation applicable model with LF ATX

PCM CONFIGURATION[LF, L3]

1. Connect the M-MDS to DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module Programming".
3. Then, select the "Programmable Module installation" and "PCM" from the screen menu.
4. Select "Programmable Parameters". [with DSC HU/CM]
5. Select "Tire Size / Axle Ratio". [with DSC HU/CM]
6. Select "Body Type - (PCM)", then select the applicable body type on the M-MDS screen. [with DSC HU/CM]
7. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection.

id0140a6802600



am3zzw0000046

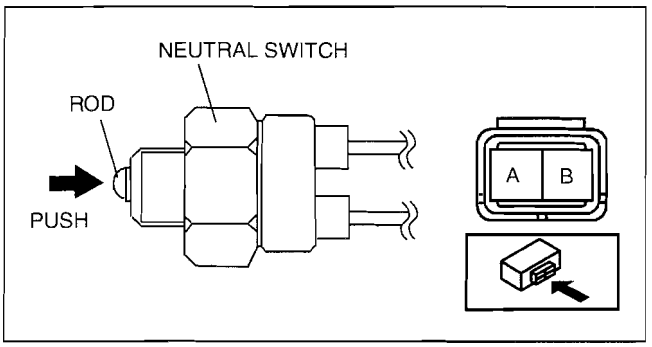
NEUTRAL SWITCH INSPECTION[LF, L3]

id0140a6800800

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Continuity Inspection

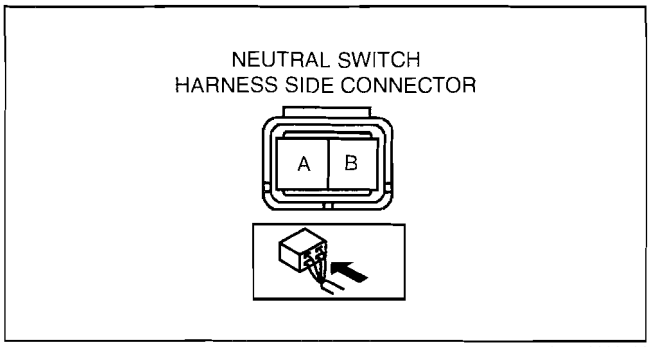
1. Remove the neutral switch. (See 05-15A-2 NEUTRAL SWITCH REMOVAL/INSTALLATION[G35M-R].)
2. Verify that the continuity between neutral switch terminals A and B is as indicated in the table.
   - If it can be verified, perform the "Circuit Open/ Short Inspection".
   - If it cannot be verified, replace the neutral switch.



am3uuw0000108

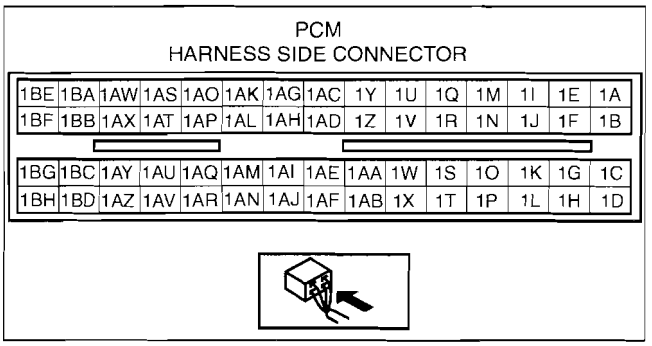
Measured condition	Continuity
Rod pushed	Continuity detected
Except above	No continuity

Circuit Open/Short Inspection



am3uuw0000108

1. Disconnect the PCM connector.
2. Inspect the following wiring harness for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - — Neutral switch terminal A and PCM terminal 1X
  - — Neutral switch terminal B and body ground

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - — Neutral switch terminal B and ground

CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[LF, L3]

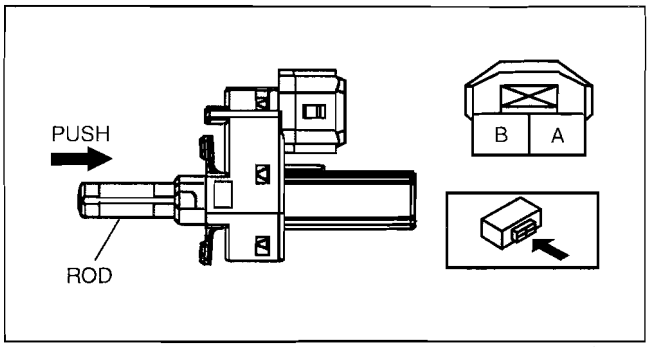
id0140a6801600

Note
- Before performing the following inspection, make sure to follow the troubleshooting flowchart. (See 01-03A-10 FOREWORD[LF, L3].)

Continuity Inspection

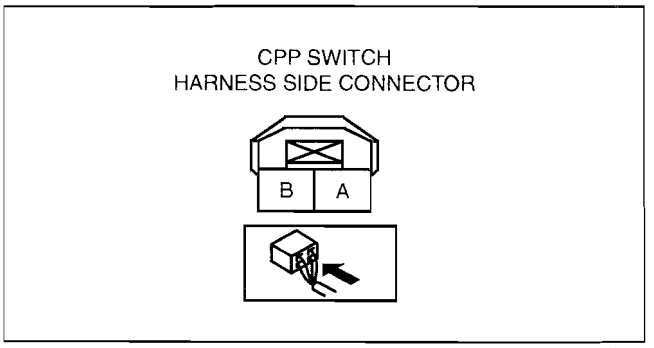
1. Remove the CPP switch.
2. Verify that the continuity between CPP switch terminals A and B is as indicated in the table.
   - If there is no malfunction, perform the "Circuit Open/Short Inspection".
   - If there is any malfunction, replace the CPP switch.

Measurement condition	Continuity
Push the rod.	No continuity
Except above	Continuity detected



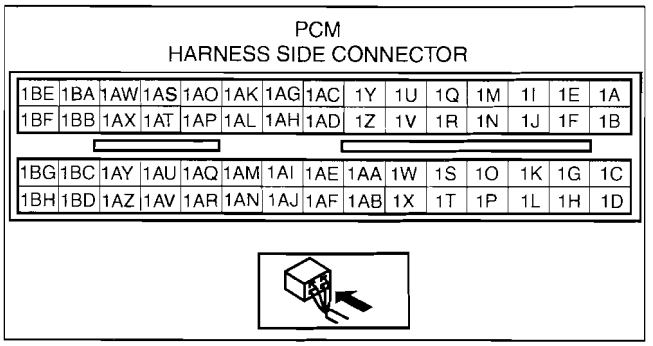
B3E0140W023

Circuit Open/Short Inspection



e3u140zw6204

1. Disconnect the PCM connector.
2. Disconnect the CPP switch connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - CPP switch terminal A and PCM terminal 1D
  - CPP switch terminal B and body ground

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - CPP switch terminal A and body ground
  - CPP switch terminal A and power supply
  - CPP switch terminal B and power supply

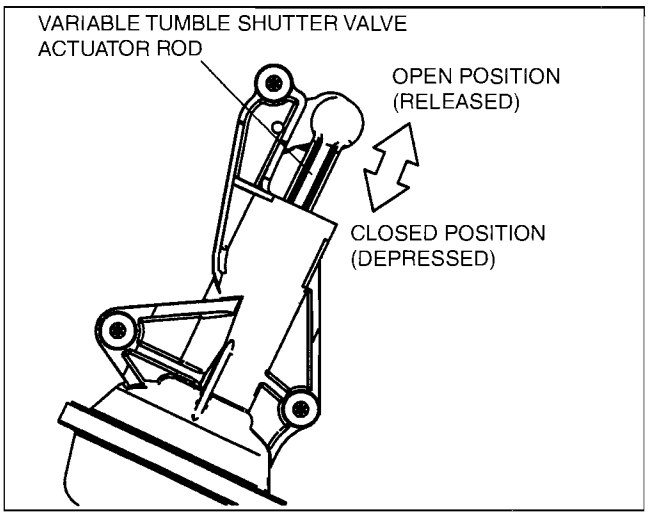
VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION[LF, L3]

id0140a6808200

Note
- Perform the following inspection only when directed.

Voltage Inspection

1. Turn the ignition switch to the ON position (Engine off).
2. Verify that the PCM terminal 2AE voltage is as shown in the following table when the variable tumble shutter valve actuator rod is depressed and released by hand.

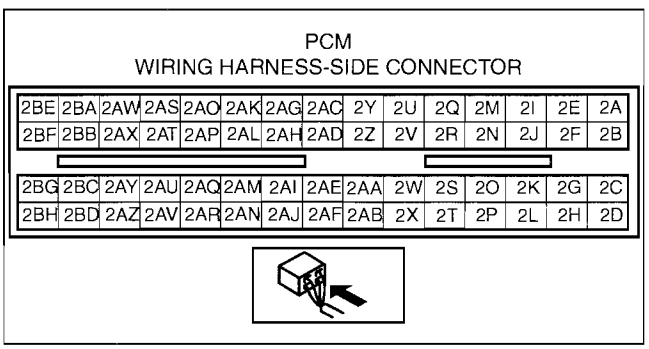


c3u0140w010

- If not as specified, perform the "Circuit Open/ Short Inspection".
  - — If there is no open or short circuit, replace the intake manifold.

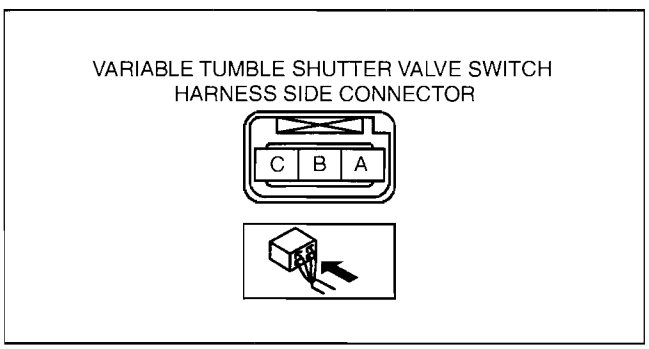
Variable tumble shutter valve switch output voltage

Condition	PCM terminal 2AE
Released (Open position)	Approx. 5.0 V
Depressed (Closed position)	Less than 0.4 V



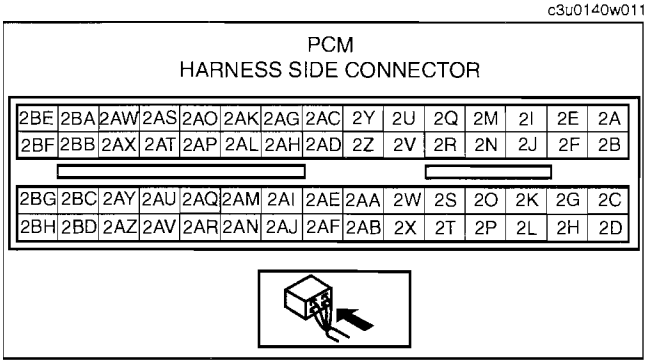
c3u0140w009

Circuit Open/Short Inspection



c3u0140w011

1. Disconnect the PCM connector.



E3U140ZW6992

2. Inspect the following harness for an open or short wiring. (Continuity inspection)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Variable tumble shutter valve switch terminal A and PCM terminal 2AU*1, 2AR*2, 2W*3
  - Variable tumble shutter valve switch terminal B and PCM terminal 2AY*1, 2P*2, 2AA*3
  - Variable tumble shutter valve switch terminal C and PCM terminal 2AE

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Variable tumble shutter valve switch terminal A and body ground
  - Variable tumble shutter valve switch terminal B and power supply
  - Variable tumble shutter valve switch terminal C and power supply
  - Variable tumble shutter valve switch terminal C and body ground

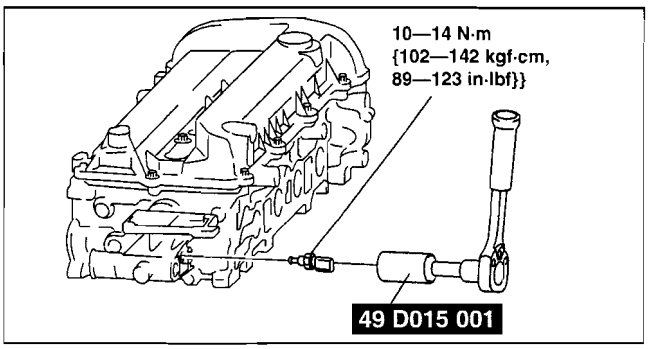
*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF MTX, L3
*3 : Except for California emission regulation applicable model with LF ATX

ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[LF, L3]

id0140a6801900

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the plug hole cover.
4. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
5. Disconnect the ECT sensor connector.
6. Remove the ECT sensor using the **SST**.
7. Install in the reverse order of removal.

Tightening torque
10—14 N·m {102—142 kgf·cm, 89—123 in·lbf}



c3u0140w051

ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[LF, L3]

id0140a6802000

Resistance Inspection

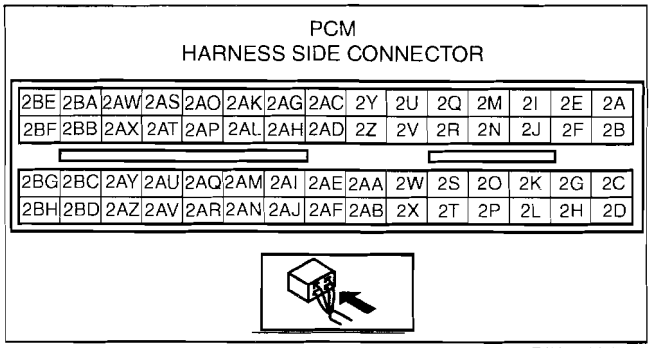
Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

1. Disconnect the ECT sensor connector.
2. Remove the ECT sensor. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[LF, L3].)
3. Place the ECT sensor in the water and while increasing the water temperature, measure the resistance between ECT sensor terminals A and B.
   - If the monitor item status/specification (reference) is not within the specification, even though the ECT sensor resistance is within the specification, perform the "Circuit Open/Short Inspection".
   - If not within the specification, replace the ECT sensor.

Standard

Water temperature (°C {°F})	Resistance (kilohm)
20 {68}	35.48—39.20
70 {158}	5.07—5.60
80 {176}	3.65—4.02

Circuit Open/Short Inspection



1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A and PCM terminal 2AH*1 *2, 2AK*3
  - — ECT sensor terminal B and PCM terminal 2AY*1, 2P*2, 2AA*3

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A and power supply
  - — ECT sensor terminal A and body ground
  - — ECT sensor terminal B and power supply

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF MTX, L3
*3 : Except for California emission regulation applicable model with LF ATX

MASS AIR FLOW (MAF) SENSOR INSPECTION[LF, L3]

id0140a6800700

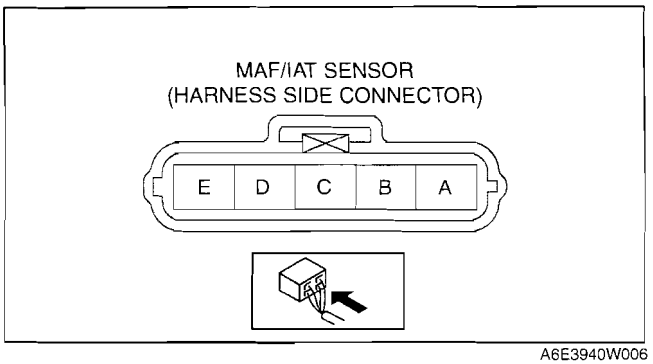
Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Visual Inspection
1. Visually inspect the MAF sensor for the following:
   - Damage, cracks
   - Rusted sensor terminal
   - Bent sensor terminal
     - — If there is any malfunction, replace the MAF sensor.
     - — If the monitor item status/specification (reference) is not within the specification even though there is no malfunction, perform the "Circuit Open/Short Inspection".

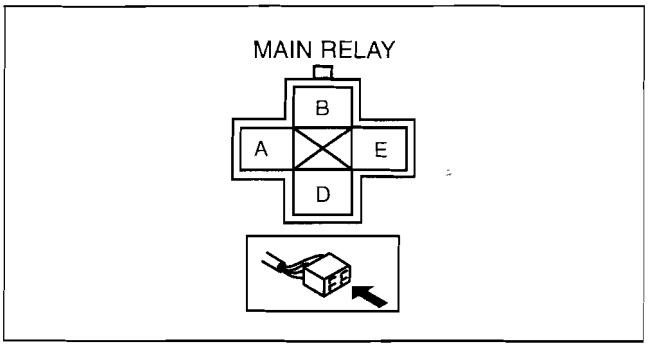
Voltage Inspection
1. Remove the MAF/IAT sensor without disconnect the MAF/IAT sensor connector.
2. Turn the ignition switch to the ON position.
3. As the air gradually approaches the MAF detection part of the MAF/IAT sensor, verify that the voltage at PCM terminal 1AK*1, 1AC*2 (M-MDS PID: MAF) varies.
   - If it cannot be verified even though the related harnesses have no malfunction, replace the MAF/IAT sensor. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3], 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3
*2 : Except for California emission regulation applicable model with LF ATX

Circuit Open/Short Inspection

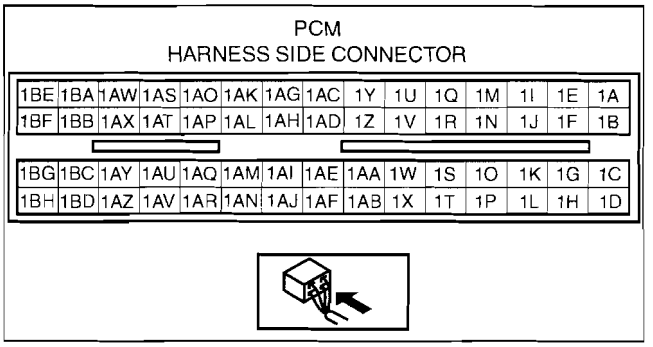


A6E3940W006



e3u140zw6993

1. Disconnect the PCM connector. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the MAF sensor connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF sensor terminal A and main relay terminal A
  - — MAF sensor terminal B and PCM terminal 1AR[*1], 1AE[*2]
  - — MAF sensor terminal C and PCM terminal 1AK[*1], 1AC[*2]

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF sensor terminal A and body ground
  - — MAF sensor terminal B and power supply
  - — MAF sensor terminal C and power supply
  - — MAF sensor terminal C and body ground

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

*2 : Except for California emission regulation applicable model with LF ATX

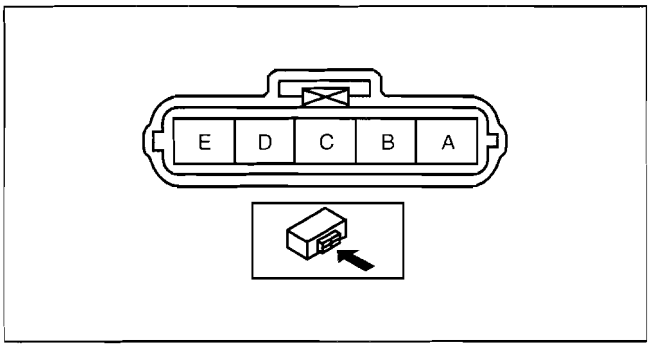
INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[LF, L3]

id0140a6802200

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Resistance Inspection

1. Disconnect the mass air flow sensor connector.
2. Verify that the resistance between MAF sensor terminals D and E is within the specification.
   - If the monitor item status/specification (reference) is not within the specification, even though the IAT sensor resistance is within the specification, perform the "Circuit Open/Short Inspection".
   - If not within the specification, replace the MAF sensor.

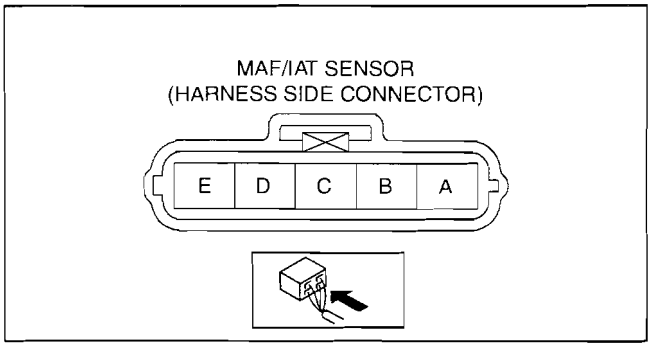


B3E0140W028

Standard

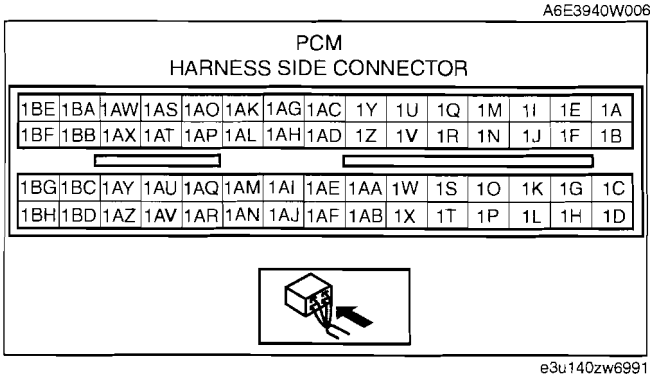
Ambient temperature (°C {°F})	Resistance (kilohm)
–20 {–4.0}	13.6—18.4
20 {68}	2.21—2.69
60 {140}	0.493—0.667

Circuit Open/Short Inspection



A6E3940W006

1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal D and PCM terminal 1AT[*1 *2], 1AH[*3]
  - — MAF/IAT sensor terminal E and PCM terminal 1AS[*1], 1AV[*2], 1AA[*3]

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal E and power supply
  - — MAF/IAT sensor terminal D and power supply
  - — MAF/IAT sensor terminal D and body ground

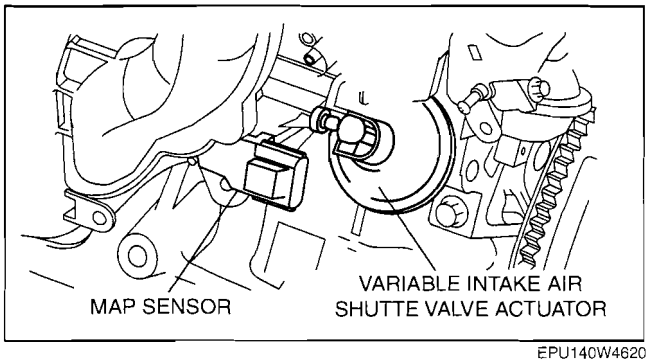
*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF MTX, L3
*3 : Except for California emission regulation applicable model with LF ATX

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION[LF, L3]

id0140a6804300

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the plug hole cover.
4. Remove the vacuum hose.
5. Disconnect the MAP sensor connector.
6. Remove the MAP sensor installation screw.
7. Remove MAP sensor from the intake manifold.
8. Install in the reverse order of removal.

Tightening torque
2.7—3.7 N·m {28—37 kgf·cm, 24—32 in·lbf}



EPU140W4620

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[LF, L3]

id0140a6800900

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Voltage Inspection

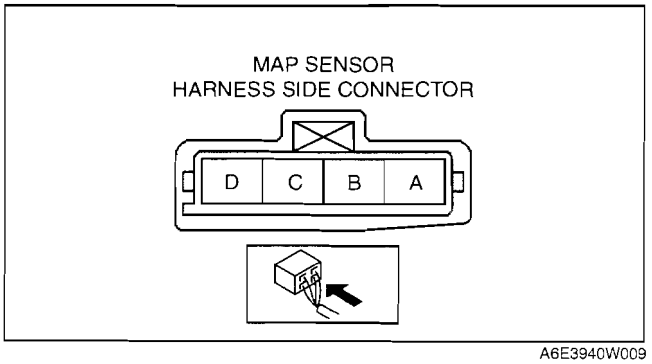
1. Remove the MAP sensor with the connector still connected. (See 01-40A-53 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION[LF, L3].)
2. Remove the vacuum hose of the MAP sensor.
3. Verify that the voltage at PCM terminal 2AL is within the specification when the ignition switch is turned to the ON position.
   - If not within the specification, replace the MAP sensor.

Voltage
2.69—4.37 V

4. Install the vacuum pump.
5. Turn the ignition switch to the ON position.
6. Verify that change in voltage is within the specification when a vacuum of **30 kPa {225 mmHg, 8.86 inHg}** is applied using a vacuum pump.
   - If not within the specification, replace the MAP sensor.

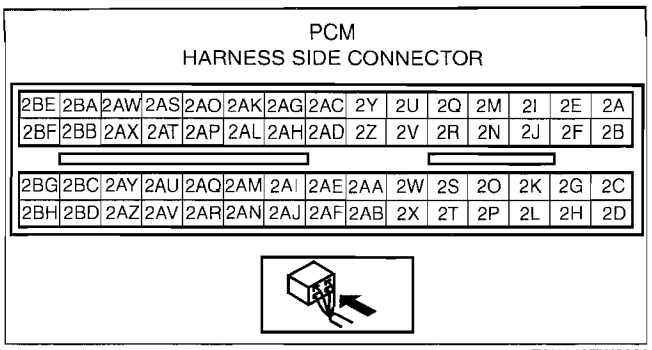
Voltage variance
1.16—1.27 V

Circuit Open/Short Inspection



A6E3940W009

1. Disconnect the PCM connector.
2. Inspect the following wiring harness for an open or short circuit. (Continuity inspection)



E3U140ZW6992

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAP sensor terminal A and PCM terminal 2AY*1, 2P*2, 2AA*3
  - — MAP sensor terminal C and PCM terminal 2AU*1, 2AR*2, 2W*3
  - — MAP sensor terminal D and PCM terminal 2AG*1, 2AG*2, 2AL*3

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAP sensor terminal A and power supply.
  - — MAP sensor terminal C and body ground.
  - — MAP sensor terminal D and power supply.
  - — MAP sensor terminal D and body ground

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF MTX, L3
*3 : Except for California emission regulation applicable model with LF ATX

THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3]

id0140a6802700

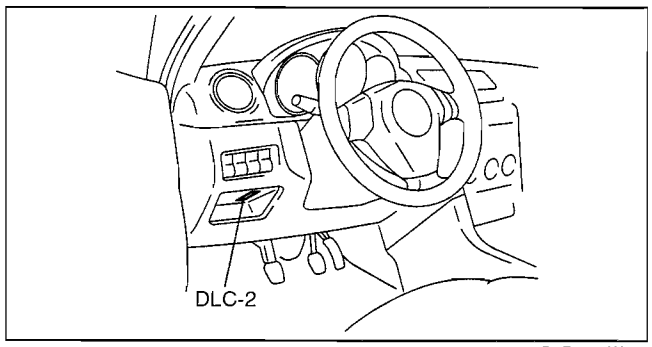
Caution

- **This inspection procedure cannot be completed correctly if the accelerator pedal position sensor has a malfunction. Before performing this procedure, verify that any one of the DTCs (P2122, P2123, P2127, P2128, P2138) related to the accelerator pedal position sensor is not detected.**

Note

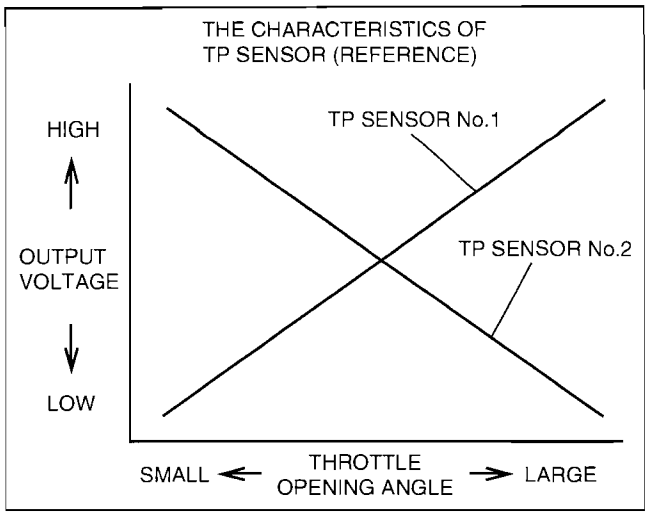
- Before performing the following inspection, make sure to follow the troubleshooting flowchart. (See 01-03A-10 FOREWORD[LF, L3].)

1. Verify that no DTC related to APP sensor has been detected.
   - If any DTCs related to APP sensor have been detected, perform the DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
2. Connect the M-MDS to the DLC-2.
3. Turn the ignition switch to ON position.
4. Select TP1 or TP2 PID (percentage) on the M-MDS.
5. Verify that the TP1 or TP2 PID is within the specification when the accelerator pedal not depressed. (See 01-40A-13 PCM INSPECTION[LF, L3].)



B3E0102W003

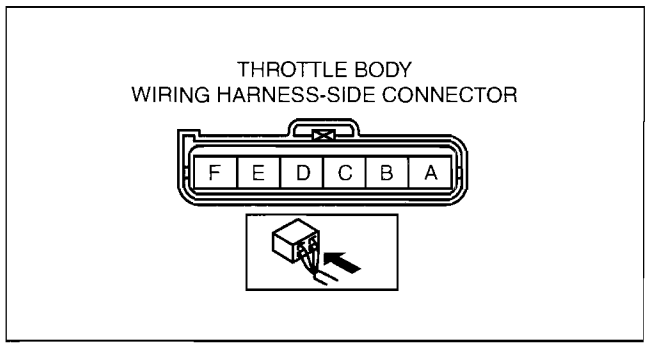
6. Operate the accelerator pedal and verify that the TP1 or TP2 PID (percentage) changes as shown in the following graph.
   - If not verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the throttle body. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3], 01-13A-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[LF, L3].)



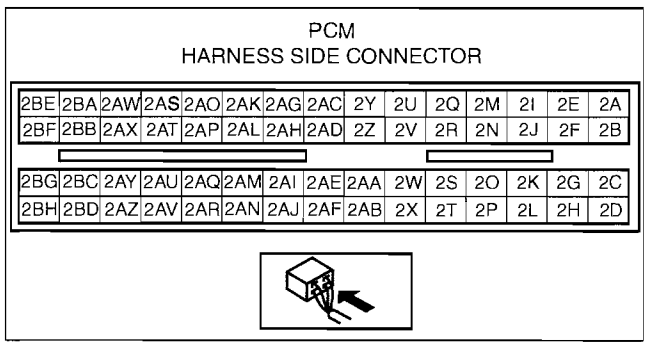
B6U0140W082

Circuit Open/Short Inspection

1. Disconnect the PCM connector.
2. Disconnect the throttle body connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6205



E3U140ZW6992

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  — Throttle body terminal A and PCM terminal 2AK*1, 2M*2
  — Throttle body terminal B and PCM terminal 2AO*1, 2K*2
  — Throttle body terminal C and PCM terminal 2AL*1, 2I*2
  — Throttle body terminal D and PCM terminal 2AP*1, 2O*2

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  — Throttle body terminal A and body ground
  — Throttle body terminal A and power supply
  — Throttle body terminal B and body ground
  — Throttle body terminal B and power supply
  — Throttle body terminal C and body ground
  — Throttle body terminal C and power supply
  — Throttle body terminal D and body ground
  — Throttle body terminal D and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

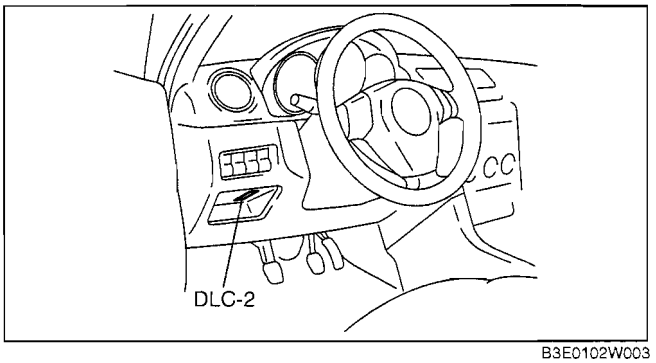
*2 : Except for California emission regulation applicable model with LF ATX

ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[LF, L3]

id0140a6803200

Note
- Before performing the following inspection, make sure to follow the troubleshooting flowchart. (See 01-03A-10 FOREWORD[LF, L3].)

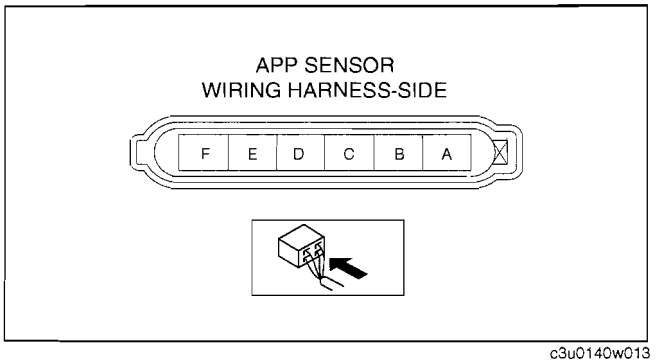
1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to ON position.
3. Select APP1 and APP2 PID on the M-MDS.
4. Verify that the APP1 and APP2 PID is within the specification when the accelerator pedal not depressed. (See 01-40A-13 PCM INSPECTION[LF, L3].)



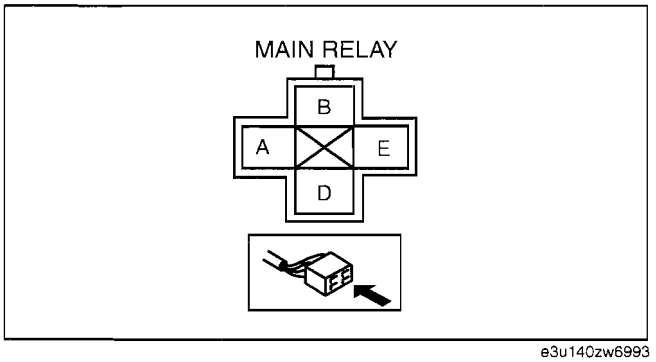
B3E0102W003

Circuit Open/Short Inspection

1. Disconnect the PCM connectors.
2. Disconnect the APP sensor connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

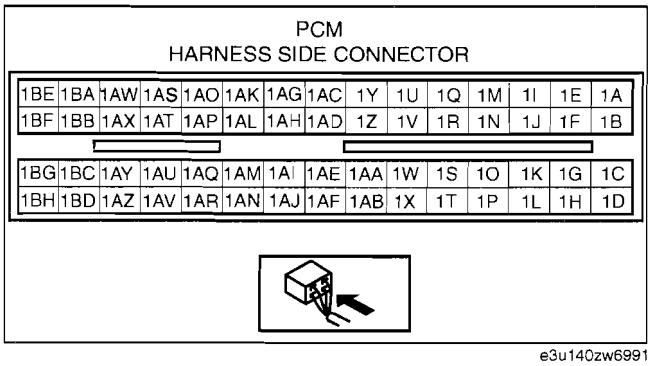


c3u0140w013



e3u140zw6993

Open circuit
- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - — APP sensor terminal A and PCM terminal 1AL*1 *2, 1AW*3
  - — APP sensor terminal B and PCM terminal 1AP *1 *2, 1Y*3
  - — APP sensor terminal C and PCM terminal 1AS*1, 1AV*2, 1AA*3
  - — APP sensor terminal D and PCM terminal body ground
  - — APP sensor terminal E and PCM terminal 1AC*1, 1AO*2, 1AL*3
  - — APP sensor terminal F and main relay terminal A



e3u140zw6991

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - APP sensor terminal A and body ground
  - APP sensor terminal B and body ground
  - APP sensor terminal B and power supply
  - APP sensor terminal C and power supply
  - APP sensor terminal D and power supply
  - APP sensor terminal E and body ground
  - APP sensor terminal E and power supply
  - APP sensor terminal F and power supply

*1 California emission regulation applicable model

*2 Except for California emission regulation applicable model with LF MTX, L3

*3 Except for California emission regulation applicable model with LF ATX

HEATED OXYGEN SENSOR (HO2S) INSPECTION[LF, L3]

id0140a6802300

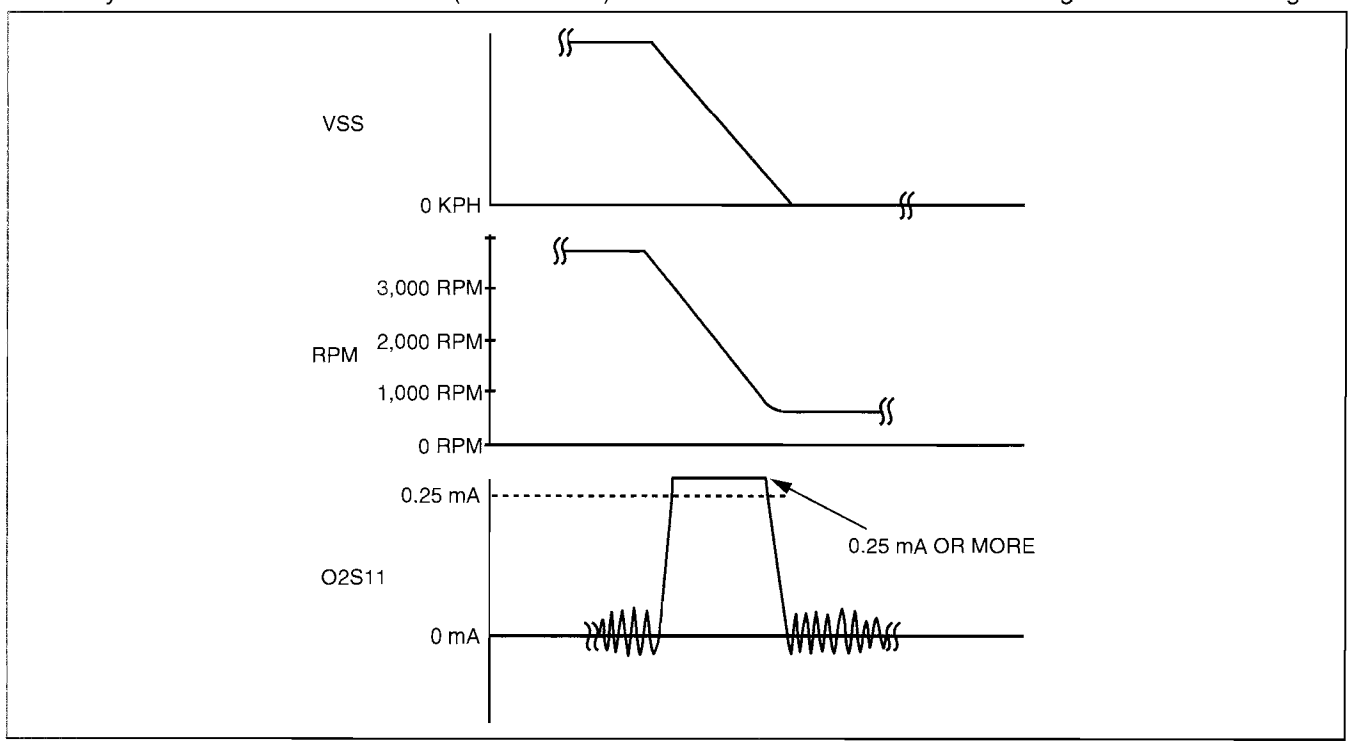
California Emission Regulation Applicable Model

Note

- Before performing the following inspection, make sure to follow the troubleshooting flowchart. (See 01-03A-10 FOREWORD[LF, L3].)

Front HO2S current inspection

1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   - Vehicle speed (PID: VSS)
   - Engine speed (PID: RPM)
   - Front HO2S current (PID: O2S11)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more**.
4. Verify that the front HO2S current (PID: O2S11) is **0.25 mA or more** while decelerating as shown in the figure.



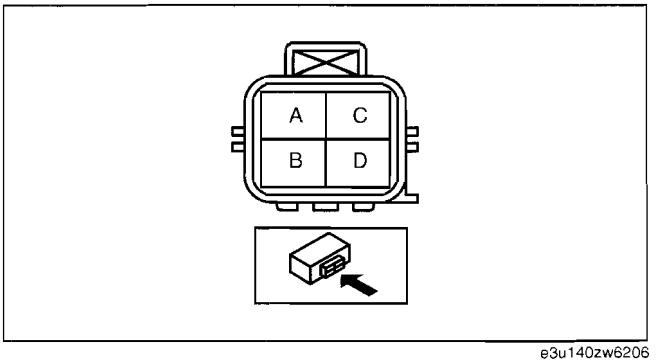
am3uuw0000100

- If not within the specification, inspect the HO2S for an open or short circuit. (See 01-40A-58 Front HO2S circuit open/short inspection (sensor).) Then if there is no malfunction in the wiring harness, replace the front HO2S.

Front HO2S heater resistance inspection

1. Disconnect the front HO2S connector.
2. Measure the resistance between front HO2S terminals C and D.
   - If not within the specification, replace the front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION[LF, L3].)

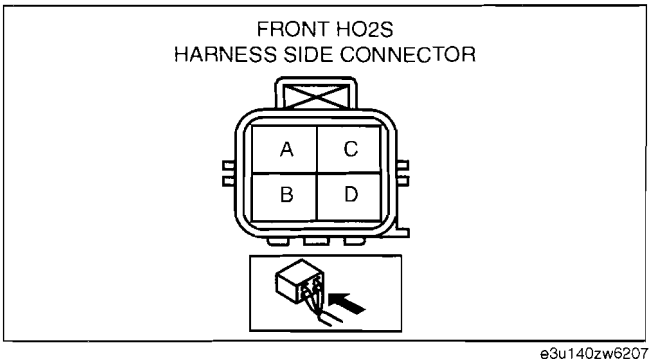
Front HO2S heater resistance
1—10 ohms [20 °C {68 °F}]



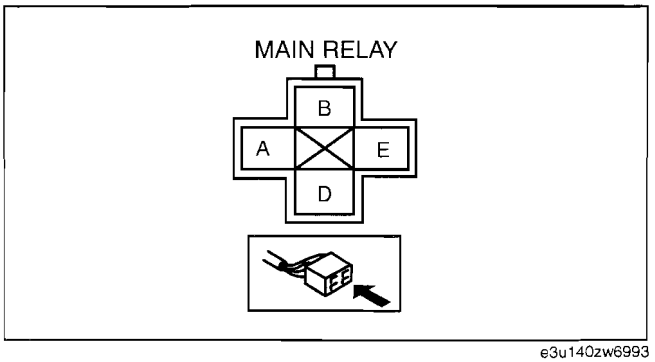
e3u140zw6206

Front HO2S circuit open/short inspection (sensor)

1. Disconnect the PCM connector.
2. Disconnect the front HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6207



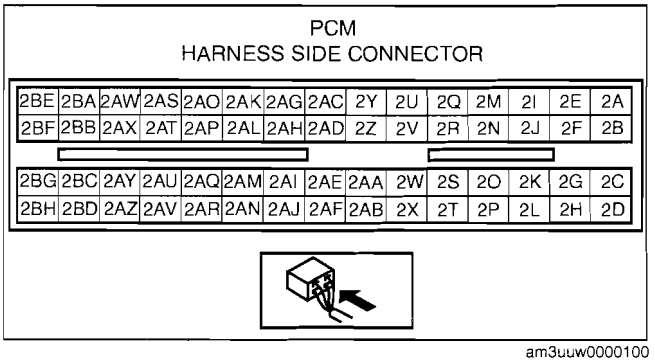
e3u140zw6993

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - Front HO2S terminal A and PCM terminal 2AD
  - Front HO2S terminal B and PCM terminal 2Z
  - Front HO2S terminal C and PCM terminal 2BG
  - Front HO2S terminal D and main relay terminal A

Short circuit

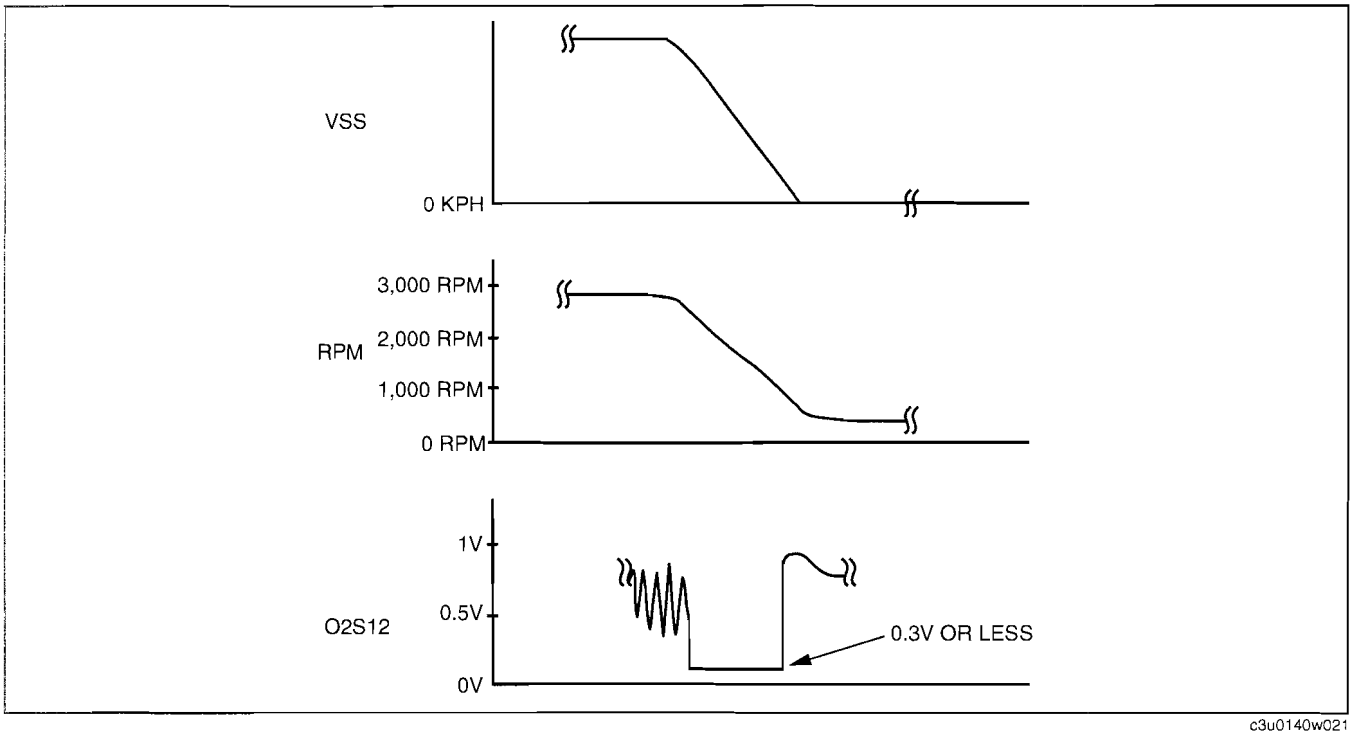
- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Front HO2S terminal A and body ground
  - Front HO2S terminal A and power supply
  - Front HO2S terminal B and body ground
  - Front HO2S terminal B and power supply
  - Front HO2S terminal C and body ground
  - Front HO2S terminal C and power supply
  - Front HO2S terminal D and body ground



am3uuw0000100

Middle/rear HO2S voltage inspection

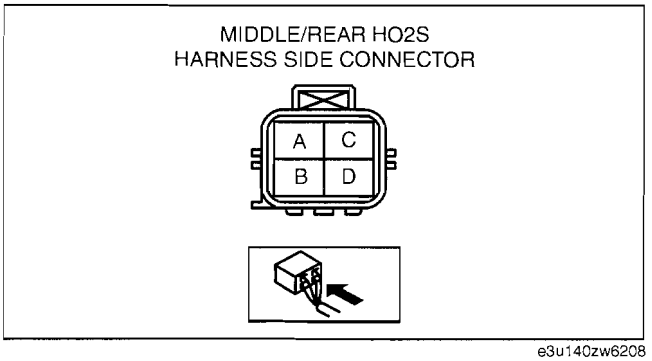
1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   — Vehicle speed (PID: VSS)
   — Engine speed (PID: RPM)
   — Middle/rear HO2S voltage (PID: O2S12/O2S13)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more**.
4. Verify that the middle/rear HO2S outputs a voltage of **0.6 V or more**, one time or more, then verify that the middle/rear HO2S voltage (PID: O2S12/O2S13) is **0.3 V or less** while decelerating as shown in the figure.



c3u0140w021

- If not within the specification, inspect the HO2S for an open or short circuit. (See 01-40A-59 Middle/rear HO2S circuit open/short inspection (sensor).) Then if there is no malfunction in the wiring harness, replace the middle/rear HO2S.

Middle/rear HO2S circuit open/short inspection (sensor)



e3u140zw6208

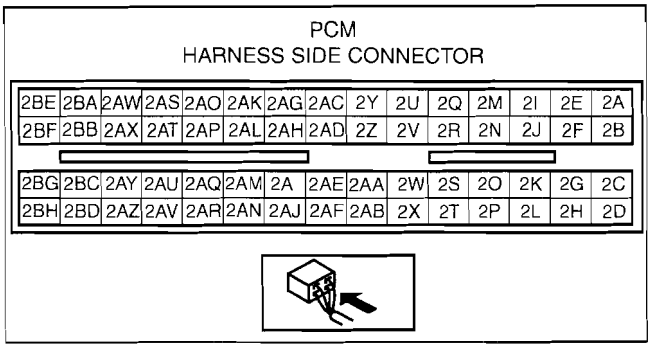
1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Middle HO2S terminal A and PCM terminal 2R
  - — Rear HO2S terminal A and PCM terminal 2Q
  - — Middle/rear HO2S terminal B and PCM terminal 2AY

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Middle/rear HO2S terminal A and body ground
  - — Middle/rear HO2S terminal A and power supply
  - — Middle/rear HO2S terminal B and power supply

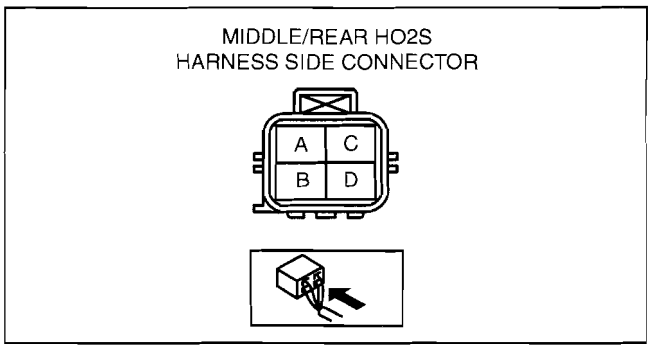


am3uuw0000100

Middle/rear HO2S heater resistance inspection

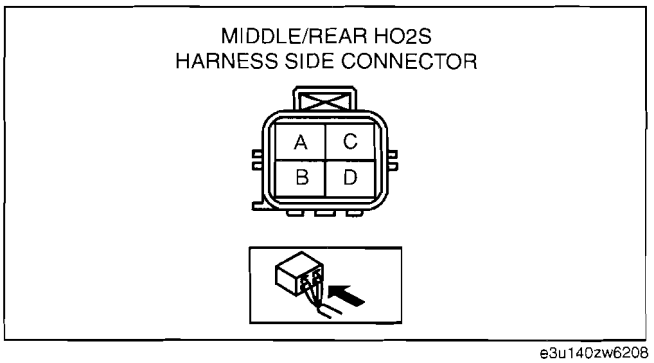
1. Disconnect the middle/rear HO2S connector.
2. Measure the middle/rear HO2S resistance between terminals C and D.
   - If not within the specification, replace the HO2S.

Middle/rear HO2S heater resistance
2—50 ohms

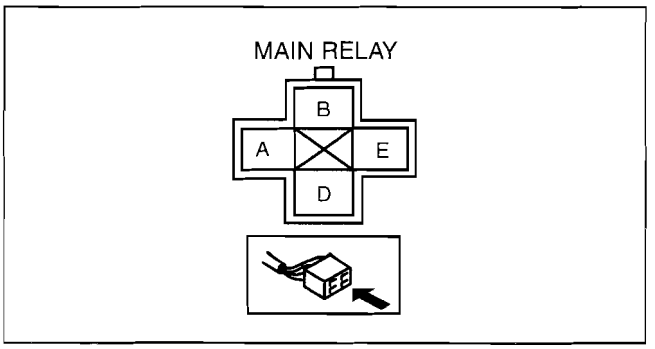


e3u140zw6208

Middle/rear HO2S circuit open/short inspection (heater)



e3u140zw6208



e3u140zw6993

1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Middle/rear HO2S terminal C and main relay A
  - — Middle HO2S terminal D and PCM terminal 2BF
  - — Rear HO2S terminal D and PCM terminal 2BE

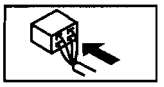
Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the wiring harness.

  Middle and rear
  - — Middle/rear HO2S terminal C and body ground
  - — Middle/rear HO2S terminal D and power supply
  - — Middle/rear HO2S terminal D and body ground

PCM
HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



am3uuw0000100

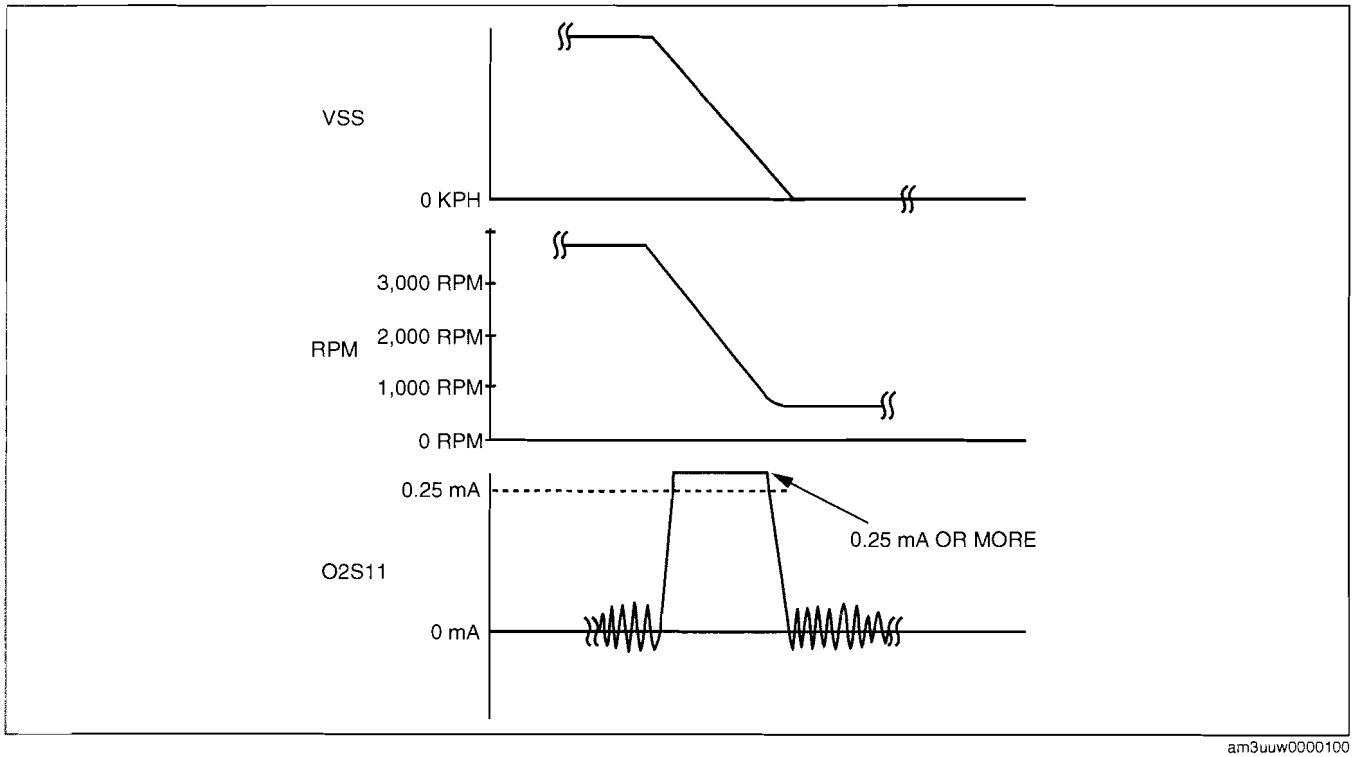
Except for California Emission Regulation Applicable Model

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Front HO2S current inspection

1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   - — Vehicle speed (PID: VSS)
   - — Engine speed (PID: RPM)
   - — Front HO2S current (PID: O2S11)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more**.
4. Verify that the front HO2S current (PID: O2S11) is **0.25 mA or more** while decelerating as shown in the figure.



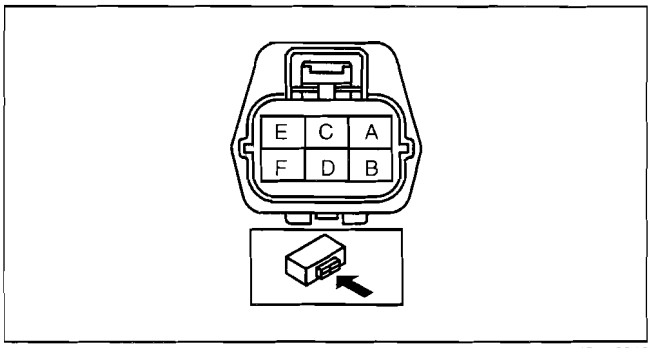
am3uuw0000100

- If not within the specification, inspect the HO2S for an open or short circuit. (See 01-40A-58 Front HO2S circuit open/short inspection (sensor).) Then if there is no malfunction in the wiring harness, replace the front HO2S.

Front HO2S heater resistance inspection

1. Disconnect the front HO2S connector.
2. Measure the resistance between front HO2S terminals C and D.
   - If not within the specification, replace the front HO2S. (See 01-40A-66 HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION[LF, L3].)

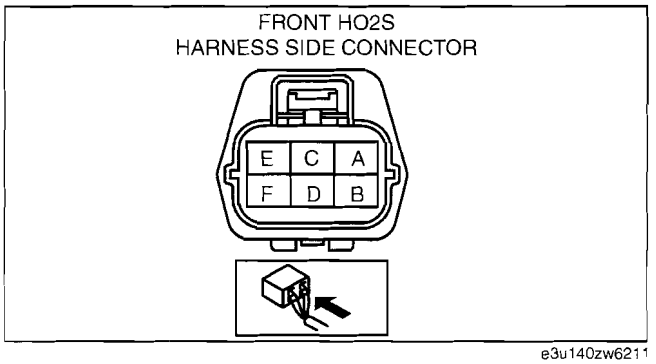
Front HO2S heater resistance
1—10 ohms [20 °C {68 °F}]



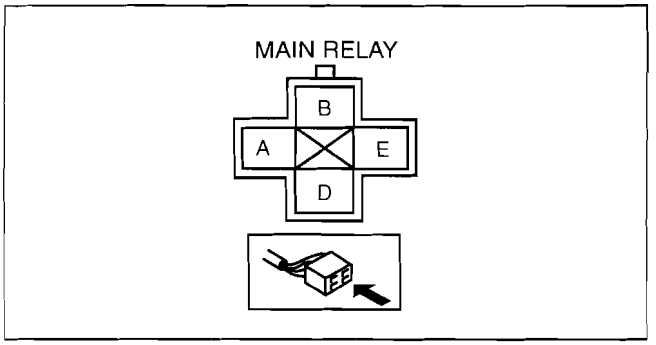
e3u140zw6212

Front HO2S circuit open/short inspection (sensor)

1. Disconnect the PCM connector.
2. Disconnect the front HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



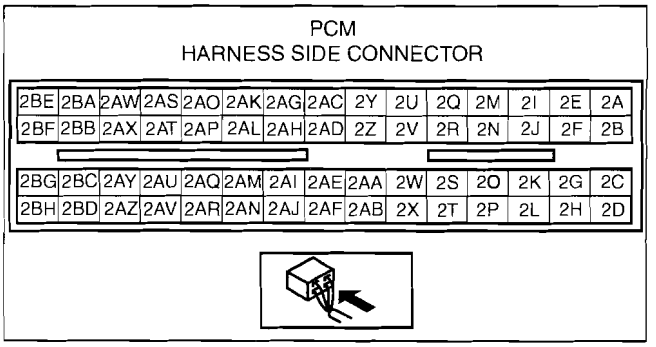
e3u140zw6211



e3u140zw6993

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - — Front HO2S terminal A and main relay terminal A
  - — Front HO2S terminal B and PCM terminal 2AD
  - — Front HO2S terminal D and PCM terminal 2AC
  - — Front HO2S terminal E and PCM terminal 2BG*1, 2G*2
  - — Front HO2S terminal F and PCM terminal 2Z



am3uuw0000100

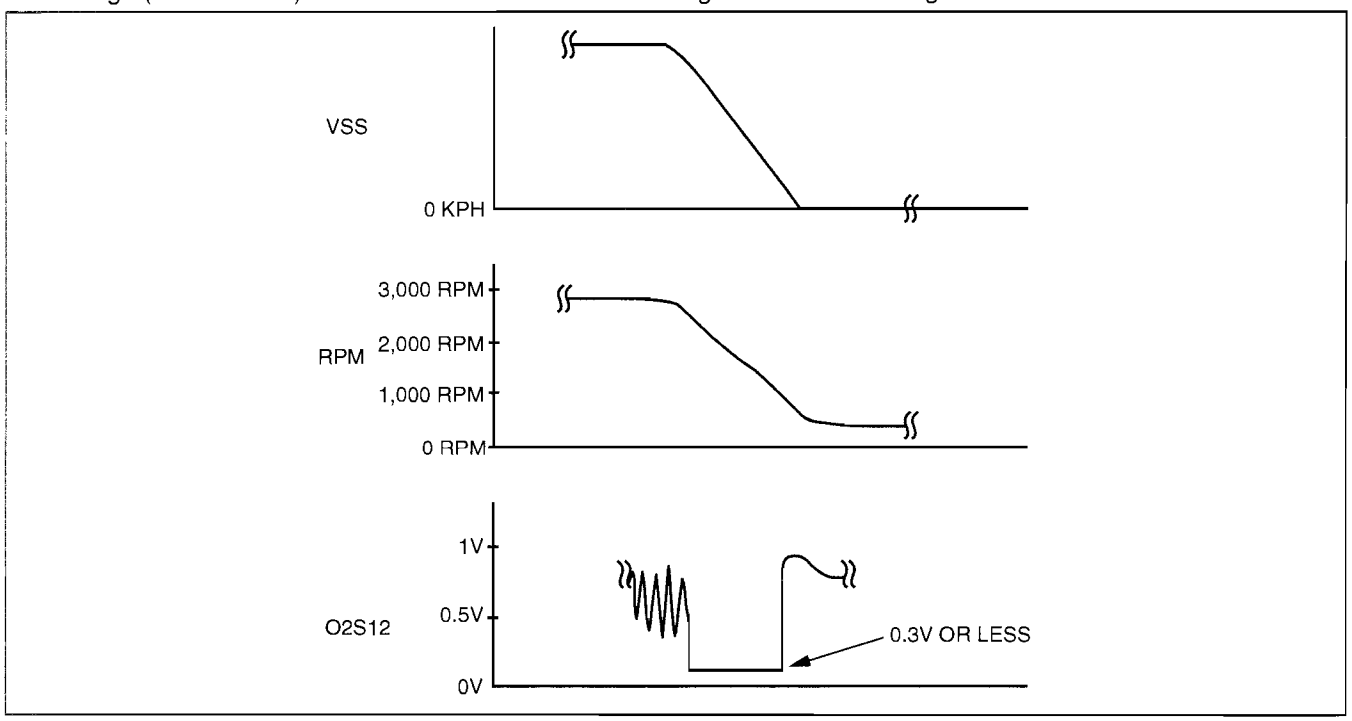
Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - — Front HO2S terminal A and body ground
  - — Front HO2S terminal B and body ground
  - — Front HO2S terminal B and power supply
  - — Front HO2S terminal D and body ground
  - — Front HO2S terminal D and power supply
  - — Front HO2S terminal E and body ground
  - — Front HO2S terminal E and power supply

*1 : LF MTX, L3
*2 : LF ATX

Rear HO2S voltage inspection

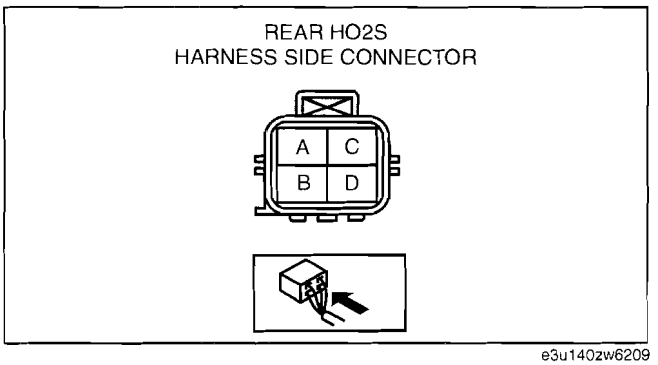
1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   - — Vehicle speed (PID: VSS)
   - — Engine speed (PID: RPM)
   - — Rear HO2S voltage (PID: O2S12)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is 3,000 rpm or more.
4. Verify that the rear HO2S outputs a voltage of **0.6 V or more**, one time or more, then verify that the rear HO2S voltage (PID: O2S12) is **0.3 V or less** while decelerating as shown in the figure.



c3u0140w021

- If not within the specification, inspect the HO2S for an open or short circuit. (See 01-40A-64 Rear HO2S circuit open/short inspection (sensor).) Then if there is no malfunction in the wiring harness, replace the rear HO2S.

Rear HO2S circuit open/short inspection (sensor)



e3u140zw6209

1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

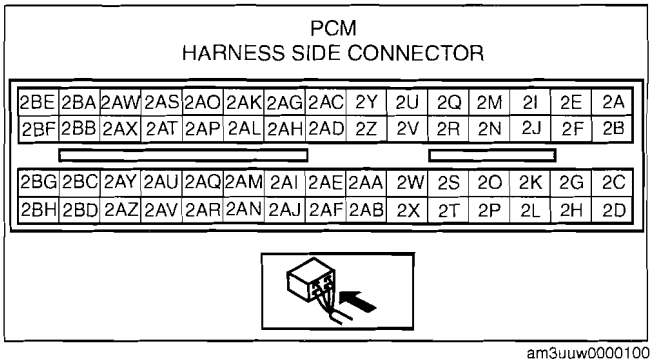
Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Rear HO2S terminal A and PCM terminal 2Q*1, 2AH*2
  - — Rear HO2S terminal B and PCM terminal 2P*1, 2AA*2

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Rear HO2S terminal A and body ground
  - — Rear HO2S terminal A and power supply
  - — Rear HO2S terminal B and power supply

*1 : LF MTX, L3
*2 : LF ATX

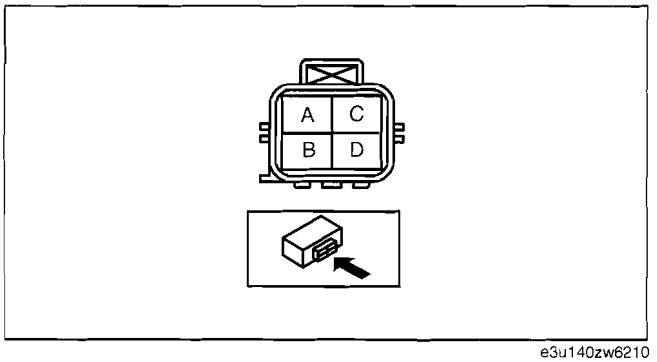


am3uuw0000100

Rear HO2S heater resistance inspection

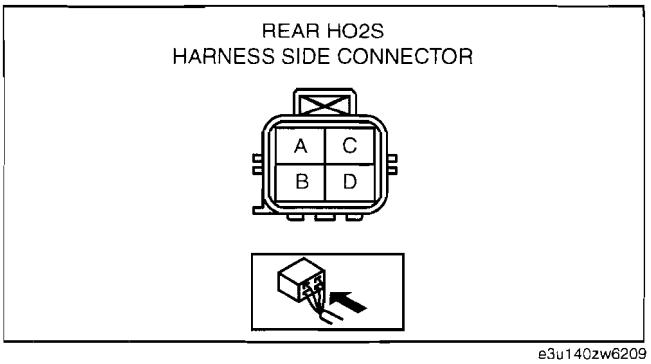
1. Disconnect the rear HO2S connector.
2. Measure the rear HO2S resistance between terminals C and D.
   - If not within the specification, replace the rear HO2S.

Rear HO2S heater resistance
2—50 ohms

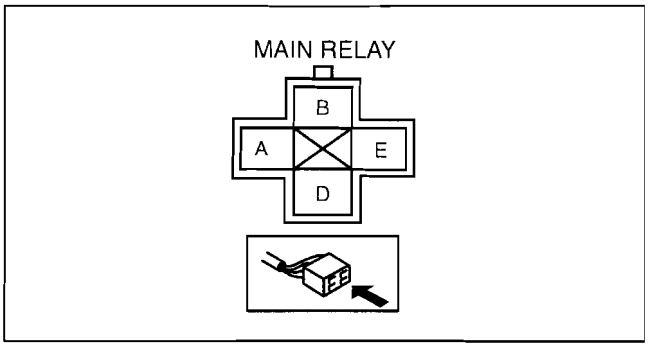


e3u140zw6210

Rear HO2S circuit open/short inspection (heater)



e3u140zw6209



e3u140zw6993

1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

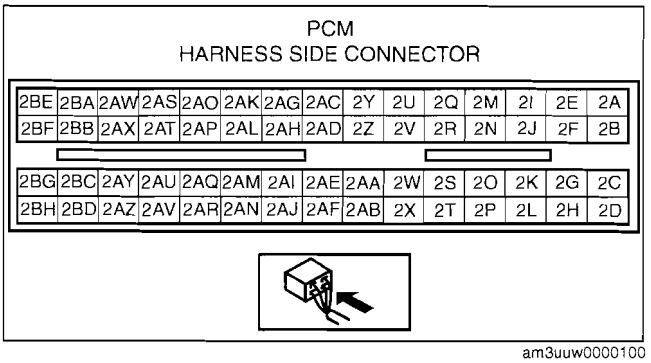
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Rear HO2S terminal C and main relay terminal A
  - — Rear HO2S terminal D and PCM terminal 2BE[*1], 2C[*2]

Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the wiring harness.

  Front and rear
  - — Rear HO2S terminal C and body ground
  - — Rear HO2S terminal D and power supply
  - — Rear HO2S terminal D and body ground

*1 : LF MTX, L3
*2 : LF ATX



am3uuw0000100

HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[LF, L3]

id0140a6804000

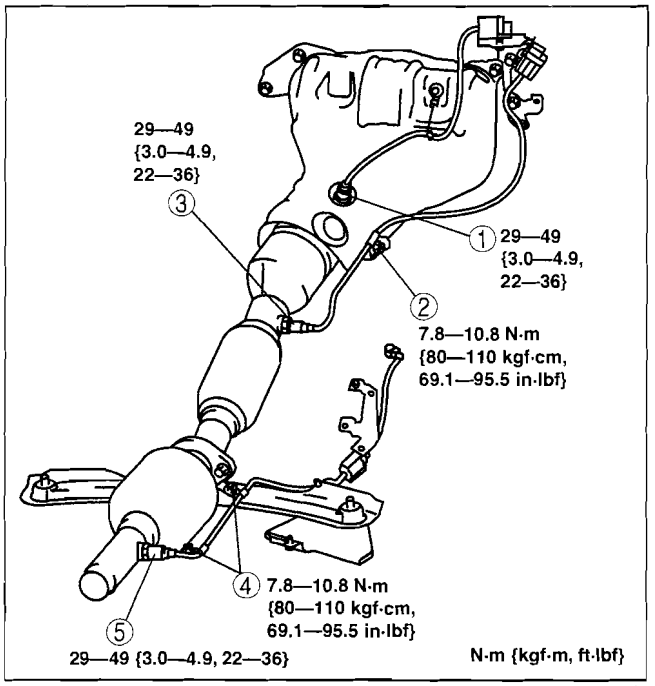
Warning

- **A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before removing the exhaust system.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the plug hole cover.
4. Disconnect the HO2S connector.
5. Remove in the order indicated in the table.

California emission regulation applicable model

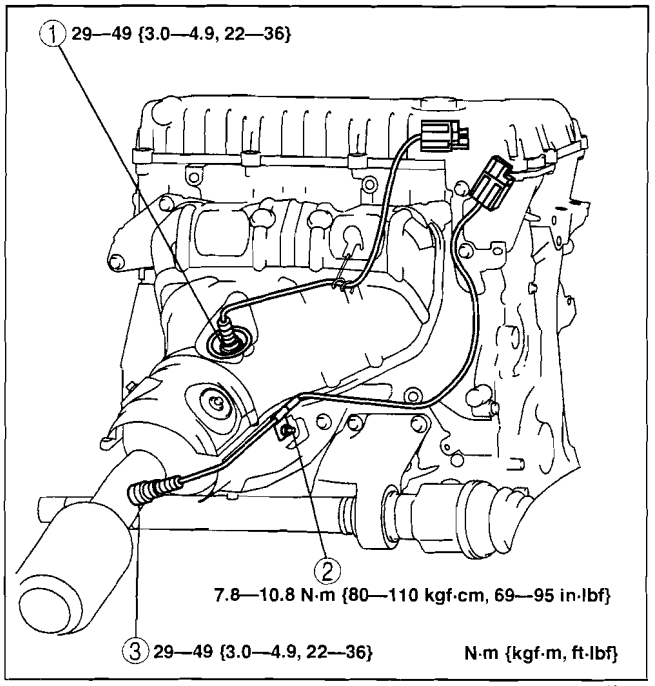
1	Front HO2S (See 01-40A-67 HO2S Removal Note.)
2	Wiring harness bracket (See 01-40A-67 Wiring Harness Bracket Installation Note.)
3	Middle HO2S (See 01-40A-67 HO2S Removal Note.)
4	Wiring harness bracket (See 01-40A-67 Wiring Harness Bracket Installation Note.)
5	Rear HO2S (See 01-40A-67 HO2S Removal Note.)



c3u0140w007

Except for California emission regulation applicable model

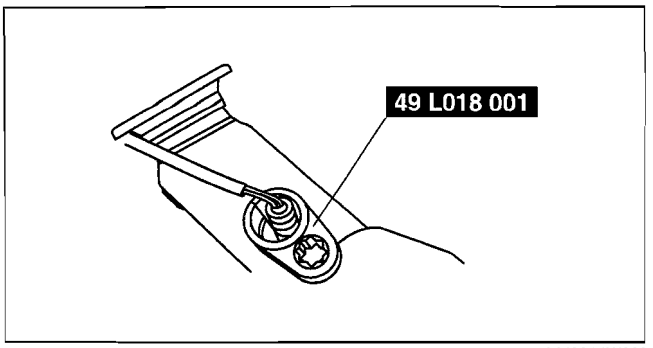
1	Front HO2S (See 01-40A-67 HO2S Removal Note.)
2	Wiring harness bracket (See 01-40A-67 Wiring Harness Bracket Installation Note.)
3	Rear HO2S (See 01-40A-67 HO2S Removal Note.)



B3E0140W015

HO2S Removal Note

1. Remove the HO2S using the **SST**.

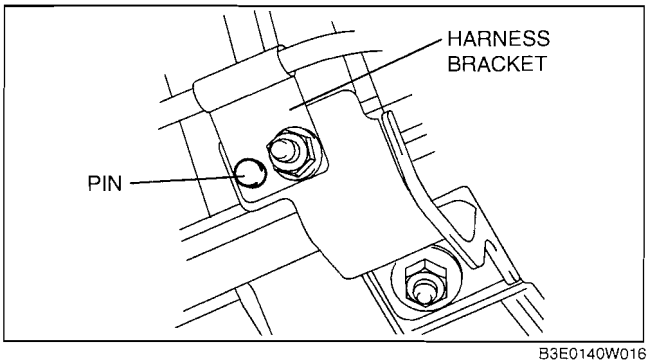


A6J3914W002

Wiring Harness Bracket Installation Note

Note

- There might be no pin. If there is no pin, lock the wiring harness bracket against rotation and tighten the nut.



B3E0140W016

CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[LF, L3]

id0140a6800600

Removal

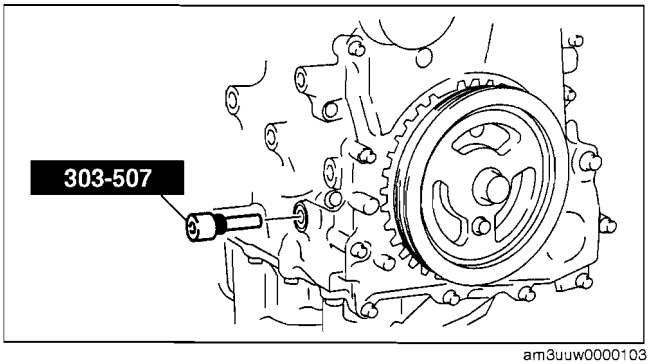
1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the plug hole cover.
4. Perform the following procedure for easier access.
   (1) Remove the front tire (RH).
   (2) Remove the splash shield.
5. Disconnect the CKP sensor connector.
6. Remove the installation bolt and remove the CKP sensor.

Installation

Caution

- **When foreign material such as an iron chip is on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CKP sensor when replacing.**

1. Perform the following procedure so that cylinder No.1 is at TDC.
   (1) Remove the cylinder block lower blind plug and install the **SST**.
   (2) Rotate the crankshaft pulley clockwise until the crank weight contacts the **SST** so that cylinder No.1 is at TDC.



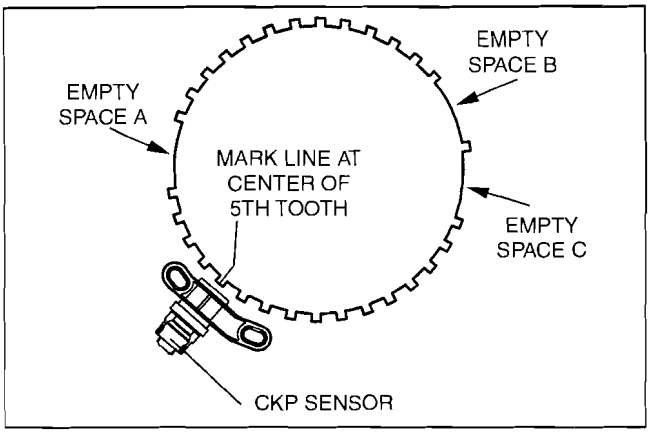
am3uuw0000103

2. Fit the center of the CKP sensor with the fifth tooth (counting counterclockwise from the empty space A as shown in the figure) of the pulse wheel.
3. Install the CKP sensor fitting bolts.

Tightening torque
5.5—7.5 N·m {56—76 kgf·cm, 4.1—5.5 ft·lbf}

4. Remove the **SST** then install the cylinder block lower blind plug.

Tightening torque
18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}



am3uuw0000103

CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3]

id0140a6800500

Note
- Perform the following inspection according to the DATA MONITOR function (indicated by monitor item from here onwards).

Air Gap Inspection
1. Verify that the CKP sensor is securely installed.
2. Using a thickness gauge, measure the air gap between the plate projections at the back of crankshaft pulley and the CKP sensor.
   - If not within the specification, inspect the plate projections for cracks or bending.
     — If there is any malfunction, replace the plate.
     — If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

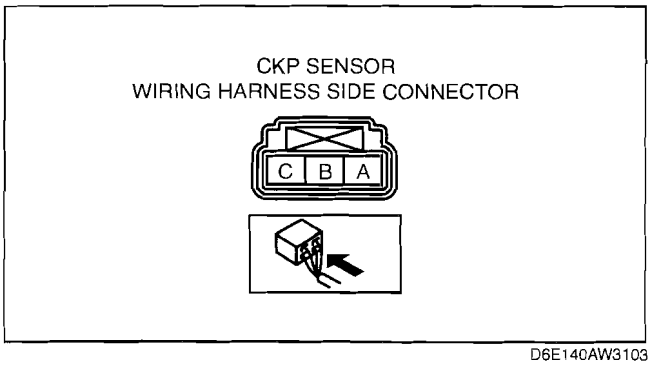
Air gap
0.5—1.5 mm {0.02—0.05 in}

Visual Inspection
1. Disconnect the negative battery cable.
2. Remove the CKP sensor. (See 01-40A-68 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF, L3].)
3. Verify that there are no metal shavings on the sensor.
   - If the monitor item condition/specification (reference) is without the specification even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

Voltage Inspection
1. Idle the engine.

Caution
- **Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.**

2. Measure the output voltage using a oscilloscope.
   - If not within the specification, replace the CKP sensor.
   - If the monitor item condition/specification (reference) is without the specification, even though the voltage is within the specification, carry out the "Circuit Open/Short Inspection".



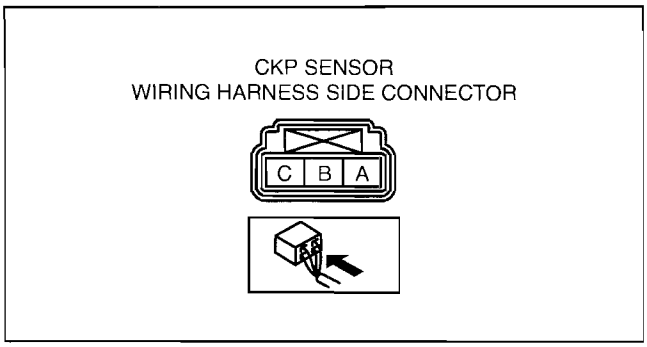
D6E140AW3103

Voltage

Terminal	Voltage (V)	Condition
A	0	Under any condition
B	4.8 or more	High output*
	0.8 or less	Low output*
C	B+	Under any condition

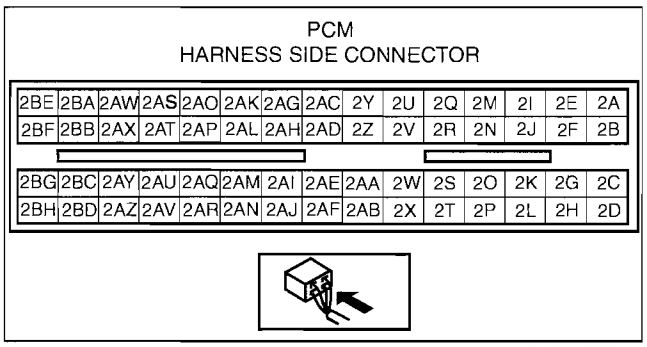
*: Output voltage varies with crankshaft rotation.

Circuit Open/Short Inspection



E6U140ZWC310

1. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



E3U140ZW6992

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - CKP sensor terminal A and body ground
  - CKP sensor terminal B and PCM terminal 2W[*1], 2U[*2]
  - CKP sensor terminal C and PCM terminal 2AQ[*1], 2T[*2]

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - CKP sensor terminal A and power supply
  - CKP sensor terminal B and power supply
  - CKP sensor terminal B and body ground
  - CKP sensor terminal C and body ground

[*1] : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

[*2] : Except for California emission regulation applicable model with LF ATX

CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION[LF, L3]

id0140a6801500

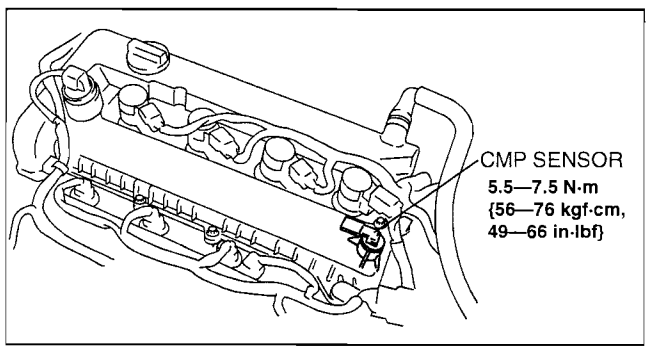
1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the plug hole cover.

Caution

- **When replacing the CMP sensor, make sure there is no foreign material on it such as metal shavings. If it is installed with foreign material, the sensor output signal will malfunction resulting from fluctuation in magnetic flux and cause a deterioration in engine control.**

4. Disconnect the CMP sensor connector.
5. Remove the CMP sensor installation bolt.
6. Remove the CMP sensor from the cylinder head cover.
7. Install in the reverse order of removal.

Tightening torque
5.5—7.5 N·m {56—76 kgf·cm, 49—66 in·lbf}



B3E0140W019

CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF, L3]

id0140a6801400

Note

- Perform the following inspection according to the DATA MONITOR function (indicated by monitor item from here onwards).

Visual Inspection

1. Disconnect the negative battery cable.
2. Remove the CMP sensor. (See 01-40A-69 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[LF, L3].)
3. Verify that there are no metal shavings on the sensor.
   - If the monitor item condition/specification (reference) is not within the specification even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

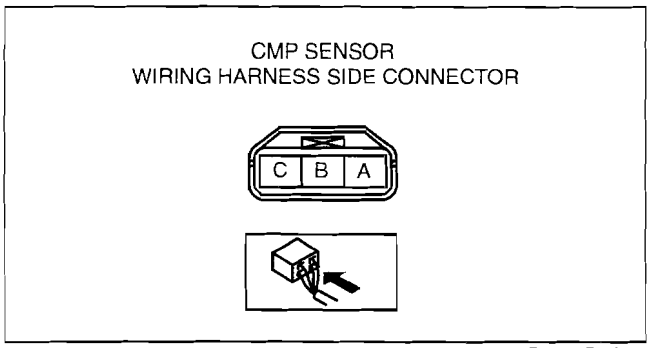
Voltage Inspection

1. Idle the engine.

Caution

- **Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.**

2. Measure the output voltage using a oscilloscope.
   - If not within the specification, replace the CMP sensor.
   - If the monitor item condition/specification (reference) is not within the specification, even though the voltage is within the specification, carry out the "Circuit Open/ Short Inspection".



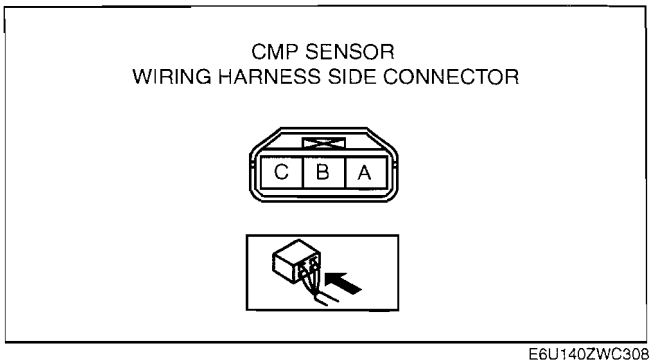
E6U140ZWC308

Voltage

Terminal	Voltage (V)	Condition
A	0	Under any condition
B	4.8 or more	High output*
	0.8 or less	Low output*
C	B+	Under any condition

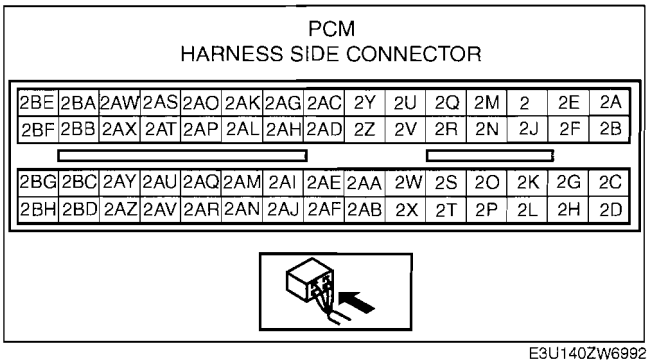
*: Output voltage varies with camshaft rotation.

Circuit Open/Short Inspection



E6U140ZWC308

1. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



E3U140ZW6992

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - — CMP sensor terminal A and body ground
  - — CMP sensor terminal B and PCM terminal 2S[*1], 2V[*2]
  - — CMP sensor terminal C and PCM terminal 2AM[*1], 2X[*2]

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - — CMP sensor terminal A and power supply
  - — CMP sensor terminal B and power supply
  - — CMP sensor terminal B and body ground
  - — CMP sensor terminal C and power supply

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

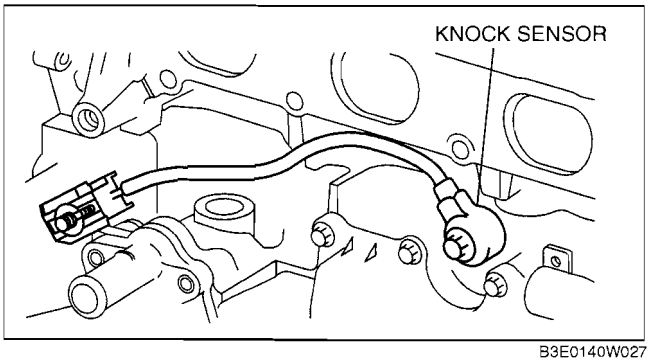
*2 : Except for California emission regulation applicable model with LF ATX

KNOCK SENSOR (KS) REMOVAL/INSTALLATION[LF, L3]

id0140a6802900

1. Remove the following part for easier access.
   - Intake manifold (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the KS connector.
3. Remove the KS installation bolt, then remove the KS.
4. Install in the reverse order of removal.

Tightening torque
16—24 N·m {1.7—2.4 kgf·m, 12—17 ft·lbf}



B3E0140W027

KNOCK SENSOR (KS) INSPECTION[LF, L3]

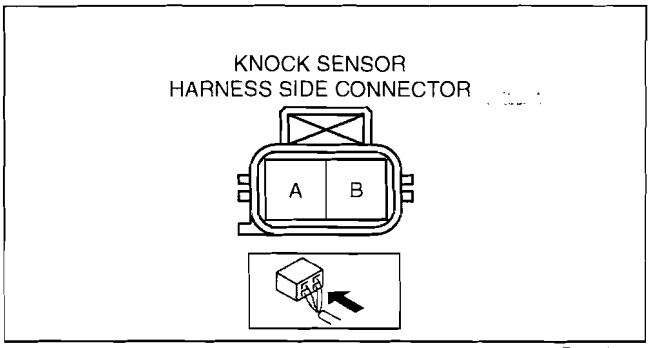
id0140a6802800

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Resistance Inspection
1. Disconnect the knock sensor connector.
2. Measure resistance between KS terminals A and B.
   - If not within the specification, replace the KS.
   - If the monitor item status/specification (reference) is not within the specification, even though the KS resistance is within the specification, perform the "Circuit Open/Short Inspection".

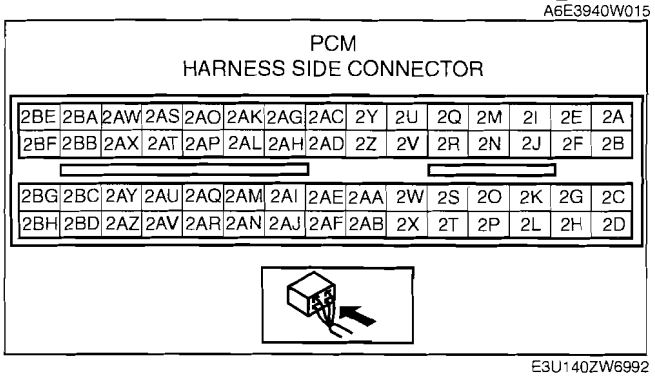
Resistance
Approx. 4.87 megohms

Circuit Open/Short Inspection



A6E3940W015

1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



E3U140ZW6992

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Knock sensor terminal A and PCM terminal 2U*1, 2Q*2
  - Knock sensor terminal B and PCM terminal 2V*1, 2R*2

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Knock sensor terminal A and power supply
  - Knock sensor terminal A and body ground
  - Knock sensor terminal B and power supply
  - Knock sensor terminal B and body ground

*1 : California emission regulation applicable model and except for California emission regulation applicable model with LF MTX, L3

*2 : Except for California emission regulation applicable model with LF ATX

BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[LF, L3]

id0140a6801100

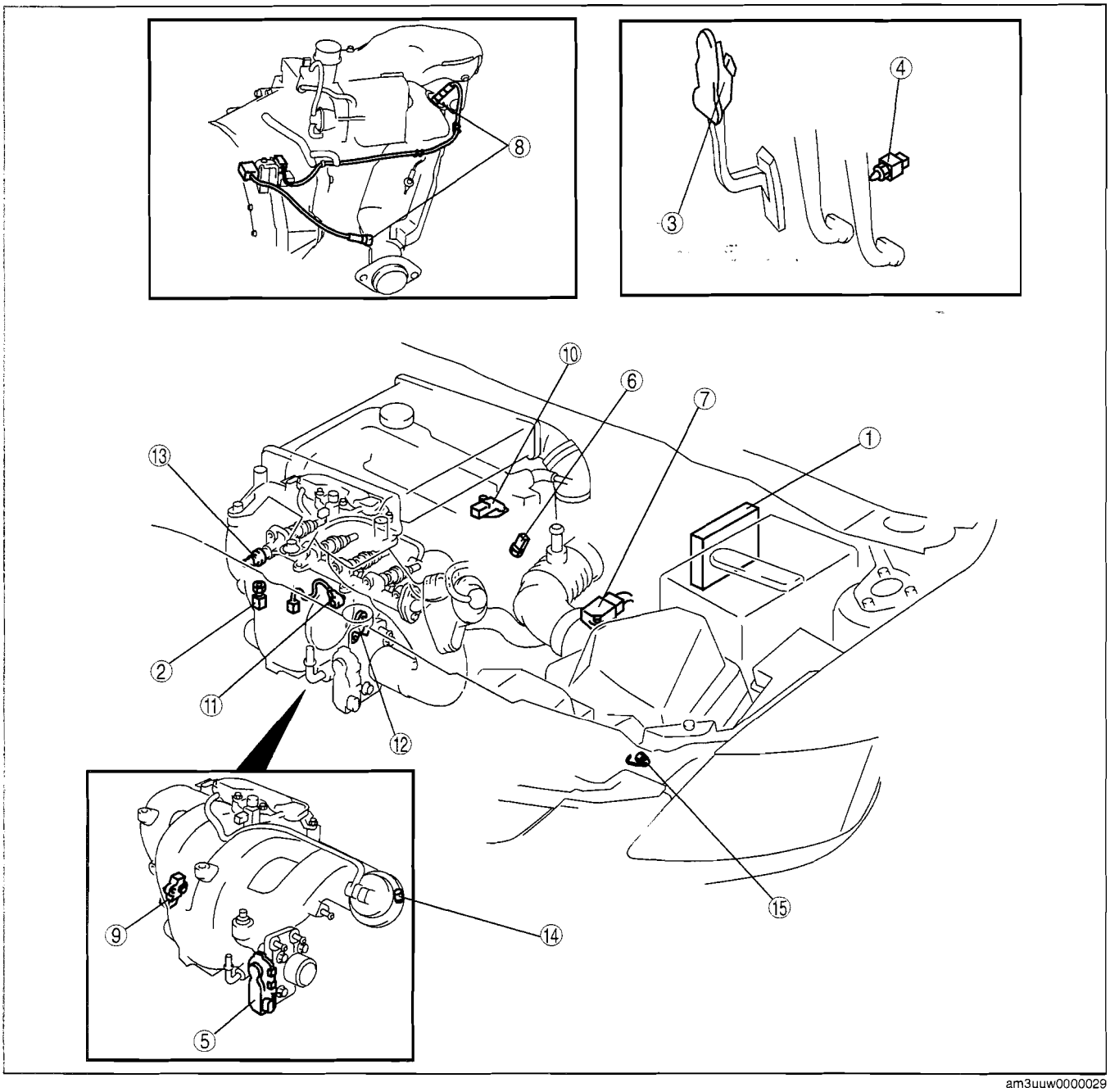
Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Select BARO on the M-MDS.
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     - If there is no open or short circuit, replace the PCM.

01-40B CONTROL SYSTEM [L3 WITH TC]

CONTROL SYSTEM COMPONENT LOCATION INDEX[L3 WITH TC]

id014039800200



am3uuw0000029

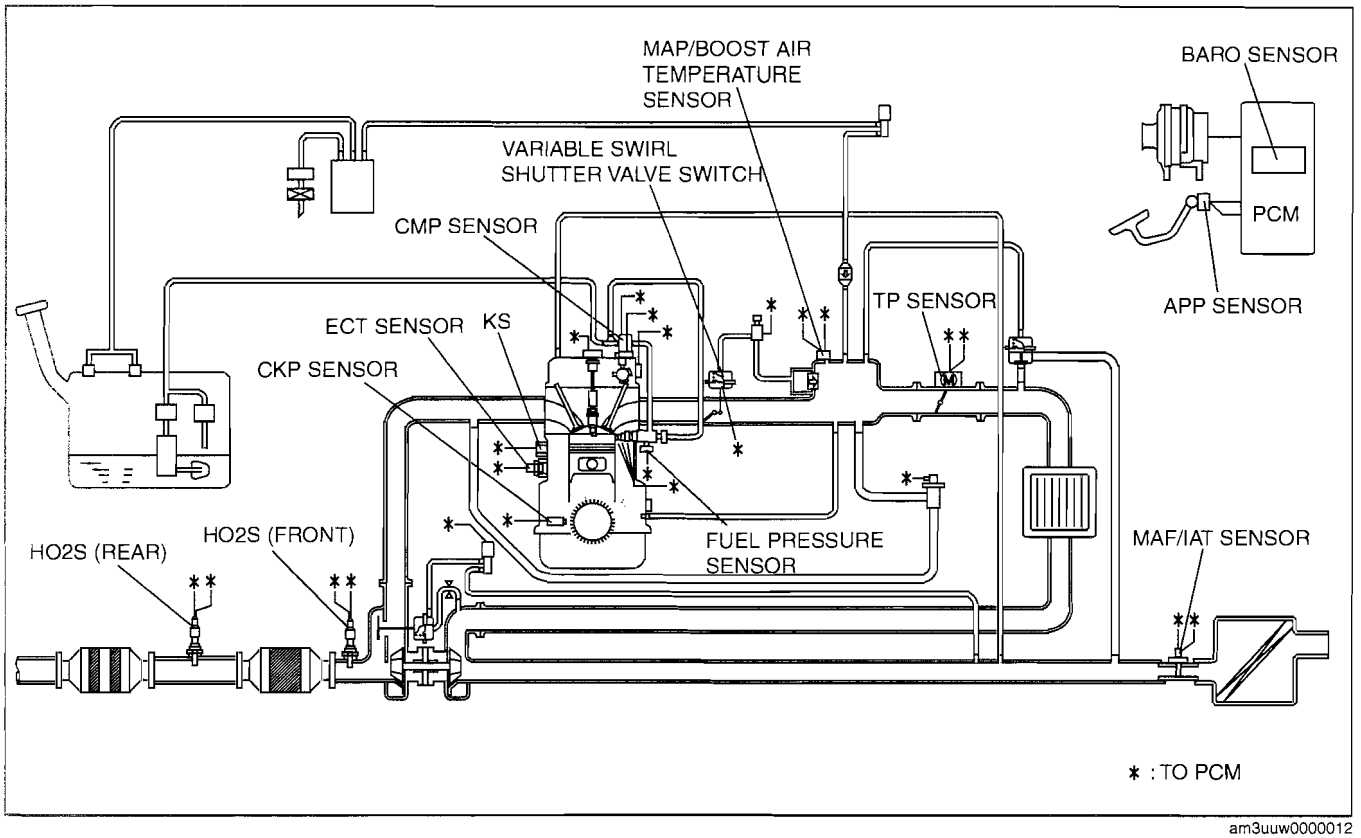
1	PCM (Built-in BARO sensor) (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].) (See01-40B-7 PCM INSPECTION[L3 WITH TC].) (See01-40B-22 PCM CONFIGURATION[L3 WITH TC].) (See01-40B-50 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[L3 WITH TC].)

2	PSP switch (See01-40B-24 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION[L3 WITH TC].)
3	APP sensor (See01-40B-36 ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC].)
4	CPP sensor (See01-40B-23 CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC].)

5	TP sensor (See01-40B-34 THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC].)
6	ECT sensor (See01-40B-27 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-40B-28 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC].)
7	MAF/IAT sensor (See01-40B-29 MASS AIR FLOW (MAF) SENSOR INSPECTION[L3 WITH TC].) (See01-40B-30 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[L3 WITH TC].)
8	HO2S (See01-40B-43 HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[L3 WITH TC].) (See01-40B-39 HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC].)
9	MAP/boost air temperature sensor (See01-40B-31 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-40B-32 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[L3 WITH TC].) (See01-40B-33 BOOST AIR TEMPERATURE SENSOR INSPECTION[L3 WITH TC].)
10	CMP sensor (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].) (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].)
11	KS (See01-40B-49 KNOCK SENSOR (KS) REMOVAL/ INSTALLATION[L3 WITH TC].) (See01-40B-49 KNOCK SENSOR (KS) INSPECTION[L3 WITH TC].)
12	CKP sensor (See01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC].) (See01-40B-45 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[L3 WITH TC].)
13	Fuel pressure sensor (See01-40B-38 FUEL PRESSURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC].) (See01-40B-38 FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC].)
14	Variable swirl shutter valve switch (See01-40B-26 VARIABLE SWIRL SHUTTER VALVE SWITCH INSPECTION[L3 WITH TC].)
15	Neutral switch (See01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC].)

CONTROL SYSTEM DIAGRAM[L3 WITH TC]

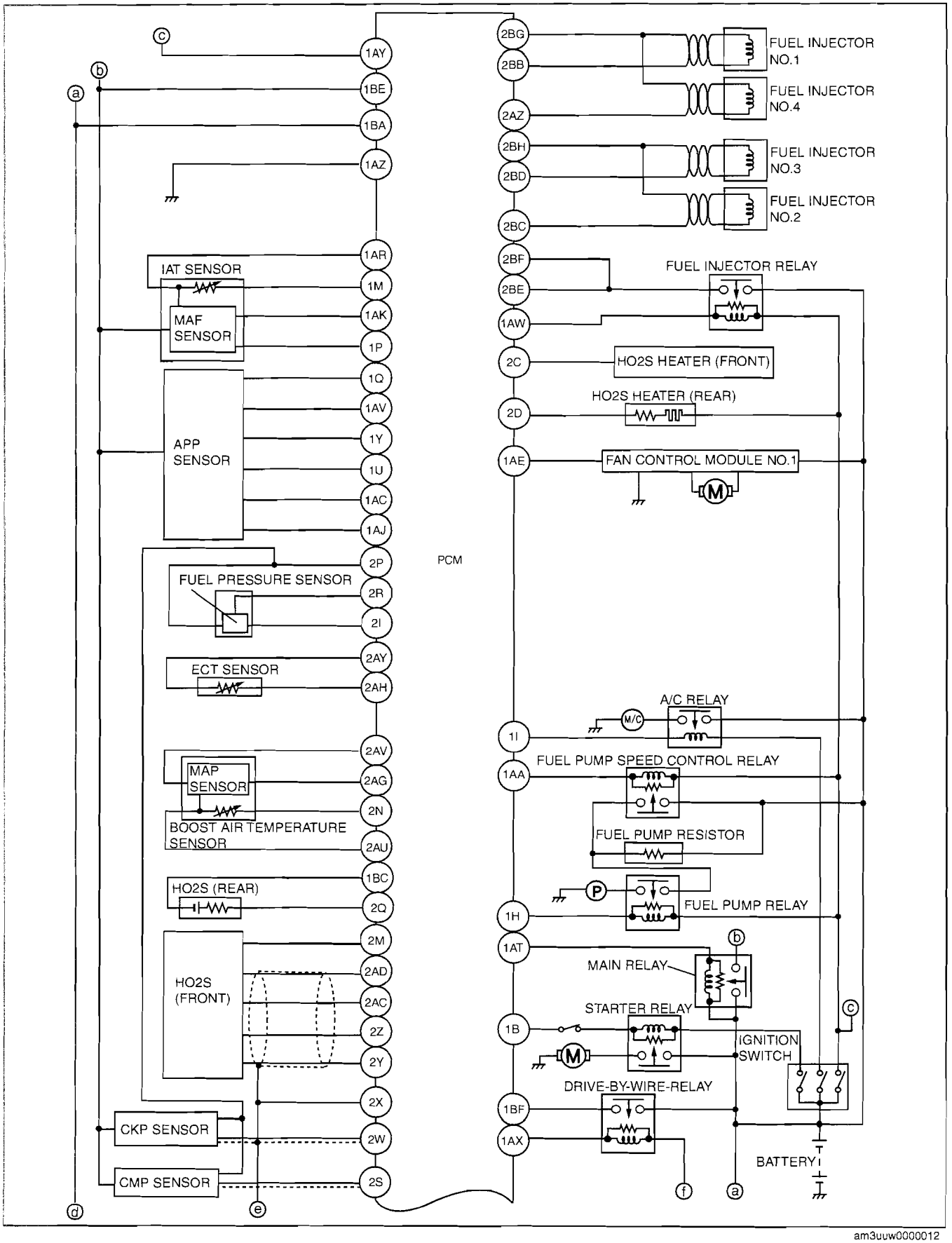
id0140398003OO



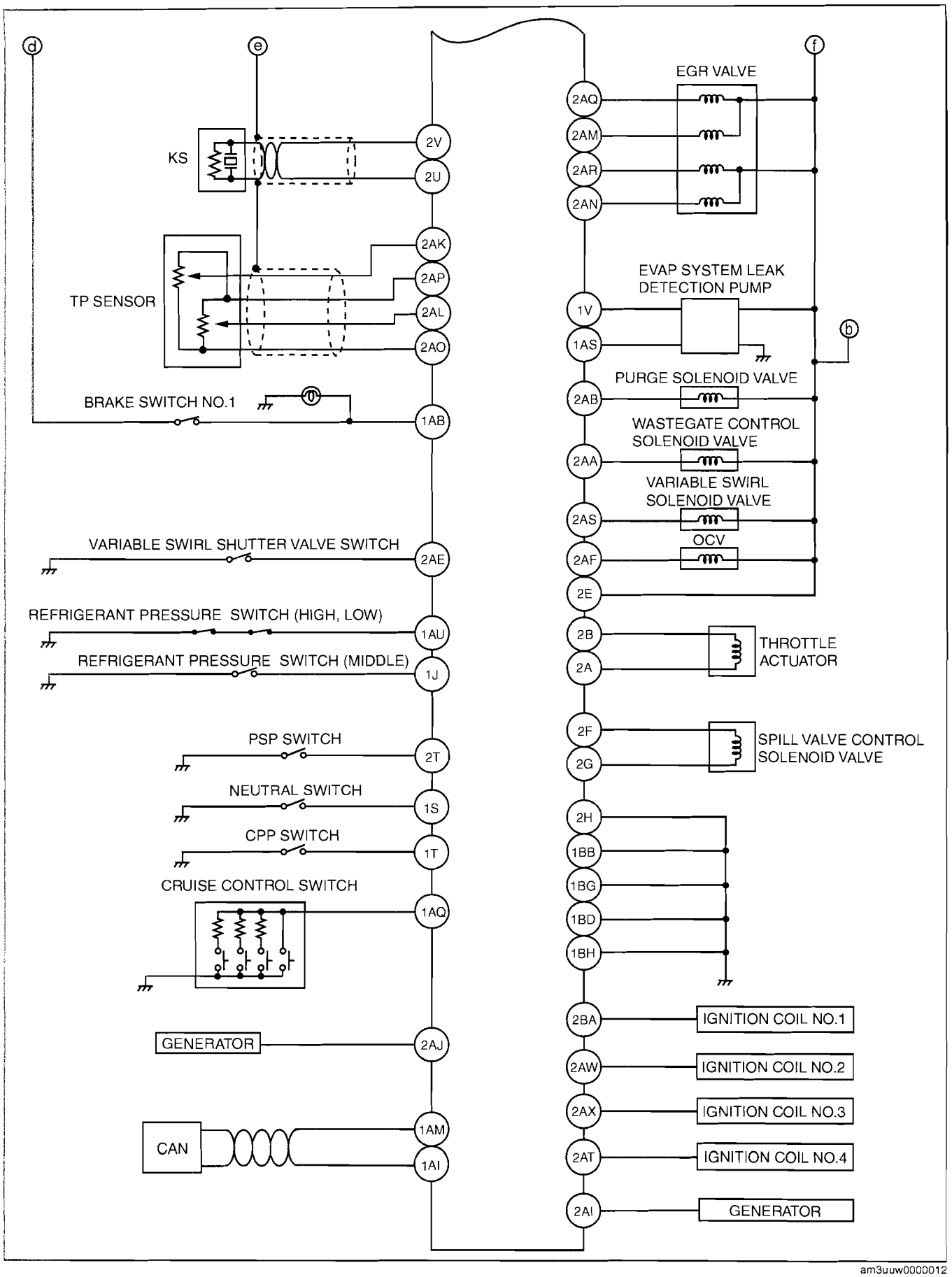
am3uuw0000012

CONTROL SYSTEM WIRING DIAGRAM[L3 WITH TC]

id014039800400



am3uuw0000012



am3uuw0000012

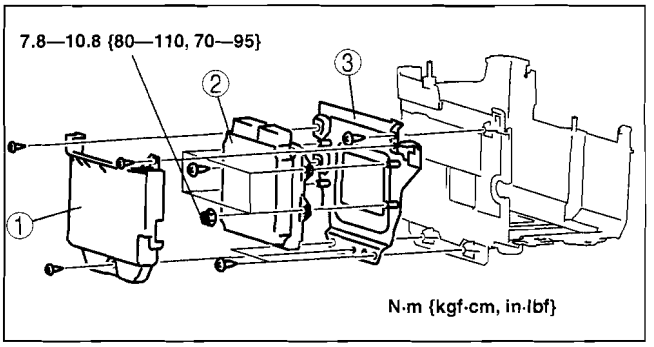
PCM REMOVAL/INSTALLATION[L3 WITH TC]

id014039802400

Note
- For PCM replacement, set up the M-MDS and perform the PCM configuration. (See 01-40B-22 PCM CONFIGURATION[L3 WITH TC].)

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Disconnect the PCM connector.
4. When replacing the PCM on the vehicles, perform the following.
   - PCM parameter reset (See09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
5. Install in the reverse order of removal.

1	PCM cover
2	PCM
3	PCM bracket



am3uuw0000050

PCM INSPECTION[L3 WITH TC]

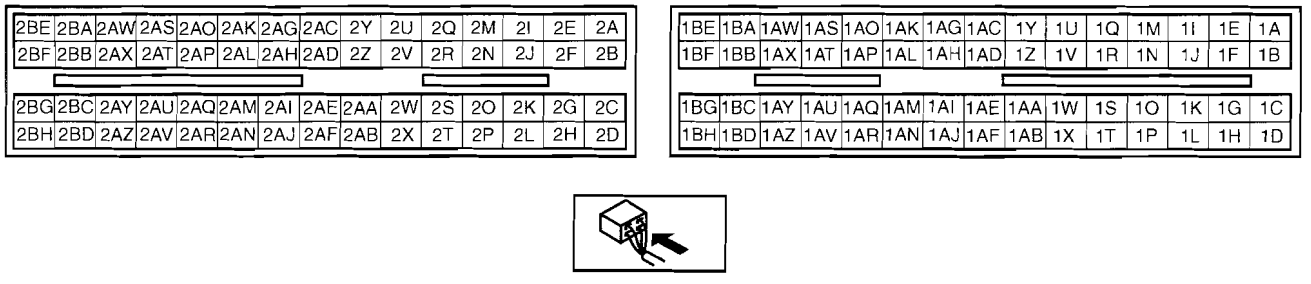
id014039802500

Without Using the M-MDS

Note
- The PCM terminal voltage can vary with the conditions when measuring and changes due to aged deterioration on the vehicle, causing false diagnosis. Therefore determine comprehensively where the malfunction occurs among the input systems, output systems, and the PCM.

PCM terminal voltage table (Reference)

PCM
WIRING HARNESS SIDE CONNECTOR



acxuuw00000125

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1A	—	—	—	—	—
1B	Starter relay control	Starter relay	Ignition switch off after 10 s	Below 1.0	• Starter relay • Related wiring harness
			Ignition switch to the ON position	Below 1.0	
1C	—	—	—	—	—
1D	Clutch operation	CPP switch	Clutch pedal depressed	Below 1.0	• CPP switch • Related wiring harness
			Clutch pedal released	B+	
1E	—	—	—	—	—
1F	—	—	—	—	—
1G	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1H	Fuel pump control	Fuel pump relay	Ignition switch to the ON position after 10 s		B+	• Fuel pump relay • Related wiring harness
			Cranking		B+	
			Idle		Below 1.0	
1I	A/C	A/C relay	Idle	A/C operating	Below 1.0	• A/C relay • Related wiring harness
				A/C not operating	B+	
1J	Refrigerant pressure switch (middle)	Refrigerant pressure switch (middle)	A/C ON	Refrigerant pressure is more than the specification. (Refrigerant pressure switch (middle) is on.)	Below 1.0	• Refrigerant pressure switch • Related wiring harness
				Refrigerant pressure is less than the specification. (Refrigerant pressure switch (middle) is off.)	B+	
1K	—	—	—		—	—
1L	—	—	—		—	—
1M	IAT	MAF/IAT sensor	Ignition switch to the ON position	IAT 20 °C {68 °F}	2.4—2.6	• MAF/IAT sensor • Related wiring harness
				IAT 30 °C {86 °F}	1.7—1.9	
1N	—	—	—		—	—
1O	—	—	—		—	—
1P	MAF sensor ground	MAF/IAT sensor	Under any condition		Below 1.0	• Related wiring harness
1Q	—	—	—		—	—
1R	—	—	—		—	—
1S	Neutral position	Neutral switch	Shift lever is at neutral position		Below 1.0	• Neutral switch • Related wiring harness
			Shift lever is not at neutral position		B+	
1T	—	—	—		—	—
1U	APP sensor ground	APP sensor	Under any condition		Below 1.0	• Related wiring harness • APP sensor
1V	EVAP leak detection pump (solenoid)	EVAP leak detection pump	Ignition switch to the ON position		B+	• EVAP leak detection pump • Related wiring harness
1W	—	—	—		—	—
1X	—	—	—		—	—
1Y	APP sensor (No.1)	APP sensor	Ignition switch to the ON position	When the accelerator pedal is released	1.56—1.65	• APP sensor • Related wiring harness
				When the accelerator pedal is depressed	3.65—3.93	
1Z	—	—	—		—	—
1AA	Fuel pump speed control	Fuel pump speed control relay	Ignition switch to the ON position after 10 s		B+	• Fuel pump speed control relay • Related wiring harness
			Cranking		Below 1.0	
			Idle		Below 1.0	

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
1AB	Brake	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harness
			Brake pedal released		Below 1.0	
1AC	APP sensor (No.2)	APP sensor (No.2)	Ignition switch to the ON position	When the accelerator pedal is released	1.01—1.10	• APP sensor • Related wiring harness
				When the accelerator pedal is depressed	3.10—3.38	
1AD	—	—	—		—	—
1AE	Fan control module	Fan control module	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Fan control module • Related wiring harness
1AF	—	—	—		—	—
1AG	—	—	—		—	—
1AH	—	—	—		—	—
1AI	CAN (L)	CAN related module	Because this terminal is for CAN, no valid determination of terminal voltage is possible			• Related wiring harness
1AJ	Constant voltage	APP sensor	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness
1AK	MAF	MAF/IAT sensor	Ignition switch to the ON position		Approx. 0.7	• MAF/IAT sensor • Related wiring harness
			Idle		Approx. 1.3	
1AL	—	—	—		—	—
1AM	CAN (H)	CAN related module	Because this terminal is for CAN, no valid determination of terminal voltage is possible			• Related wiring harness
1AN	—	—	—		—	—
1AO	—	—	—		—	—
1AP	—	—	—		—	—
1AQ	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Related wiring harness
				CANCEL switch pressed in	Approx. 1.1	
				SET/COAST switch pressed in	Approx. 3.1	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5.0	
1AR	IAT sensor ground	MAF/IAT sensor	Under any condition		Below 1.0	• Related wiring harness
1AS	EVAP leak detection pump (pump)	EVAP leak detection pump	Ignition switch to the ON position		Below 1.0	• EVAP leak detection pump • Related wiring harness
			Idling		B+	
1AT	Main relay control	Main relay	Ignition switch off after 10 s		B+	• Main relay • Related wiring harness
			Ignition switch to the ON position		Below 1.0	
1AU	A/C on signal	Refrigerant pressure switch (high, low)	Idle	A/C switch and fan switch on	B+	• Refrigerant pressure switch (high, low) • Related wiring harness
1AV	APP sensor ground	APP sensor	Under any condition		Below 1.0	• Related wiring harness
1AW	Injector control	Fuel Injector relay	Under any condition		Below 1.0	• Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1AX	Drive-by-wire relay control	Drive-by-wire relay	Ignition switch off after 10 s	B+	• Related wiring harness
			Ignition switch to the ON position	Below 1.0	
1AY	Ignition switch	Ignition switch	Ignition switch off	Below 1.0	• Related wiring harness
			Ignition switch to the ON position	B+	
1AZ	Ground	Ground	Under any condition	Below 1.0	• Related wiring harness
1BA	Back-up power supply	Battery (positive terminal)	Under any condition	B+	• Battery • Related wiring harness
1BB	Ground	Ground	Under any condition	Below 1.0	• Related wiring harness
1BC	Sensor ground	HO2S (rear)	Under any condition	Below 1.0	• HO2S (rear) • Related wiring harness
1BD	Ground	Ground	Under any condition	Below 1.0	• Related wiring harness
1BE	B+	Main relay	Ignition switch off after 10 s	Below 1.0	• Battery • Related wiring harness
			Ignition switch to the ON position	B+	
1BF	Drive-by-wire power supply	Drive-by-wire relay	Ignition switch off after 10 s	Below 1.0	• Related wiring harness
			Ignition switch to the ON position	B+	
1BG	Ground	Ground	Under any condition	Below 1.0	• Related wiring harness
1BH	Ground	Ground	Under any condition	Below 1.0	• Related wiring harness
2A	Throttle actuator control (+)	Throttle body	Ignition switch off	Approx. 1.5	• Throttle actuator • Related wiring harness
			Ignition switch to the ON position	B+	
2B	Throttle actuator control (–)	Throttle body	Ignition switch off	Approx. 1.5	• Throttle actuator • Related wiring harness
			Ignition switch to the ON position	B+	
2C	HO2S (front) heater control	HO2S (front) heater	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• HO2S (front) • Related wiring harness
2D	HO2S (rear) heater control	HO2S (rear) heater	• Engine speed above 5,000 rpm (Heater control not operating)	B+	• HO2S (rear) heater • Related wiring harness
2E	Power supply	Main relay, Variable swirl solenoid valve, CMP sensor	Ignition switch off after 10 s	Below 1.0	• Main relay • Related wiring harness
			Ignition switch to the ON position	B+	
2F	High pressure fuel pump control (+)	High pressure fuel pump	Ignition switch off	Below 1.0	• High pressure fuel pump • Related wiring harness Related wiring harness
			Ignition switch to the ON position	Approx. 9.7	
			Idle	Approx. 9.4	
2G	High pressure fuel pump control (–)	High pressure fuel pump	Ignition switch off	Below 1.0	• High pressure fuel pump • Related wiring harness Related wiring harness
			Ignition switch to the ON position	Approx. 9.6	
			Idle	Approx. 8.6	
2H	Ground	Body ground	Under any condition	Below 1.0	• Related wiring harness
2I	Constant voltage (Vref)	Fuel pressure sensor	Ignition switch to the ON position	Approx. 5.0	• Related wiring harness
2J	—	—	—	—	—
2K	—	—	—	—	—
2L	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2M	Sensor ground	HO2S (front)	Under any condition		Below 1.0	• Related wiring harness
2N	Boost air temperature	MAP/Boost air temperature sensor	Ignition switch to the ON position	IAT 20 °C {68 °F}	2.4—2.6	• Boost air temperature sensor • Related wiring harness
				IAT 30 °C {86 °F}	1.7—1.9	
2O	—	—	—		—	—
2P	Sensor ground	Fuel pressure sensor	Under any condition		Below 1.0	• Fuel pressure sensor • Related wiring harness
2Q	HO2S (rear)	HO2S (rear)	Idle		0—1	• HO2S (rear) • Related wiring harness
2R	Fuel pressure sensor	Fuel pressure sensor	Ignition switch off		Below 1.0	• Fuel pressure sensor • Related wiring harness
			Ignition switch to the ON position		Approx. 1.1	
			Idle		Approx. 1.7	
2S	CMP	CMP sensor	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• CMP sensor • Related wiring harness
2T	PSP	PSP switch	Idle	Steering wheel at straight ahead position	B+	• PSP switch • Power steering system • Related wiring harness
				While turning steering wheel	Below 1.0	
2U	Knocking (+)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Approx. 4.3	• KS • Related wiring harness
2V	Knocking (–)	KS	Ignition switch to the ON position (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Below 1.0	• KS • Related wiring harness
2W	CKP	CKP sensor	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• CKP sensor • Related wiring harness
2X	Internal ground	KS, CMP sensor, CKP sensor, HO2S (Front), TP sensor	Under any condition		Below 1.0	• Related wiring harness
2Y	HO2S (front) calibration resistor	HO2S (front)	Ignition switch off after 10s		Below 1.0	• HO2S (front) • Related wiring harness
			Ignition switch to the ON position		Approx. 3.9	
2Z	HO2S (front) power supply	HO2S (front)	Idle (after warm up)		Approx. 6.2	• HO2S (front) • Related wiring harness
2AA	Wastegate control solenoid valve	Wastegate control solenoid valve	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Wastegate control solenoid valve • Related wiring harness
2AB	Purge solenoid valve	Purge solenoid valve	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Purge solenoid valve • Related wiring harness
2AC	HO2S (front) negative current	HO2S (front)	Idle (after warm up)		Approx. 3.7	• HO2S (front) • Related wiring harness

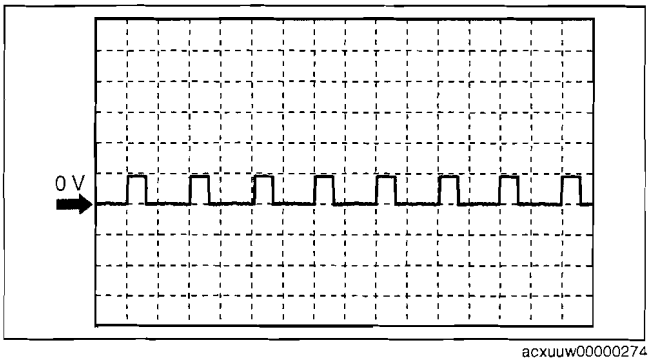
Terminal	Signal	Connected to	Test condition		Voltage (V)	Inspection item
2AD	HO2S (front) positive current	HO2S (front)	Idle (after warm up)		Approx. 3.7	• HO2S (front) • Related wiring harness
			After racing		2.1—4.8	
2AE	Variable swirl shutter valve monitor	Variable swirl shutter valve switch	variable swirl shutter valve close		Below 1.0	• Variable swirl shutter valve switch • Related wiring harness
			variable swirl shutter valve open		B+	
2AF	OCV control	OCV	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• OCV valve • Related wiring harness
2AG	Manifold absolute pressure	MAP sensor	Ignition switch to the ON position)		Approx. 1.9	• MAP sensor • Related wiring harness
			Idle (after warm up)		Below 1.0	
2AH	ECT	ECT sensor	Ignition switch to the ON position	ECT 20 °C {68 °F}	3.04—3.14	• ECT sensor • Related wiring harness
				ECT 60 °C {140 °F}	1.29—1.39	
2AI	Generator field coil control	Generator (terminal D)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
2AJ	Generator output voltage	Generator (terminal P)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Generator • Related wiring harness
2AK	TP sensor (No. 1)	TP sensor (No. 1)	Ignition switch to the ON position	APP is released	0.4—0.6	• TP sensor • Related wiring harness
				APP is depressed	4.7—4.9	
2AL	TP sensor (No. 2)	TP sensor (No. 2)	Ignition switch to the ON position	APP is released	4.4—4.6	• TP sensor • Related wiring harness
				APP is depressed	0.1—0.3	
2AM	EGR valve #3 coil control	EGR valve (terminal A)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Ignition switch off		Below 1.0	
2AN	EGR valve #6 coil control	EGR valve (terminal F)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Idle		B+	
2AO	Constant voltage (Vref)	TP sensor	Ignition switch to the ON position		Approx. 5.0	• TP sensor • Related wiring harness
2AP	TP sensor ground	TP sensor	Under any condition		Below 1.0	• TP sensor • Related wiring harness
2AQ	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch to the ON position		Below 1.0	• EGR valve • Related wiring harness
			Idle		Below 1.0	
2AR	EGR valve #4 coil control	EGR valve (terminal B)	Ignition switch to the ON position		B+	• EGR valve • Related wiring harness
			Ignition switch off		Below 1.0	
2AS	Variable swirl control	Variable swirl solenoid valve	ECT 62 °C {144 °F} or more and engine speed 3,250 rpm or more		B+	• Variable swirl solenoid valve • Related wiring harness
			ECT less than 62 °C {144 °F} and engine speed less than3,250 rpm		Below 1.0	
2AT	IGT4	Ignition coil (No.4 cylinders)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Ignition coil No.4 • Related wiring harness
2AU	Constant voltage (Vref)	MAP sensor	Ignition switch to the ON position		Approx. 5.0	• Related wiring harness
2AV	Sensor ground	MAP sensor	Under any condition		Below 1.0	• Related wiring harness
2AW	IGT2	Ignition coil (No.2 cylinders)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)			• Ignition coil No.2 • Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
2AX	IGT3	Ignition coil (No.3 cylinders)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Ignition coil No.3 • Related wiring harness
2AY	Sensor ground	ECT sensor	Under any condition	Below 1.0	• ECT sensor • Related wiring harness
2AZ	Fuel injection (–)(#4)	Fuel injector (No.4)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.4 • Related wiring harness
2BA	IGT1	Ignition coil (No.1 cylinders)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Ignition coil No.1 • Related wiring harness
2BB	Fuel injection (–)(#1)	Fuel injector (No.1)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.1 • Related wiring harness
2BC	Fuel injection (–)(#2)	Fuel injector (No.2)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.2 • Related wiring harness
2BD	Fuel injection (–)(#3)	Fuel injector (No.3)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.3 • Related wiring harness
2BE	Fuel injector power supply 1	Fuel Injector relay	Ignition switch off	Below 1.0	• Fuel Injector relay • Related wiring harness
			Ignition switch to the ON position	B+	
2BF	Fuel injector power supply 2	Fuel Injector relay	Ignition switch off	Below 1.0	• Fuel Injector relay • Related wiring harness
			Ignition switch to the ON position	B+	
2BG	Fuel injection (+)(#1, #4)	Fuel injector (No.1,No.4)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.1, No.4 • Related wiring harness
2BH	Fuel injection (+)(#2, #3)	Fuel injector (No.2, No.3)	• Inspect using the wave profile. (See01-40B-13 Inspection Using An Oscilloscope (Reference).)		• Fuel injector No.2, No.3 • Related wiring harness

Inspection Using An Oscilloscope (Reference)
Fan control module signal
PCM terminals
- 1AE (+)—body ground (–)

Oscilloscope setting
- 5 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

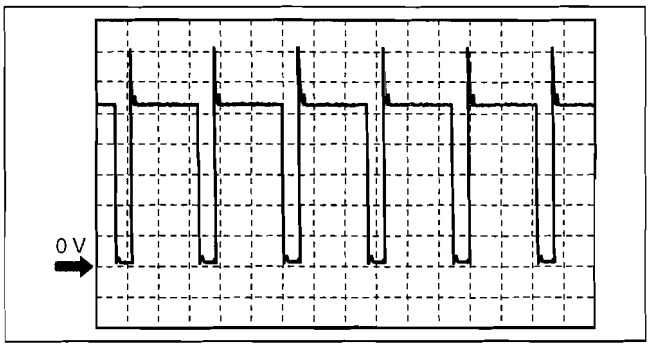


acxuuw00000274

HO2S (front) heater control signal
PCM terminals
- 2C (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

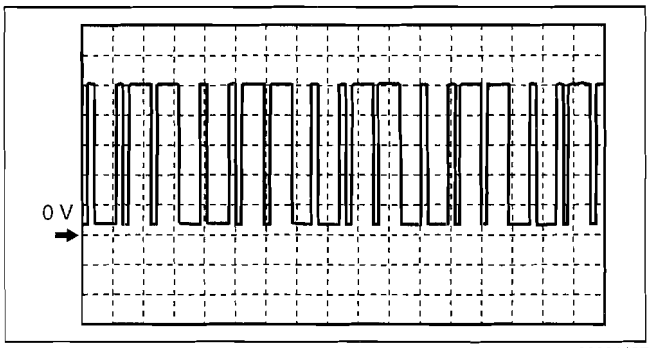


acxuuw00000275

CMP sensor signal
PCM terminals
- 2S (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 100 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

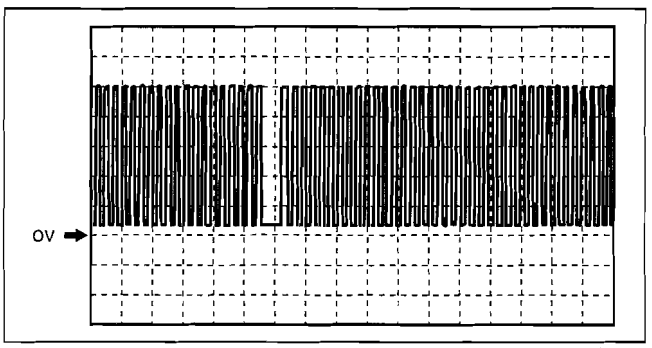


acxuuw00000127

CKP sensor signal
PCM terminals
- 2W (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

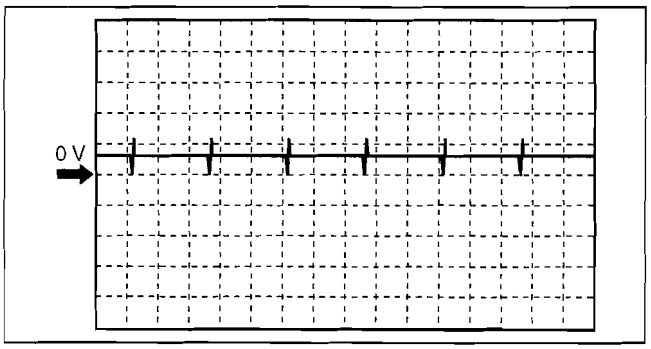


acxuuw00000128

Wastegate control solenoid valve signal
PCM terminals
- 2AA (+)—body ground (–)

Oscilloscope setting
- 20 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Ignition switch to the ON position

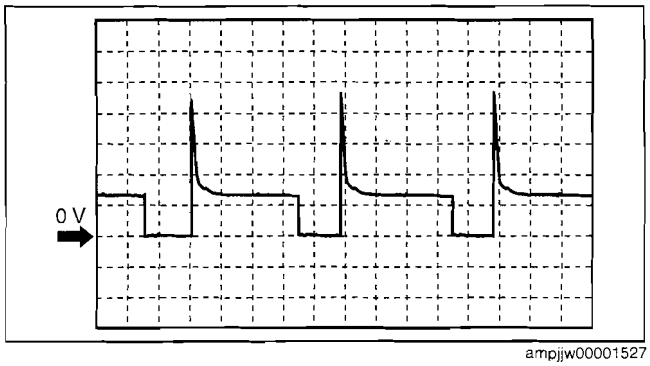


acxuuw00002325

Purge control signal
PCM terminals
- 2AB (+)—body ground (–)

Oscilloscope setting
- 10 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Engine speed is 2,000 rpm

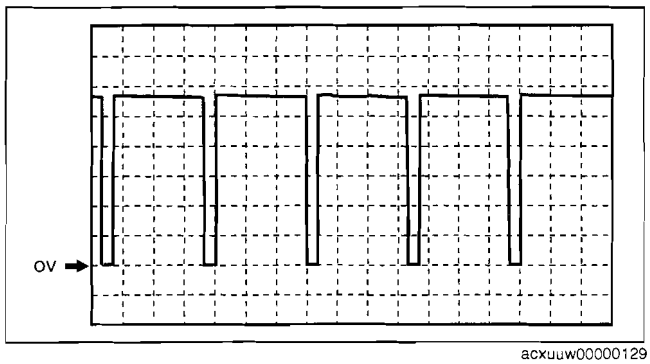


ampjjw00001527

OCV signal
PCM terminals
- 2AF (+)—body ground (–)

Oscilloscope setting
- 2.5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

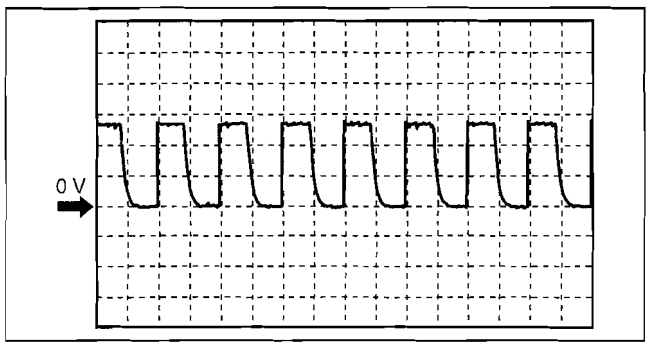


acxuuw00000129

Generator field coil control signal
PCM terminals
- 2AI (+)—body ground (–)

Oscilloscope setting
- 0.5 V/DIV (Y), 2 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 650 rpm, no load)

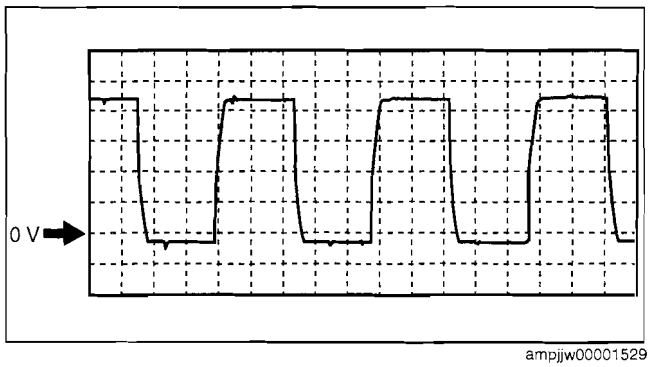


ampjjw00001528

Generator output voltage signal
PCM terminals
- 2AJ (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y),1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)



ampjjw00001529

IGT1, IGT2, IGT3, IGT4 control signals
PCM terminals
- IGT1 (No.1): 2BA (+)—body ground (–)
- IGT2 (No.2): 2AW (+)—body ground (–)
- IGT3 (No.3): 2AX (+)—body ground (–)
- IGT4 (No.4): 2AT (+)—body ground (–)

Oscilloscope setting
- 2 V/DIV (Y), 20 ms/DIV (X), DC range

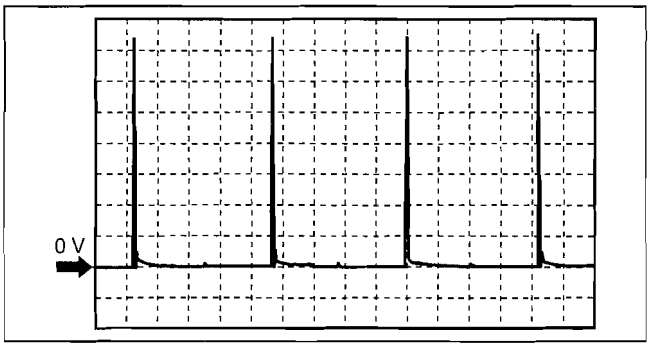
Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

ampjiw00000781

Fuel injection control (–)
PCM terminals
- Fuel injection No.1: 2BB (+)—body ground (–)
- Fuel injection No.2: 2BC (+)—body ground (–)
- Fuel injection No.3: 2BD (+)—body ground (–)
- Fuel injection No.4: 2AZ (+)—body ground (–)

Oscilloscope setting
- 10 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

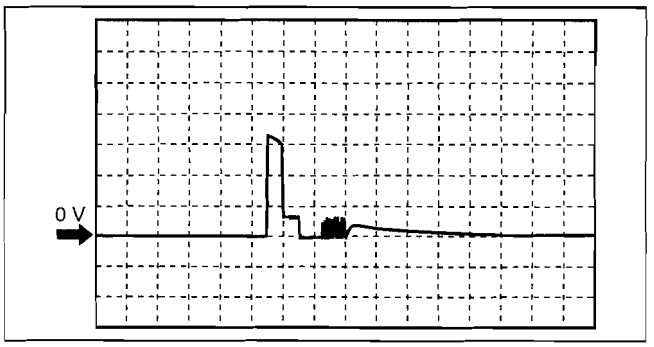


acxuuw00002326

Fuel injection control (+)
PCM terminals
- Fuel injection No.1, No.4: 2BG (+)—body ground (–)
- Fuel injection No.2, No.3: 2BH (+)—body ground (–)

Oscilloscope setting
- 20 V/DIV (Y), 400 µs/DIV (X), DC range

Vehicle condition
- Idle after warm up (no load, P/S off, A/C off)

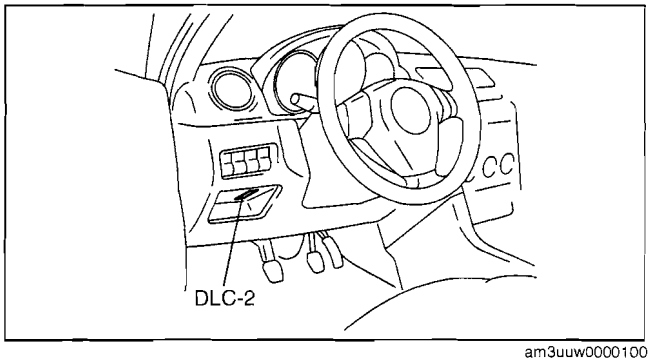


acxuuw00000277

Using the M-MDS

Note
- PIDs for the following parts are not available on this model. Perform the specific inspections for the following parts:
  — CMP sensor (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC].)
  — Main relay

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Measure the PID value.
   - If PID value is not within the specification, follow the instructions in the "Inspection item"column.



am3uuw0000100

Note
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- For input/output signals except those of the monitoring items, use a voltmeter to measure the PCM terminal voltage.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
  — ACCS, ALTF, ARPMDES, FAN_DUTY, EVAPCP, FP, FUELPW1, GENVDSD, HTR11, HTR12, IMRC, INJ_1, INJ_2, INJ_3, INJ_4, SEGRP, test, VT DUTY1 Wt, WGC

PID/DATA monitor table (reference)

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Inspection item	PCM terminal
AAT (Ambient air temperature)	°C	°F	Ignition switch to the ON position: Indicate the ambient air temperature	• MAF/IAT sensor	1M
AC_REQ (Refrigerant pressure switch (high, low))	On/Off		Refrigerant pressure is more than the specification or less than the specification. (Refrigerant pressure switch (high, low) is off.): Off Except above: On	• Refrigerant pressure switch (high, low)	1AU
ACCS (A/C relay)	On/Off		A/C relay is ON: On A/C relay is OFF: Off	• The following PIDs: — RPM, TP, ECT • A/C relay	1I
AFR (Air/fuel ratio)	—		Target air-oil ratio is displayed	• HO2S	2Q 2Z 2AC 2AD
AFR_ACT (Actual air/ fuel ratio)	—		Actual air-oil ratio is displayed	• HO2S	2Q 2Z 2AC 2AD
ALTF (Generator field coil control duty value)	%		Ignition switch to the ON position: 0% Idle: 0—100% Just after A/C switch ON and fan switch ON at idle: Duty value rises	• The following PIDs: — IAT, ECT, RPM, VPWR, ALTT V • Generator	2AI
ALTT V (Generator output voltage)	V		Idle (no E/L): Approx. 14 V (This is an internal calculation value and differs from the terminal voltage.)	• Generator	2AJ
APP (Accelerator pedal position)	%		Accelerator pedal is released: 0% Accelerator pedal is depressed: 100%	• The following PIDs: — APP1, APP2 • APP sensor	1Y 1AC

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item	PCM terminal
APP1 (Accelerator pedal position)	%	Accelerator pedal is released: 31.0—32.4% Accelerator pedal is depressed: 69.8—81.8%	• APP sensor	1Y
	V	Accelerator pedal is released: 1.56—1.65 V Accelerator pedal is depressed: 3.65—3.93 V		
APP2 (Accelerator pedal position)	%	Accelerator pedal is released: 20.2—21.4% Accelerator pedal is depressed: 58.8—70.8%	• APP sensor	1AC
	V	Accelerator pedal is released: 1.01—1.10 V Accelerator pedal is depressed: 3.10—3.38 V		
ARPMDES (Target engine speed)	RPM	Shift position: P or N — No load: 700 rpm — E/L operating: 700 rpm — P/S operating: 700 rpm — A/C ON: 700 rpm	• The following PIDs: — IAT, RPM, MAP, ECT, MAF, TP, INGEAR, PSP, ALTT V • CKP sensor	—
BARO (Barometric pressure)	Pa	Ignition switch is ON at sea level: Approx. 101 kPa {1.01 Bar, 14.6psi}	• BARO sensor	—
	V	Ignition switch is ON at sea level: Approx. 4.0 V		
BAT	°C	Boost air temperature is displayed	• MAP/boost air temperature sensor	2N
BAT_V	V	Boost air temperature 20 °C {68 °F}: 2.4—2.6 V	• MAP/boost air temperature sensor	2N
		Boost air temperature 30 °C {86 °F}: 1.7—1.9 V		
BOO (Brake switch)	On/Off	Brake pedal depressed: On Brake pedal released: Off	• Brake switch No.1/No.2	1AB 1AF
BPA (Brake pressure applied switch)	On/Off	Brake pedal depressed: On Brake pedal released: Off	• Brake switch No.1/No.2	1AB 1AF
CATT11_DSD (Estimated catalytic converter temperature)	°C / °F	Indicate the estimated catalytic converter temperature	• Perform applicable DTC troubleshooting.	—
CHRGLP (Generator warning light)	On/Off	Ignition switch to the ON position: On Idle: Off	• Perform applicable DTC troubleshooting.	—
COLP (Refrigerant pressure switch (middle))	ON/OFF	Refrigerant pressure is more than the specification. (Refrigerant pressure switch (middle) is on.): On Refrigerant pressure is less than the specification. (Refrigerant pressure switch (middle) is off.): Off	• Refrigerant pressure switch (middle)	1J
CPP (Clutch pedal position)	On/Off	Clutch pedal depressed: On Clutch pedal released: Off	• CPP switch	1D
CPP/PNP (Shift lever position)	Drive/ Neutral	Neutral position: Neutral Others: Drive	• Neutral switch	1S
DTCCNT (Number of DTC detected)	—	Indicates number of DTC	• Perform applicable DTC troubleshooting.	—
ECT (Engine coolant temperature)	°C / °F	Ignition switch to the ON position: Indicate the ECT	• ECT sensor	2AH
	V	ECT 20 °C {68 °F}: 3.04—3.14 V ECT 60 °C {140 °F}: 1.29—1.39 V		
EQ_RAT11 (Equivalence ratio (lambda))	—	Idling after warm-up: Approx. 1	• Perform applicable DTC troubleshooting.	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item	PCM terminal
EQ_RAT11_DSD (Front oxygen sensor)	—	Idling after warm-up: Approx. 1	• Perform applicable DTC troubleshooting.	—
ETC_ACT (Electronic throttle control actual)	°	Indicate the desired TP by angle	• Perform applicable DTC troubleshooting.	2AK 2AL
ETC_DSD (Electronic throttle control desired)	%	Indicate the desired TP by percent	• The following PIDs: — APP1, APP2, ETC_ACT • TP sensor	2AK 2AL
	°	Indicate the desired TP by angle		
EVAPCP (Purge solenoid valve duty value)	%	Ignition switch to the ON position: 0% Idle: 0%	• The following PIDs: — IAT, RPM, ECT, MAF, O2S11,BARO, INGEAR, VPWR • Purge solenoid valve	2AB
FAN_DUTY	%	ECT less than 98 °C {208 °F}: 0% ECT 100 °C {212 °F}: 30% ECT 106 °C {223 °F}: 70% ECT 110 °C {230 °F}: 100%	• Fan control module	1R 1AE
FIA (Fuel injection amount)	—	Indicate the fuel injection amount.	• Fuel injector • Fuel Injector relay	—
FLI (Fuel level)	%	Fuel gauge level F: Approx. 100% Fuel gauge level E: Approx. 0%	• Perform applicable DTC troubleshooting.	—
FP (Fuel pump relay)	On/Off	Idle: On Cranking: On	• The following PIDs: — RPM • Fuel pump relay	1H
FP_Hi_PRES	On/Off	Spill valve control solenoid valve work: On Spill valve control solenoid valve don't work: Off	• High pressure fuel pump	2F 2G
FUEL_PRES	Pa	Idle: Approx. 3 MPa Load 60 % or more: Approx. 11.5 MPa	• Fuel pressure sensor	2R
FUEL_PRES_V	V	Ignition switch to the ON position: Approx. 1.1 V Idle: Approx. 1.7 V	• Fuel pressure sensor	2R
FUELPW (Fuel injector duration)	sec	Idle: Approx. 2.0 ms	• The following PIDs: — ECT, IAT, RPM, TP, MAF, O2S11, O2S12, MAP, VSS, TR, BOO, AC_REQ, COLP, VPWR	2AZ 2BB 2BC 2BD
FUELSYS (Fuel system status)	OL/CL/ OL-Drive/ OL-Fault/ CL-Fault	Ignition switch to the ON position: OL_Drive Idle (after warm up): CL	• The following PIDs: — IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, PSP, VPWR, ALTT V • Fuel injector	—
GENVDSD (Generator voltage desired)	V	Idle: Approx. 13.83 V (E/L not operating)	• Perform applicable DTC troubleshooting.	—
HTR11 (HO2S heater (front))	On/Off	Idle (after warm up): On⇔Off	• The following PIDs: — IAT, MAF, TP, ECT, RPM	2C
HTR12 (HO2S heater (rear))	On/Off	Idle: On Engine speed is above 4,000 rpm: Off	• The following PIDs: — IAT, MAF, ECT, RPM, ACSW	2D
IAT (Intake air temperature)	°C °F	Ignition switch to the ON position position: Indicate the IAT	• MAF/IAT sensor	1M
	V	IAT 20 °C {68 °F}: 2.4—2.6V IAT 30 °C {86 °F}: 1.7—1.9V		
IMRC (Variable swirl solenoid valve)	On/Off	Engine speed is below Approx. 3,750 rpm and ECT is below 60 °C {140 °F}: On Others: Off	• The following PIDs: — TP, ECT, RPM • Variable swirl solenoid valve	2AS
INGEAR (Load/no load condition)	On/Off	Driving range: On Except above: Off Others: On	• Perform applicable DTC troubleshooting.	—

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item	PCM terminal
IVS (CTP condition)	Idle/ Off Idle	APP closed: Idle Others: Off Idle	• Perform applicable DTC troubleshooting.	2AK 2AL
KNOCKR (Knocking retard)	°	Ignition switch to the ON position: 0 ° Idle: 0 °	• KS	2U 2V
LDP_EVAPCP (EVAP system leak detection pump detect incorrect purge flow)	A	Indicate the EVAP control system incorrect purge flow detection value	• Perform applicable DTC troubleshooting.	—
LDP_IDL (EVAP system leak detection pump idle current)	A	Indicate the EVAP system leak detection pump idle current	• Perform applicable DTC troubleshooting.	—
LDP_MON (EVAP system leak detection pump monitoring current)	A	Indicate the EVAP system leak detection pump monitoring current	• Perform applicable DTC troubleshooting.	—
LDP_REF (EVAP system leak detection pump reference current)	A	Indicate the EVAP system leak detection pump reference current	• Perform applicable DTC troubleshooting.	—
LDP_SLDV (EVAP system small leak detection value)	A	Indicate the EVAP control system small leak detection value	• Perform applicable DTC troubleshooting.	—
LDP_VSL_FV*1 (EVAP system very small leak detection fail value)	mA/sec	Indicate EVAP system very small leak detection fail value	• Perform applicable DTC troubleshooting.	—
LDP_VSL_SV*1 (EVAP system very small leak detection safe value)	mA/sec	Indicate EVAP system very small leak detection safe value	• Perform applicable DTC troubleshooting.	—
LDP_VSLDV*1 (EVAP system small leak detection value)	mA/sec	Indicate the EVAP control system vary small leak detection value	• Perform applicable DTC troubleshooting.	—
LOAD (Engine load)	%	Ignition switch to the ON position: 0% Idle (after warm up): 17.1—18.5% Engine speed is 2,500 rpm: 14.2—15.2	• MAF/IAT sensor	—
LONGFT1 (long term fuel trim)	%	Idle (after warm up):–14—14%	• Perform applicable DTC troubleshooting.	—
MAF (Mass airflow)	g/sec	Ignition switch to the ON position: Approx. 0 g/s Idle (after warm up): 2.72—2.94 g/s Engine speed is 2,500 rpm: 8.00—8.66	• MAF/IAT sensor	1AK
	V	Ignition switch to the ON position: Approx. 0.7 V Idle (after warm up): Approx. 1.3 V		
MAP (Manifold absolute pressure)	Pa	Ignition switch to the ON position: Indicate the atmospheric pressure	• MAP sensor	2AG
	V	Ignition switch to the ON position: Approx. 1.9 V Idle (after warm up): Below 1.0 V		
MIL (Malfunction indicator lamp)	On/Off	Ignition switch to the ON position: On Idle: Off	• Perform applicable DTC troubleshooting.	—
MIL_DIS (Traveled distance since the MIL illuminated)	km / mile	No DTC: 0 km {0 mile} DTC detected: Not 0 km {0 mile}	• Perform applicable DTC troubleshooting.	—
O2S11 (Front oxygen sensor)	A	Idle (after warm up): –1.0—1.0 A Deceleration (after warm up): 0.25 A or more	• HO2S (front)	2Z 2AC 2AD

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item	PCM terminal
O2S12 (Rear oxygen sensor)	V	Idle: 0—1 V	• HO2S (rear)	2Q
PSP (Power steering pressure switch)	High/Low	Steering wheel in straight ahead position: Low Others: High	• PSP switch	2T
RO2FT1 (Rear oxygen sensor fuel trim)	—	• Idle after warm-up: Approx. 0.2	• The following PID — O2S12	2Q
RPM (Engine speed)	RPM	No load: 650—750 rpm E/L operating: 650—750 rpm P/S operating: 650—750 rpm A/C ON: 650—750 rpm	• CKP sensor	2W
SCCS (Speed control command switch)	V	Press ON/OFF: Approx. 0 V Press CANCEL: Approx. 1.1 V Press SET/COAST: Approx. 3.1 V Press RES/ACCEL: Approx. 4.2 V Others: Approx. 5.0 V	• Cruise control switch	1AQ
SEGRP (EGR valve (stepping motor) position)	—	Idle: 0 step Cranking: 0—60 steps	• The following PIDs: — MAF, TP, ECT, RPM, VSS • EGR valve	—
SEGRP DSD (Desired EGR valve (stepping motor) position)	%	Idle: 0%	• The following PIDs: — MAF, TP, ECT, RPM, VSS	—
SHRTFT1 (Short term fuel trim [front HO2S])	%	Idle (after warm up): Approx.–30—25%	• Perform applicable DTC troubleshooting.	—
SHRTFT12 (Short term fuel trim)	%	Idle (after warm up): Approx.–30—25%	• Perform applicable DTC troubleshooting.	—
SPARKADV (Ignition timing)	°	Idle: BTDC Approx. 10°	• The following PIDs: — MAF, TP, ECT, RPM, INGEAR, PSP, ACSW, VPWR • Ignition timing	—
test (Test mode)	On/Off	—	—	—
TIRESIZE (Tire revolution per mile)	rev/mile	Indicate the tire circumference length	—	—
TP REL (Relative TP)	%	Ignition switch to the ON position APP is released: Approx. 5% APP is depressed: Approx. 46 %	• TP sensor	2AK 2AL
TP1 (TP sensor 1)	%	Ignition switch to the ON position APP is released: Approx. 15% APP is depressed: Approx. 55 %	• TP sensor	2AK
	V	Ignition switch to the ON position APP is released: 0.4—0.6 V APP is depressed: 4.7—4.9 V		
TP2 (TP sensor 2)	%	Ignition switch to the ON position APP is released: Approx. 15% APP is depressed: Approx. 56%	• TP sensor	2AL
	V	Ignition switch to the ON position APP is released: 4.4—4.6 V APP is depressed: 0.1—0.3 V		
TPCT (Lowest closed throttle voltage)	V	Ignition switch to the ON position: Approx 1.0 V	• TP sensor	2AK 2AL
VPWR (Battery positive voltage)	V	Indicate the battery voltage	• Battery	1BA
Vref (Battery voltage)	V	Indicate the battery voltage	• Battery	1BA
VSS (Vehicle speed)	KPH / MPH	Indicate the vehicle speed	• Perform applicable DTC troubleshooting.	—
VT ACT1 (Actual valve timing)	°	Idle: Approx. 0°	• The following PIDs: — TP, ECT, RPM • OCV	—

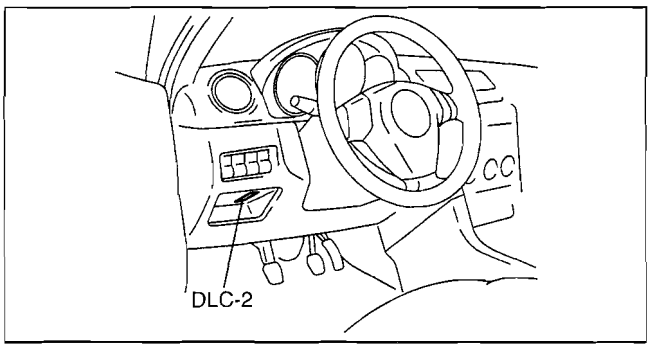
Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Inspection item	PCM terminal
VT DIFF1 (Difference between actual valve timing and target valve timing)	°	Idle: Approx. 0°	• The following PIDs: — TP, ECT, RPM • OCV	2AF
VT DUTY1	%	Idle: Approx. 11.5%	• The following PIDs: — TP, ECT, RPM • OCV	2AF
VTC	On/Off	Variable swirl shutter valve switch ON: On	• Variable swirl shutter valve switch	2AE
		Variable swirl shutter valve switch OFF: Off		
WGC	%	Racing with the accelerator pedal fully depressed: 10—100 %	• Wastegate control solenoid valve	2AA
		Fully closed: 0 %		

*1 : California emission regulation applicable model

PCM CONFIGURATION[L3 WITH TC]

id014039802600

1. Connect the M-MDS to DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module Programming".
3. Then, select the "Programmable Module Installation" and "PCM" from the screen menu.
4. Select "Programmable Parameters". [with DSC HU/CM]
5. Select "Tire Size / Axle Ratio". [with DSC HU/CM]
6. Select "Body Type - (PCM)", then select the applicable body type on the M-MDS screen. [with DSC HU/CM]
7. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection.



am3zzw0000046

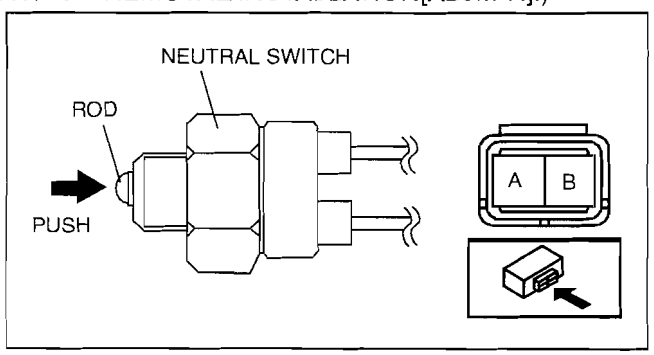
NEUTRAL SWITCH INSPECTION[L3 WITH TC]

id014039800800

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart.

Continuity Inspection

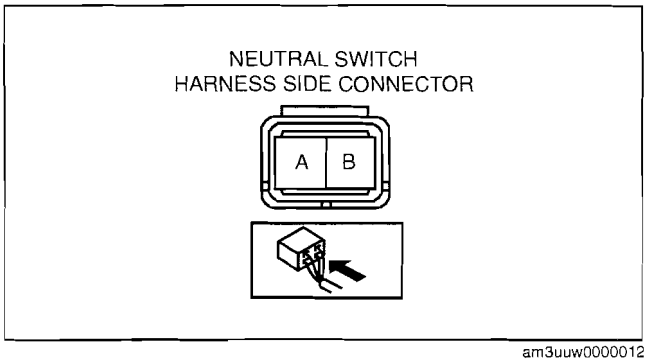
1. Remove the neutral switch. (See 05-15B-3 NEUTRAL SWITCH REMOVAL/INSTALLATION[A26M-R].)
2. Verify that the continuity between neutral switch terminals A and B is as indicated in the table.
   - If it can be verified, perform the "Circuit Open/ Short Inspection".
   - If it cannot be verified, replace the neutral switch.



am3uuw0000012

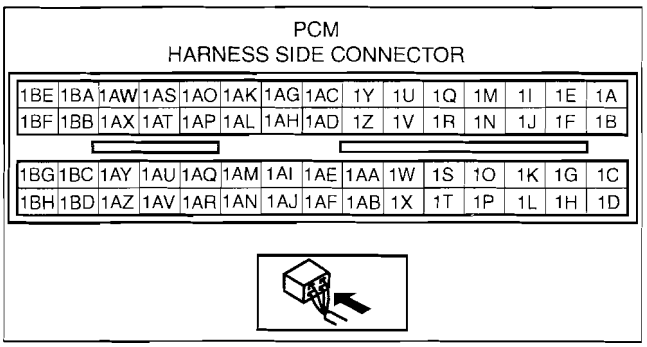
Measured condition	Continuity
Rod pushed	Continuity detected
Except above	No continuity

Circuit Open/Short Inspection



am3uuw0000012

1. Disconnect the PCM connector.
2. Inspect the following wiring harness for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - Neutral switch terminal A and PCM terminal 1S
  - Neutral switch terminal B and body ground

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Neutral switch terminal B and ground

CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION[L3 WITH TC]

id014039801600

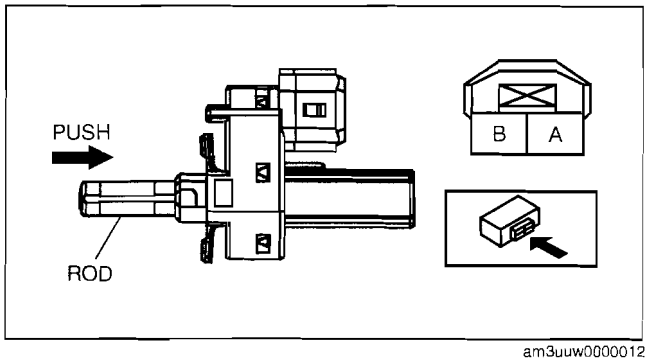
Note

- Before performing the following inspection, make sure to follow the troubleshooting flowchart. (See 01-03A-10 FOREWORD[LF, L3].)

Continuity Inspection

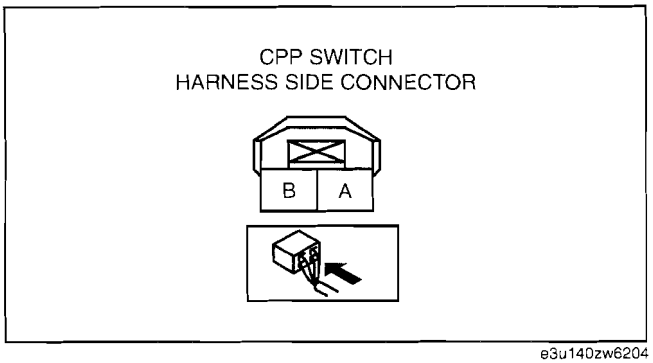
1. Remove the CPP switch.
2. Verify that the continuity between CPP switch terminals A and B is as indicated in the table.
   - If there is no malfunction, perform the "Circuit Open/Short Inspection".
   - If there is any malfunction, replace the CPP switch.

Measurement condition	Continuity
Push the rod.	No continuity
Except above	Continuity detected



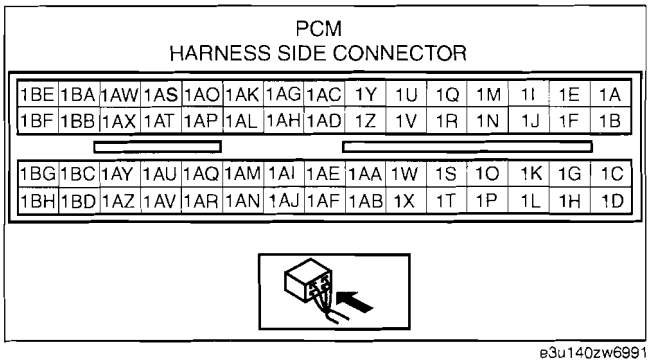
am3uuw0000012

Circuit Open/Short Inspection



e3u140zw6204

1. Disconnect the PCM connector.
2. Disconnect the CPP switch connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



e3u140zw6991

Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - CPP switch terminal A and PCM terminal 1D
  - CPP switch terminal B and body ground

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - CPP switch terminal A and body ground
  - CPP switch terminal A and power supply
  - CPP switch terminal B and power supply

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION[L3 WITH TC]

id014039803100

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Continuity Inspection

1. Inspect the following if the power steering is inoperative (See06-14-4 POWER STEERING FLUID INSPECTION.):
   - Power steering fluid level
   - Power steering fluid leakage
   - Power steering fluid pressure
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between the PSP switch terminal and ground using a tester.
   - If not as specified, replace the PSP switch. (See06-14-23 POWER STEERING OIL PUMP REMOVAL/ INSTALLATION[L3 WITH TC].)
   - If the PSP switch is normal, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

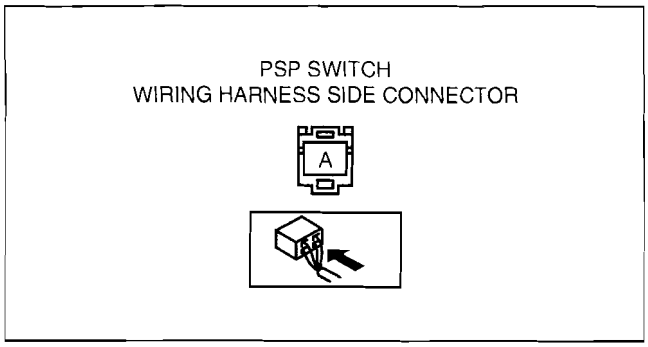
Specification

○—○ : Continuity

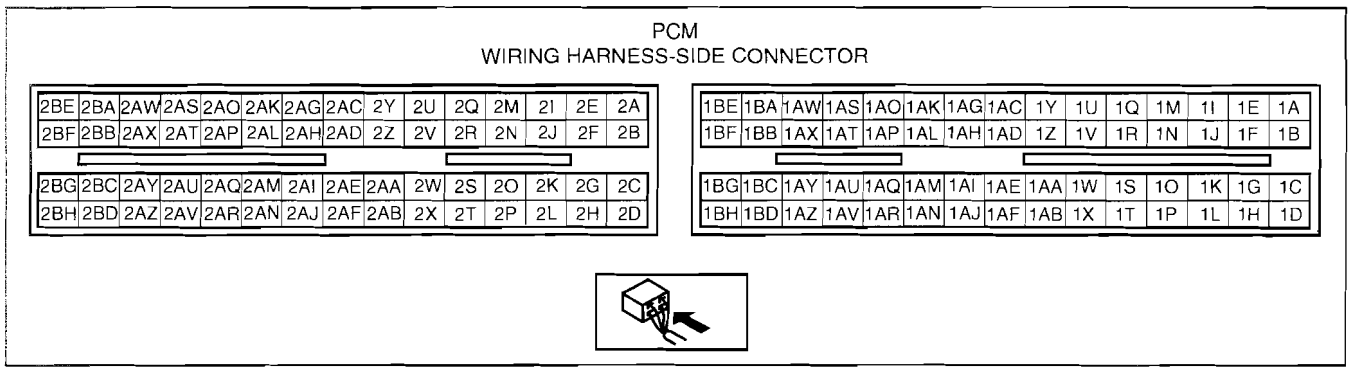
Condition	Terminal	GND
Steering wheel in straight ahead position		
While turning steering wheel	○	○

acxuuw00000116

Circuit Open/Short Inspection



acxuuw00000117



acxuuw00000118

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — PSP switch terminal and PCM terminal 2T

Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the wiring harness.
  — PSP switch terminal and body ground

VARIABLE SWIRL SHUTTER VALVE SWITCH INSPECTION[L3 WITH TC]

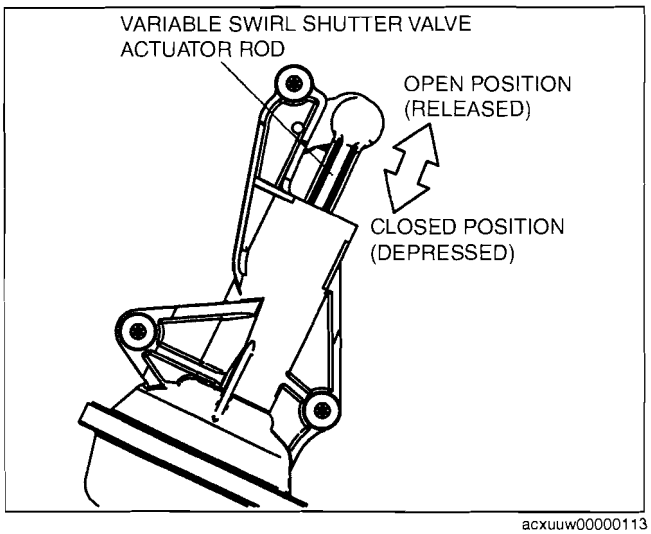
id014039803000

Note

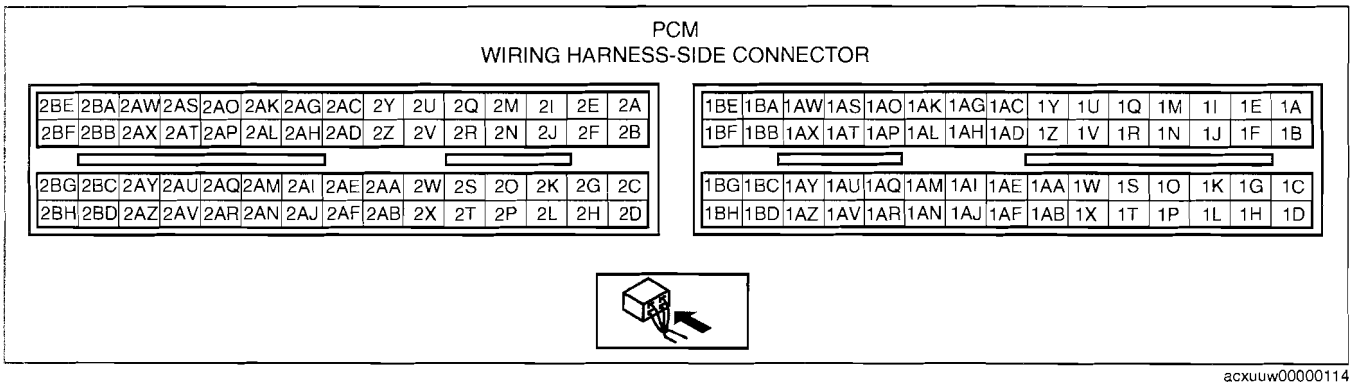
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See00-00-3 HOW TO USE THIS MANUAL.)

Voltage Inspection

1. Turn the ignition switch to the ON position (Engine off).
2. Verify that the PCM terminal 2AE voltage is as shown in the following table when the variable swirl shutter valve actuator rod is depressed and released by hand.



acxuuw00000113



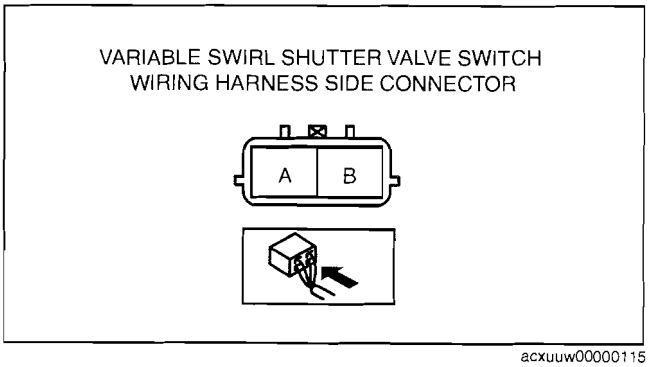
acxuuw00000114

- If not as specified, perform the "Circuit Open/Short Inspection".
  - — If there is no open or short circuit, replace the intake manifold. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)

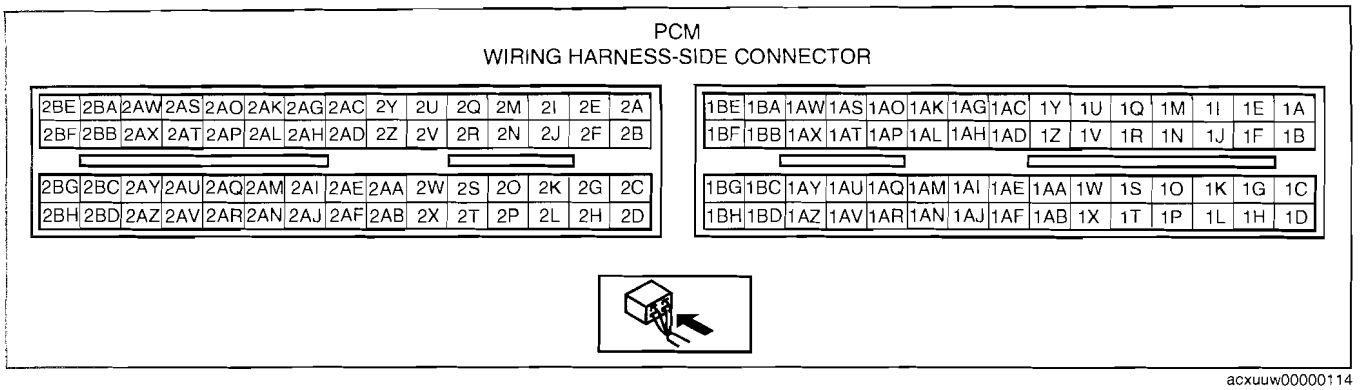
Variable swirl shutter valve switch output voltage

Condition	PCM terminal 2AE
Released (Open position)	B+
Depressed (Closed position)	Below 1.0 V

Circuit Open/Short Inspection



acxuuw00000115



acxuuw00000114

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Variable swirl shutter valve switch terminal A and PCM terminal 2AE
  - — Variable swirl shutter valve switch terminal B and body ground.

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Variable swirl shutter valve switch terminal A and power supply
  - — Variable swirl shutter valve switch terminal A and body ground
  - — Variable swirl shutter valve switch terminal B and power supply

ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[L3 WITH TC]

id0140398019OO

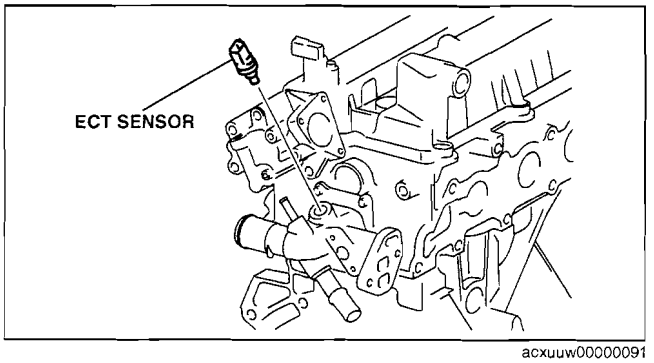
Warning

- **A hot engine can cause severe burns. Turn off the engine and wait until it is cool before removing the ECT sensor.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the air cleaner and air hose. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Drain the engine coolant. (See01-12B-3 COOLING SYSTEM SERVICE WARNINGS[L3 WITH TC].)
6. Disconnect the wiring harness.
7. Remove the ECT sensor.
8. Install in the reverse order of removal.

Tightening torque
10—14 N·m {102—142 kgf·cm, 89—123 in·lbf}

9. Refill the engine coolant. (See01-12B-3 COOLING SYSTEM SERVICE WARNINGS[L3 WITH TC].)



acxuuw00000091

ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION[L3 WITH TC]

id014039802000

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

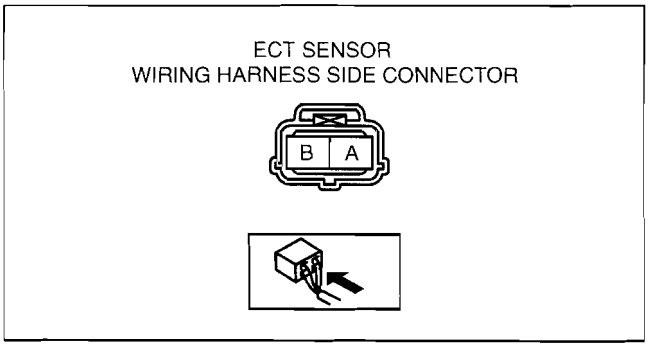
ECT Sensor Resistance Inspection

1. Drain the engine coolant. (See01-12B-3 COOLING SYSTEM SERVICE WARNINGS[L3 WITH TC].)
2. Remove the ECT sensor (located above the starter).
3. Place the ECT sensor in water with a thermometer, and heat the water gradually.
4. Measure the resistance between the ECT sensor terminals A and B using a tester.
   - If not as specified, replace the ECT sensor.
   - If the ECT sensor is normal, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

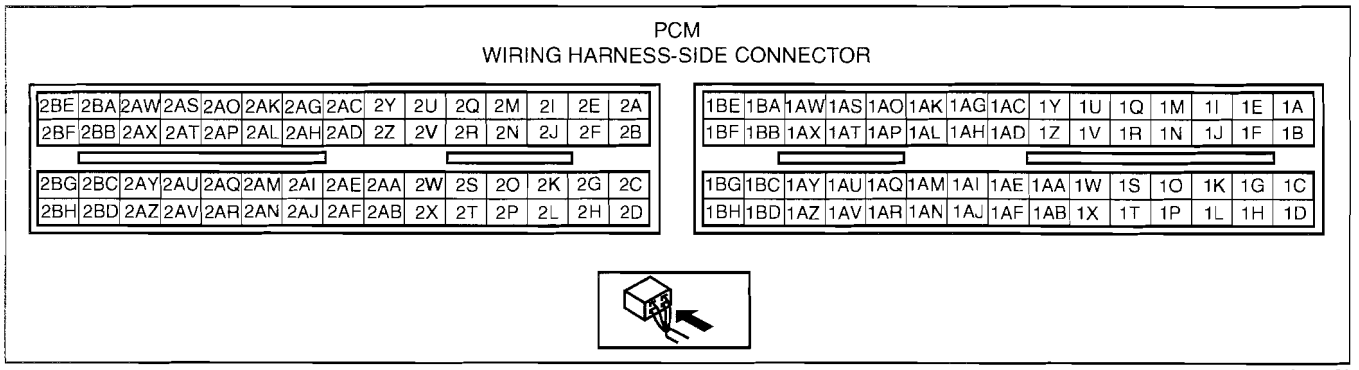
Specification

Water temperature (°C {°F})	Resistance (kilohm)
20 {68}	35.48—39.20
80 {176}	3.65—4.02

Circuit Open/Short Inspection



acxuuw00000092



acxuuw00000093

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A and PCM terminal 2AH
  - — ECT sensor terminal B and PCM terminal 2AY

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — ECT sensor terminal A and power supply
  - — ECT sensor terminal A and body ground
  - — ECT sensor terminal B and power supply

MASS AIR FLOW (MAF) SENSOR INSPECTION[L3 WITH TC]

id014039800700

Visual Inspection

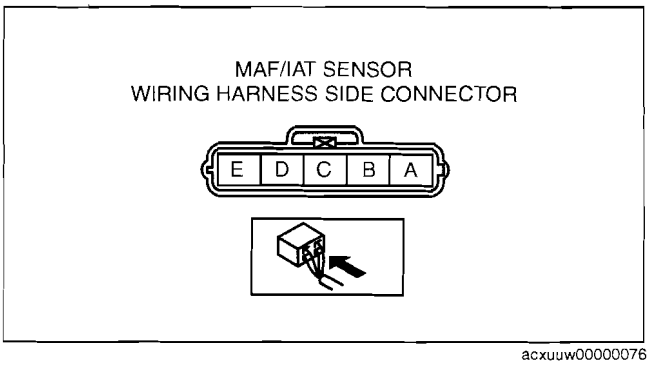
Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

1. Visually inspect for the following on the MAF sensor. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/ INSTALLATION[L3 WITH TC].)
   - Damage
   - Cracks
   - Bent terminals
   - Terminal rust
     - — If any of the above are found, replace the MAF/IAT sensor.
     - — If the monitor item status/specification (reference) is not within the specification even though there is no malfunction, perform the "Circuit Open/Short Inspection".

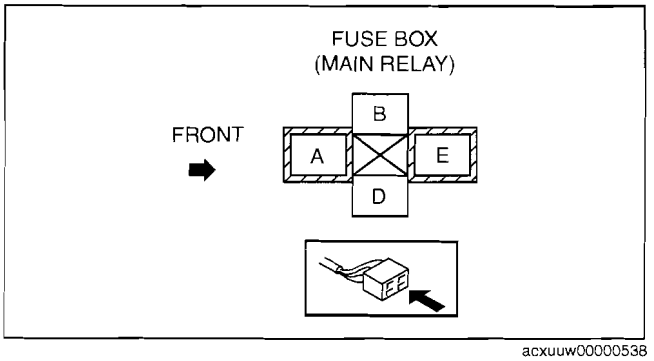
Voltage Inspection

1. Remove the MAF/IAT sensor without disconnect the MAF/IAT sensor connector.
2. Turn the ignition switch to the ON position.
3. As the air gradually approaches the MAF detection part of the MAF/IAT sensor, verify that the voltage at PCM terminal 1AK (M-MDS PID: MAF) varies.
   - If it cannot be verified even though the related harnesses have no malfunction, replace the MAF/IAT sensor.

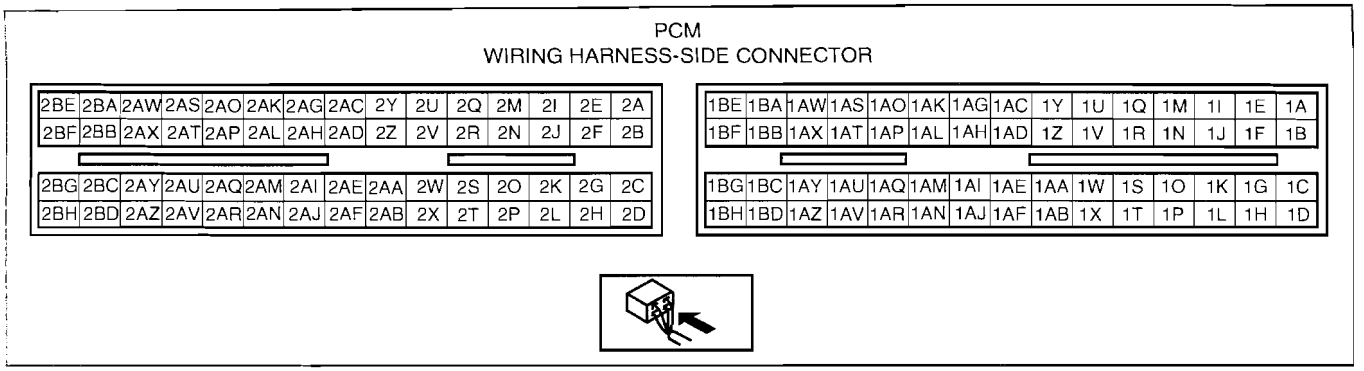
Circuit Open/Short Inspection



acxuuw00000076



acxuuw00000538



acxuuw00000078

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the MAF/IAT sensor connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal A and main relay terminal A
  - — MAF/IAT sensor terminal B and PCM terminal 1P
  - — MAF/IAT sensor terminal C and PCM terminal 1AK

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal A and body ground
  - — MAF/IAT sensor terminal B and power supply
  - — MAF/IAT sensor terminal C and power supply
  - — MAF/IAT sensor terminal C and body ground

INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION[L3 WITH TC]

id014039802200

Resistance Inspection

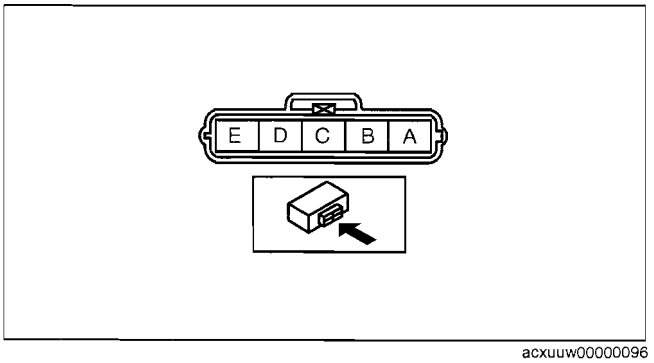
Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

1. Disconnect the MAF/IAT sensor.
2. Measure the resistance between the MAF/IAT sensor terminals D and E using a tester.
   - If not as specified, replace the MAF/IAT sensor. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   - If the MAF/IAT sensor is normal, but the PID is out of specification, perform the "Circuit Open/Short Inspection".

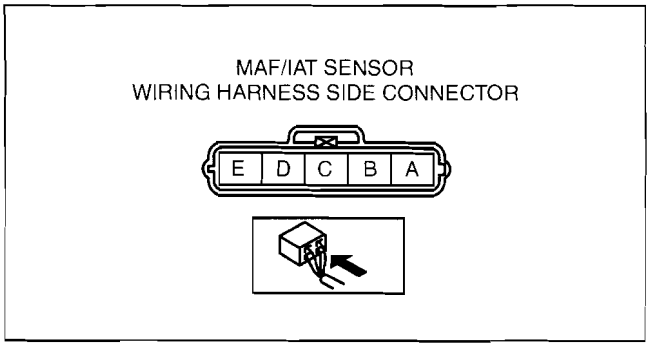
Specification

Ambient temperature (°C {°F})	Resistance (kilohm)
20 {68}	2.21—2.69
60 {140}	0.493—0.667

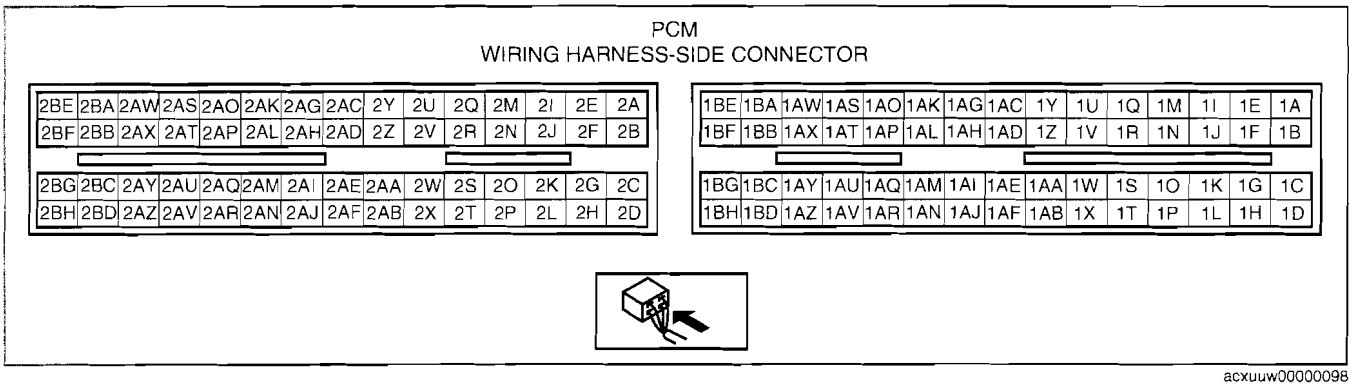


acxuuw00000096

Circuit Open/Short Inspection



acxuuw00000097



acxuuw00000098

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal D and PCM terminal 1M
  - — MAF/IAT sensor terminal E and PCM terminal 1AR

Short circuit

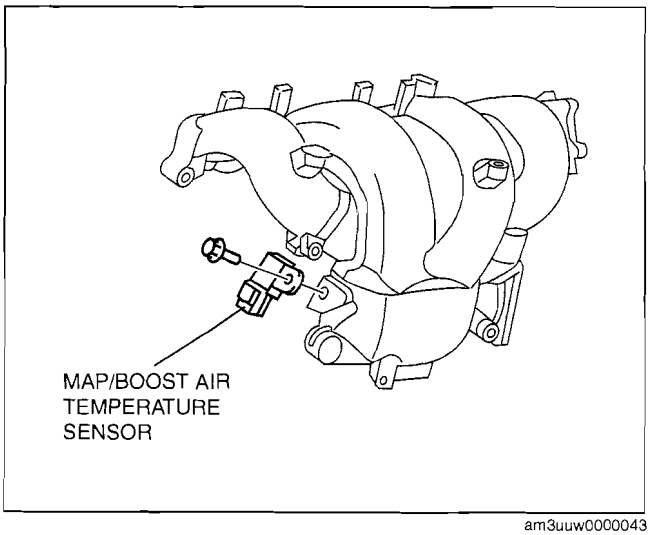
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — MAF/IAT sensor terminal E and power supply
  - — MAF/IAT sensor terminal D and power supply
  - — MAF/IAT sensor terminal D and body ground

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/BOOST AIR TEMPERATURE SENSOR REMOVAL/ INSTALLATION[L3 WITH TC]

id014039801000

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the oil level gauge pipe. (See01-11B-5 OIL PAN REMOVAL/INSTALLATION[L3 WITH TC].)
4. Disconnect the MAP/boost air temperature sensor connector.
5. Remove MAP/boost air temperature sensor from the intake manifold.
6. Install in the reverse order of removal.

Tightening torque
5.0—7.0 N·m {51—71 kgf·cm, 45—61 in·lbf}



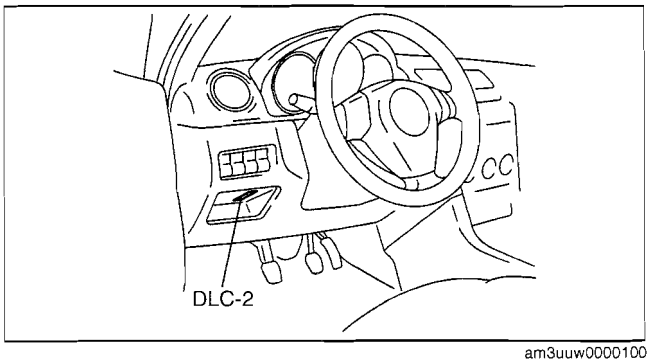
am3uuw0000043

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION[L3 WITH TC]

id014039800900

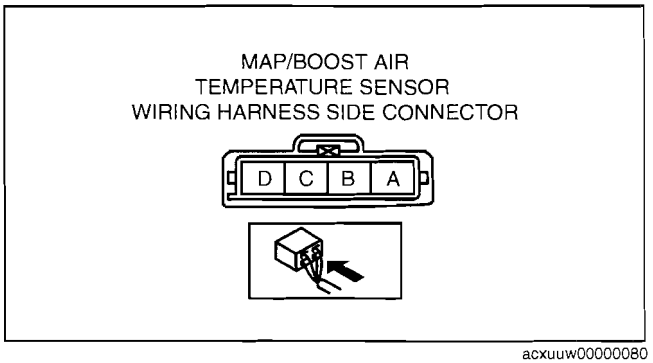
Note
- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the MAP sensor.

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to ON (Engine off).
3. Select MAP PID on the M-MDS.
4. Verify that the MAP PID (pressure) and barometric pressure are practically equal.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the MAP sensor.
   - If as verified, go to next step.
5. Apply vacuum of**–25.0 kPa {–187 mmHg, –7.38 inHg}** to the MAP sensor, and verify that the MAP variation from that of Step 4 is**approx. 25.0 kPa {187 mmHg, 7.38 inHg}**.
   - If not as verified, perform the "Circuit Open/Short inspection".
     — If there is no open or short circuit, replace the barometric pressure sensor. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)

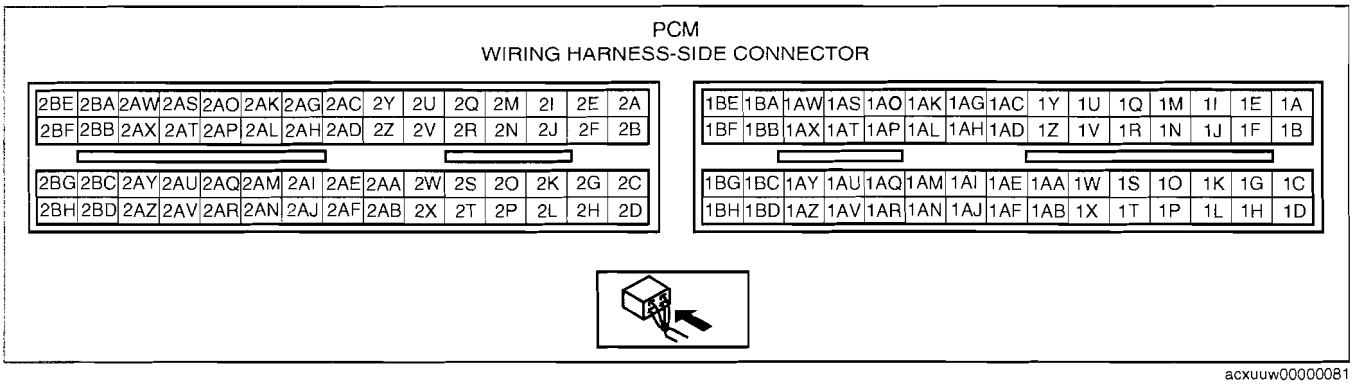


am3uuw0000100

Circuit Open/Short Inspection



acxuuw00000080



acxuuw00000081

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit
- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  — MAP/boost air temperature sensor terminal A and PCM terminal 2AV
  — MAP/boost air temperature sensor terminal C and PCM terminal 2AU
  — MAP/boost air temperature sensor terminal D and PCM terminal 2AG

Short circuit
- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  — MAP/boost air temperature sensor terminal A and power supply.
  — MAP/boost air temperature sensor terminal C and body ground.
  — MAP/boost air temperature sensor terminal D and power supply.
  — MAP/boost air temperature sensor terminal D and body ground

BOOST AIR TEMPERATURE SENSOR INSPECTION[L3 WITH TC]

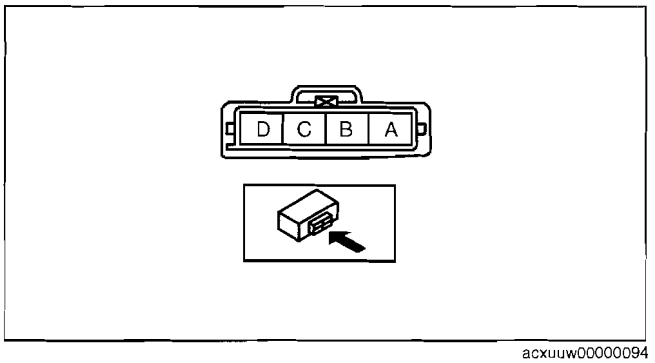
id014039802100

Resistance Inspection

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

1. Disconnect MAP/boost air temperature sensor.
2. Measure the resistance between the MAP/boost air temperature sensor terminals A and B using a tester.
   - If not as specified, replace the MAP/boost air temperature sensor. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   - If the MAP/boost air temperature sensor is normal, but PID are out of specification, perform the "Circuit Open/Short Inspection".

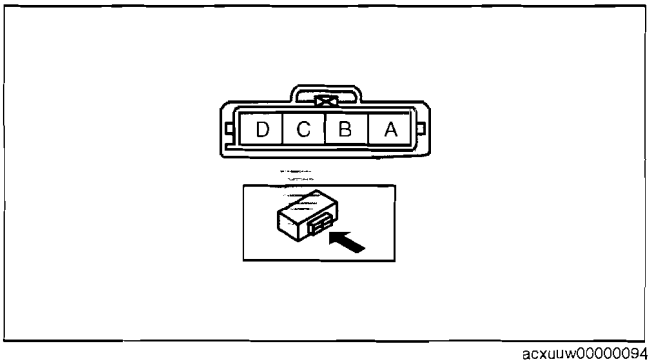


acxuuw00000094

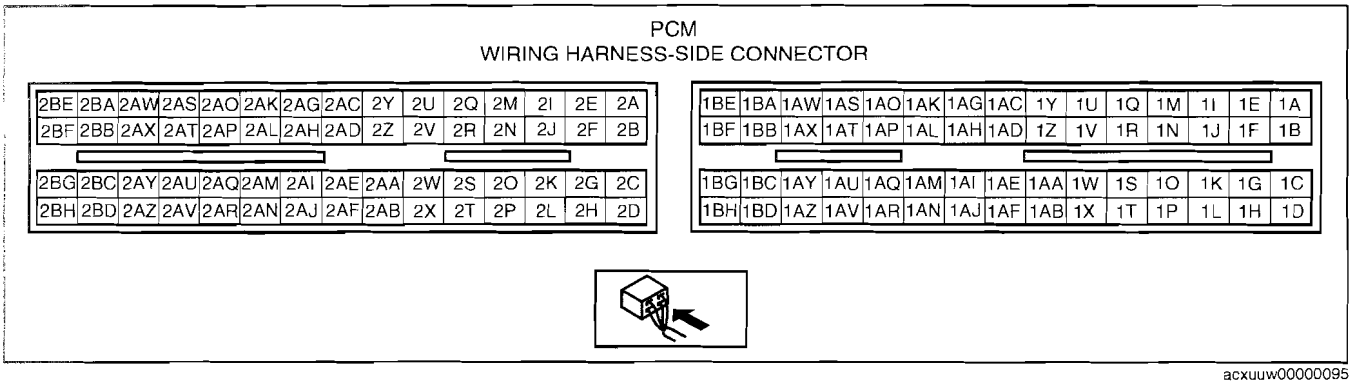
Specification

Ambient temperature (°C {°F})	Resistance (kilohm)
20 {68}	2.4—2.7
60 {140}	0.59—0.64

Circuit Open/Short Inspection



acxuuw00000094



acxuuw00000095

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - MAP/boost air temperature sensor terminal A and PCM terminal 2AV
  - MAP/boost air temperature sensor terminal B and PCM terminal 2N
  - MAP/boost air temperature sensor terminal C and PCM terminal 2AU

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - MAP/boost air temperature sensor terminal A and power supply
  - MAP/boost air temperature sensor terminal B and power supply
  - MAP/boost air temperature sensor terminal B and body ground
  - MAP/boost air temperature sensor terminal C and body ground

THROTTLE POSITION (TP) SENSOR INSPECTION[L3 WITH TC]

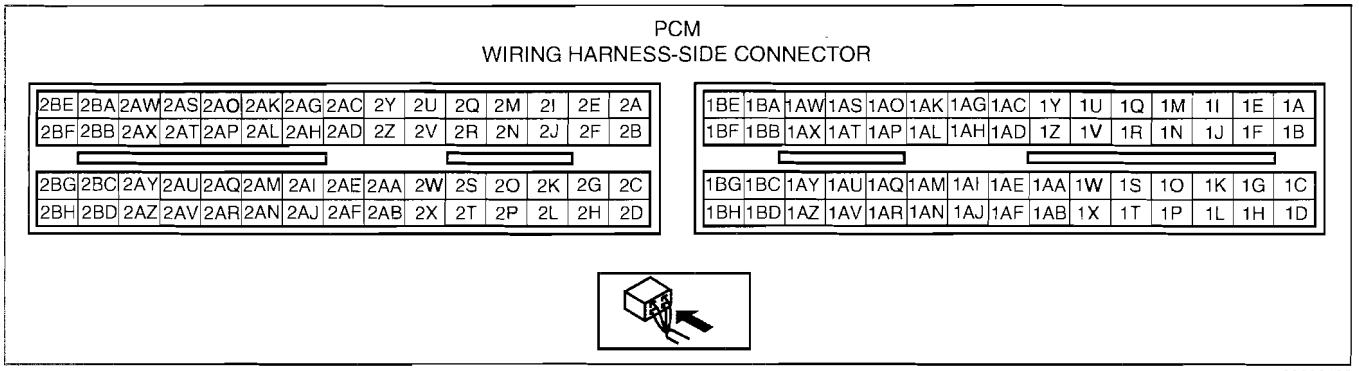
id014039802700

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Voltage Inspection

1. Verify that no DTC related to the APP sensor has been detected.
   - If any DTCs related to the APP sensor have been detected, perform the DTC inspection. (See01-02B-14 DTC TABLE[L3 WITH TC].)
2. Start the engine and warm it up (ECT: **more than 80°C {176 °F}).**
3. Turn the ignition switch to the ON position (Engine off).
4. Verify that the PCM terminal 2AK and 2AL change smoothly while the throttle valve is gradually opened.
   - If as verified, go to next step.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the throttle body.
5. Verify that the PCM terminal 2AK and 2AL voltages are as shown in the following table.

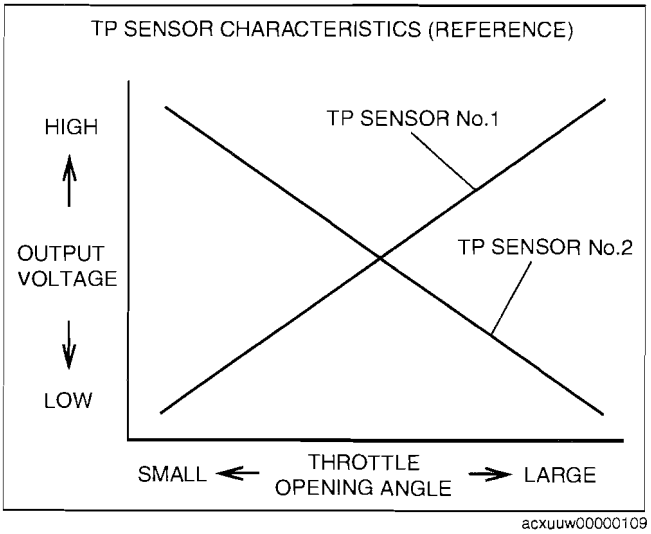


acxuuw00000108

- If the voltage is not according to the following table, perform the "Circuit Open/Short Inspection".
  — If there is no open or short circuit, replace the throttle body.

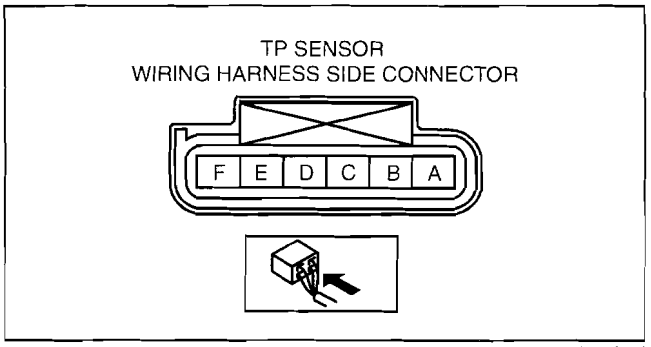
TP sensor output voltage

Condition	PCM terminal 2AK (TP sensor No.1)	PCM terminal 2AL (TP sensor No.2)
APP is released	0.4—0.6 V	4.4—4.6 V
APP is depressed	4.7—4.9 V	0.1—0.3 V

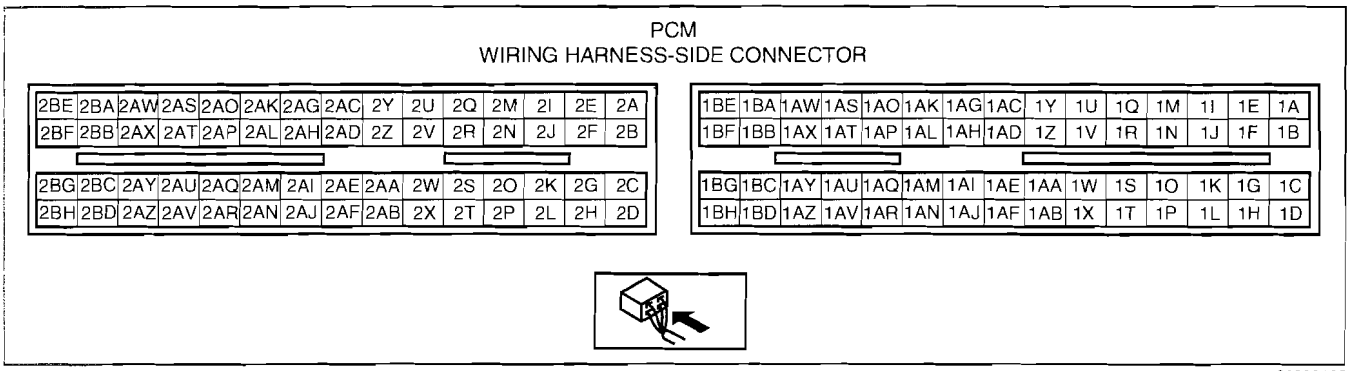


acxuuw00000109

Circuit Open/Short Inspection



acxuuw00000110



acxuuw00000108

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Throttle body terminal A and PCM terminal 2AK
  - — Throttle body terminal B and PCM terminal 2AO
  - — Throttle body terminal C and PCM terminal 2AL
  - — Throttle body terminal D and PCM terminal 2AP

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — Throttle body terminal A and power supply
  - — Throttle body terminal A and body ground
  - — Throttle body terminal B and body ground
  - — Throttle body terminal C and power supply
  - — Throttle body terminal C and body ground
  - — Throttle body terminal D and power supply

ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION[L3 WITH TC]

id014039803200

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Voltage Inspection

1. Turn the ignition switch to the ON position (Engine off).
2. Verify that the PCM terminal 1Y and 1AC change smoothly while throttle valve is gradually opened.
   - If as verified, go to next step.
   - If not as verified, perform the "Circuit Open/Short Inspection".
     — If there is no open or short circuit, replace the throttle body. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
3. Verify that the PCM terminal 1Y and 1AC voltages are as shown in the following table.

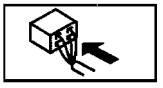
PCM
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B

2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J		1B

1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

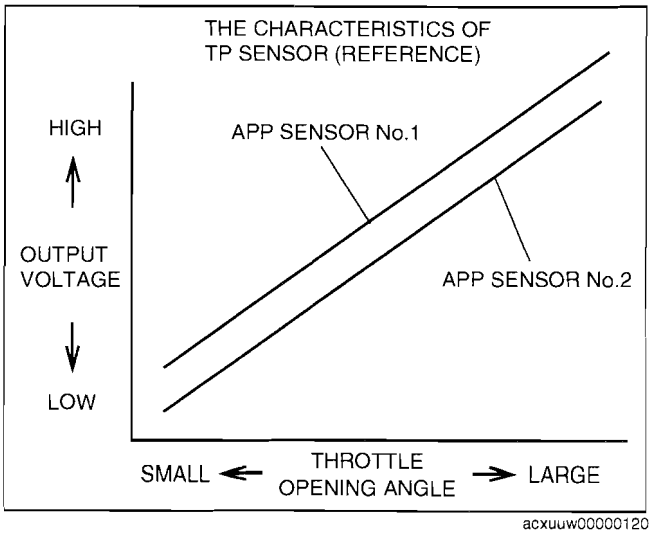


acxuuw00000119

- If the voltage is not according to the following table, perform the "Circuit Open/Short Inspection".
  — If there is no open or short circuit, replace accelerator pedal. (See01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)

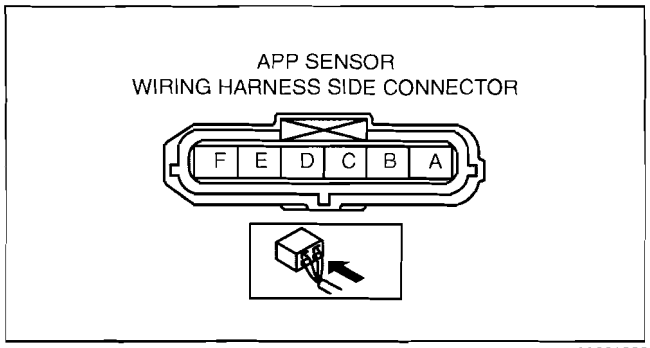
APP sensor output voltage

Condition	PCM terminal 1Y (APP sensor No.1)	PCM terminal 1AC (APP sensor No.2)
APP is depressed	3.65—3.93 V	3.10—3.38
APP is released	1.56—1.65V	1.01—1.10

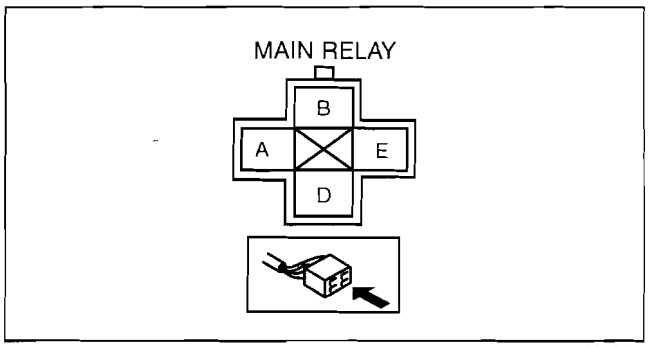


acxuuw00000120

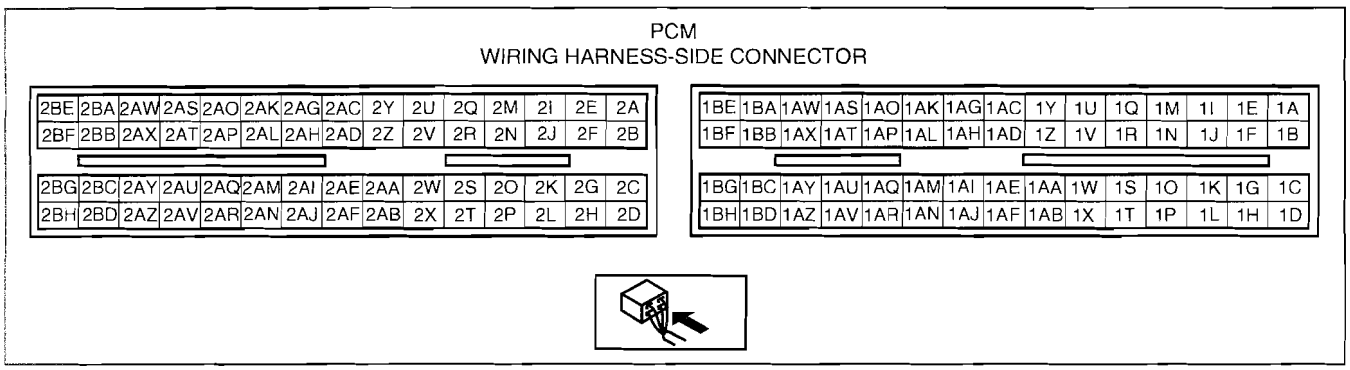
Circuit Open/Short Inspection



acxuuw00001926



am3uuw0000100



acxuuw00000119

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — APP sensor terminal A and PCM terminal 1AJ
  - — APP sensor terminal B and PCM terminal 1Y
  - — APP sensor terminal C and PCM terminal 1AV
  - — APP sensor terminal D and PCM terminal 1U
  - — APP sensor terminal E and PCM terminal 1AC
  - — APP sensor terminal F and main relay terminal A

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - — APP sensor terminal A and body ground
  - — APP sensor terminal B and power supply
  - — APP sensor terminal C and power supply
  - — APP sensor terminal C and body ground
  - — APP sensor terminal D and body ground
  - — APP sensor terminal E and power supply
  - — APP sensor terminal F and power supply
  - — APP sensor terminal F and body ground

FUEL PRESSURE SENSOR REMOVAL/INSTALLATION[L3 WITH TC]

id014039801200

Note

- If the fuel pressure sensor is removed, do not reuse the fuel pressure sensor and the fuel delivery pipe. When you replace the fuel pressure sensor, replace a new fuel delivery pipe with a new fuel pressure sensor. (SEE 01-14B-30 FUEL INJECTOR REMOVAL/INSTALLATION[L3 WITH TC].)

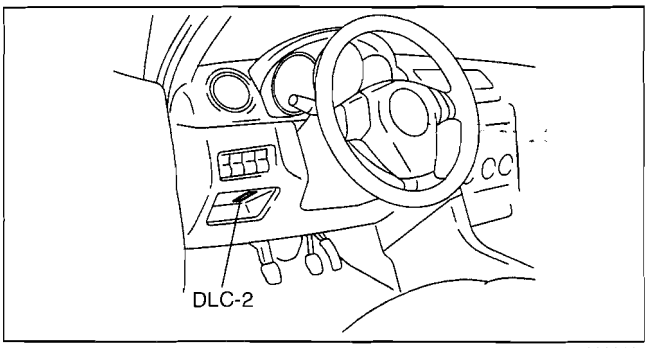
FUEL PRESSURE SENSOR INSPECTION[L3 WITH TC]

id014039801300

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).
3. Select the FUEL_PRES PID on the M-MDS.
4. After warming up the engine, verify that the FUEL_PRES PID is at the standard value under the following conditions.
   — If not as verified, replace the fuel delivery pipe.

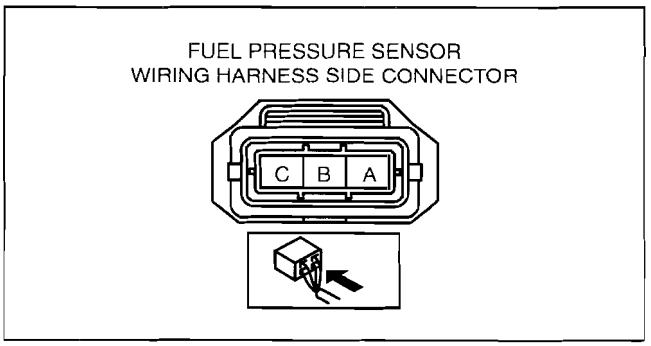


am3uuw0000100

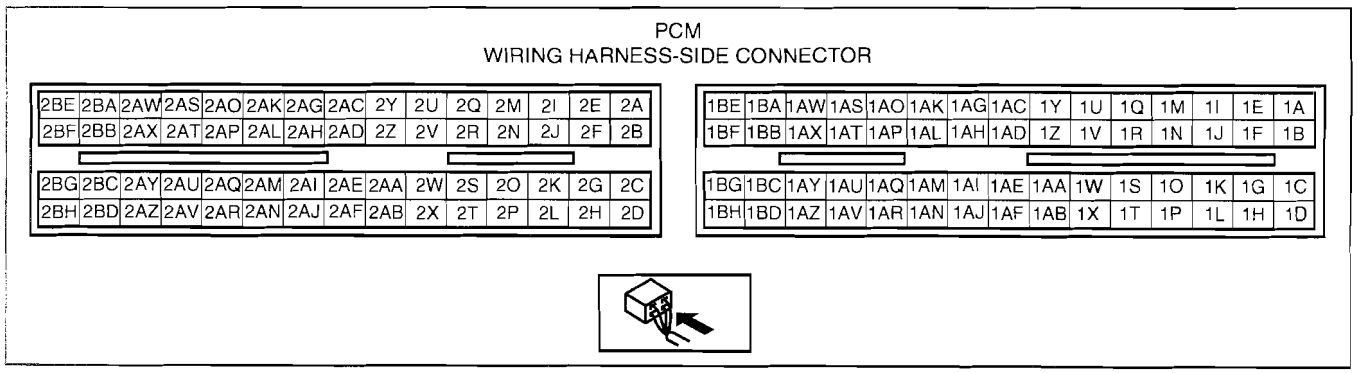
Step	Condition	FUEL_PRES PID
1	• Idle • 90 s after engine is started	Approx. 3 MPa
2	• Idle • Spill valve solenoid valve connector is disconnected	Approx. 530 kPa

5. After connecting the spill valve control solenoid valve connector, clear the DTC.

Circuit Open/Short Inspection



acxuuw00000085



acxuuw00000086

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Fuel pressure sensor terminal A and PCM terminal 2P
  - Fuel pressure sensor terminal B and PCM terminal 2R
  - Fuel pressure sensor terminal C and PCM terminal 2I

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Fuel pressure sensor terminal A and power supply.
  - Fuel pressure sensor terminal B and power supply.
  - Fuel pressure sensor terminal B and body ground.
  - Fuel pressure sensor terminal C and body ground

HEATED OXYGEN SENSOR (HO2S) INSPECTION[L3 WITH TC]

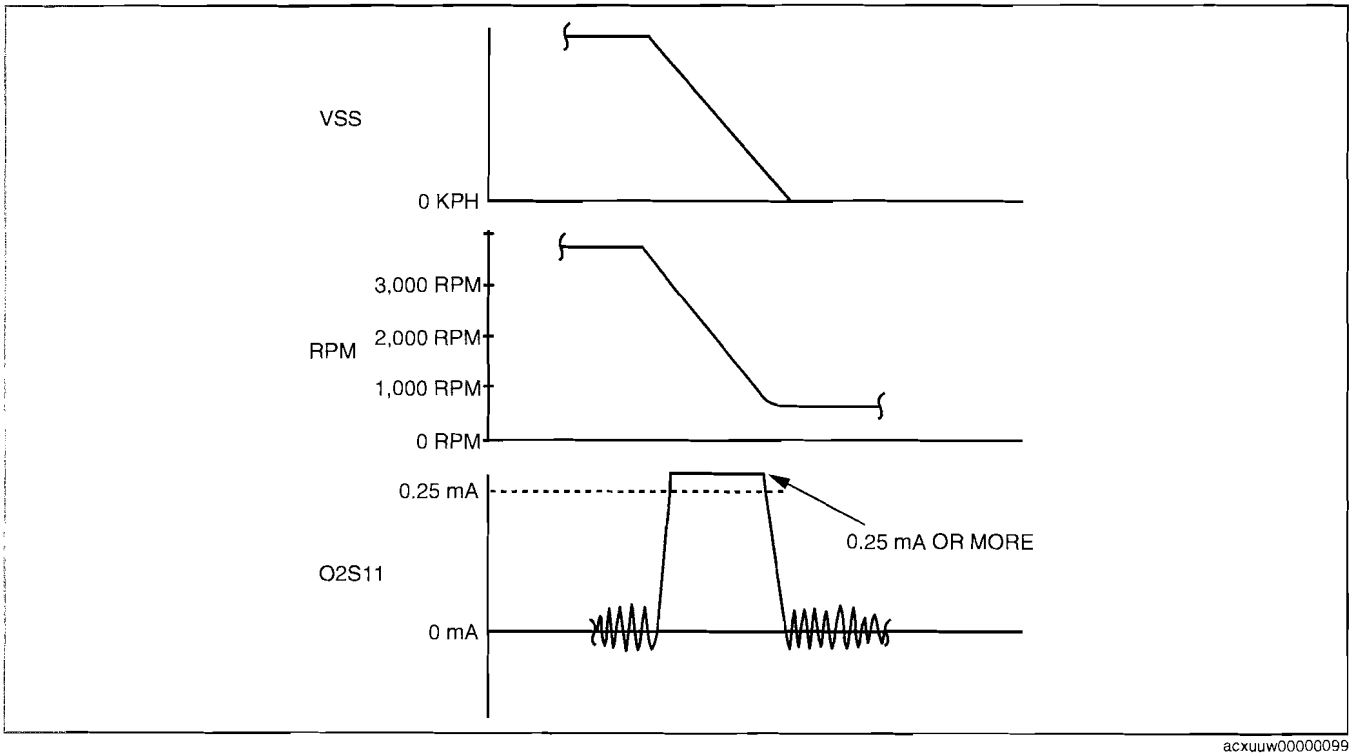
id014039802300

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Front HO2S Current Inspection

1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   - Vehicle speed (PID: VSS)
   - Engine speed (PID: RPM)
   - Front HO2S current (PID: O2S11)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more.**
4. Verify that the front HO2S current (PID: O2S11) is **0.25 mA or more** while decelerating as shown in the figure.



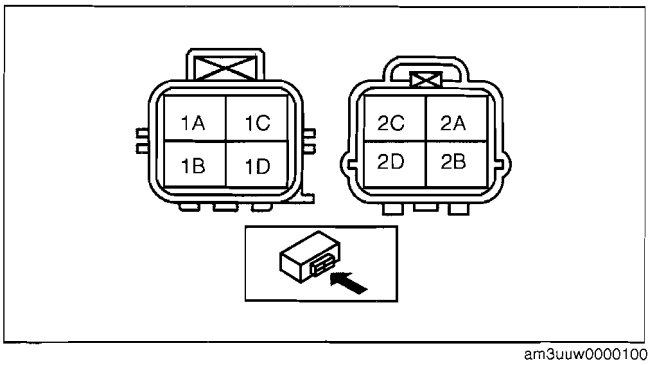
acxuuw00000099

- If not within the specification, inspect the HO2S for an open or short circuit. (See01-40B-40 Front HO2S Circuit Open/Short Inspection (Sensor).) Then if there is no malfunction in the wiring harness, replace the front HO2S.

Front HO2S Heater Resistance Inspection

1. Disconnect the front HO2S connector.
2. Measure the resistance between front HO2S terminals 2B and 2D.
   - If not within the specification, replace the front HO2S. (See01-40B-43 HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION[L3 WITH TC].)

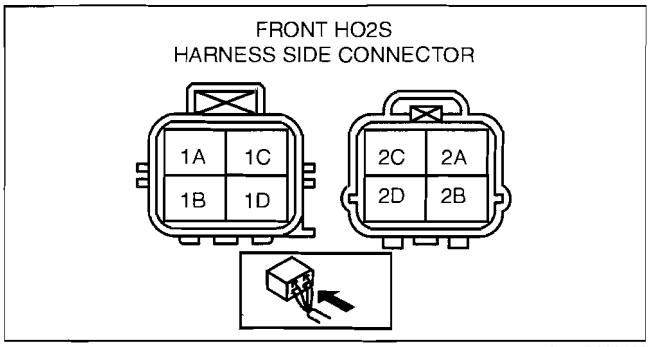
Front HO2S heater resistance
1—10 ohms



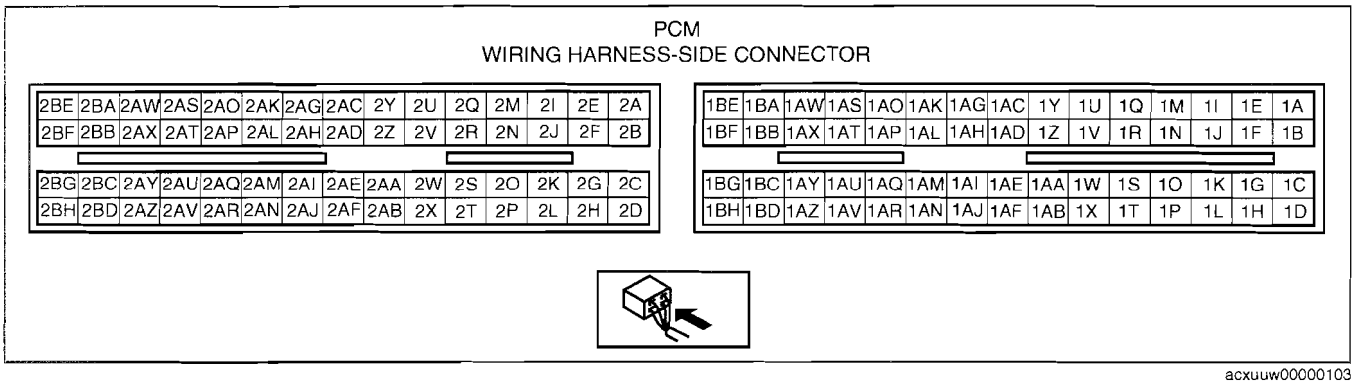
am3uuw0000100

Front HO2S Circuit Open/Short Inspection (Sensor)

1. Disconnect the PCM connector.
2. Disconnect the front HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



am3uuw0000100



acxuuw00000103

Open circuit

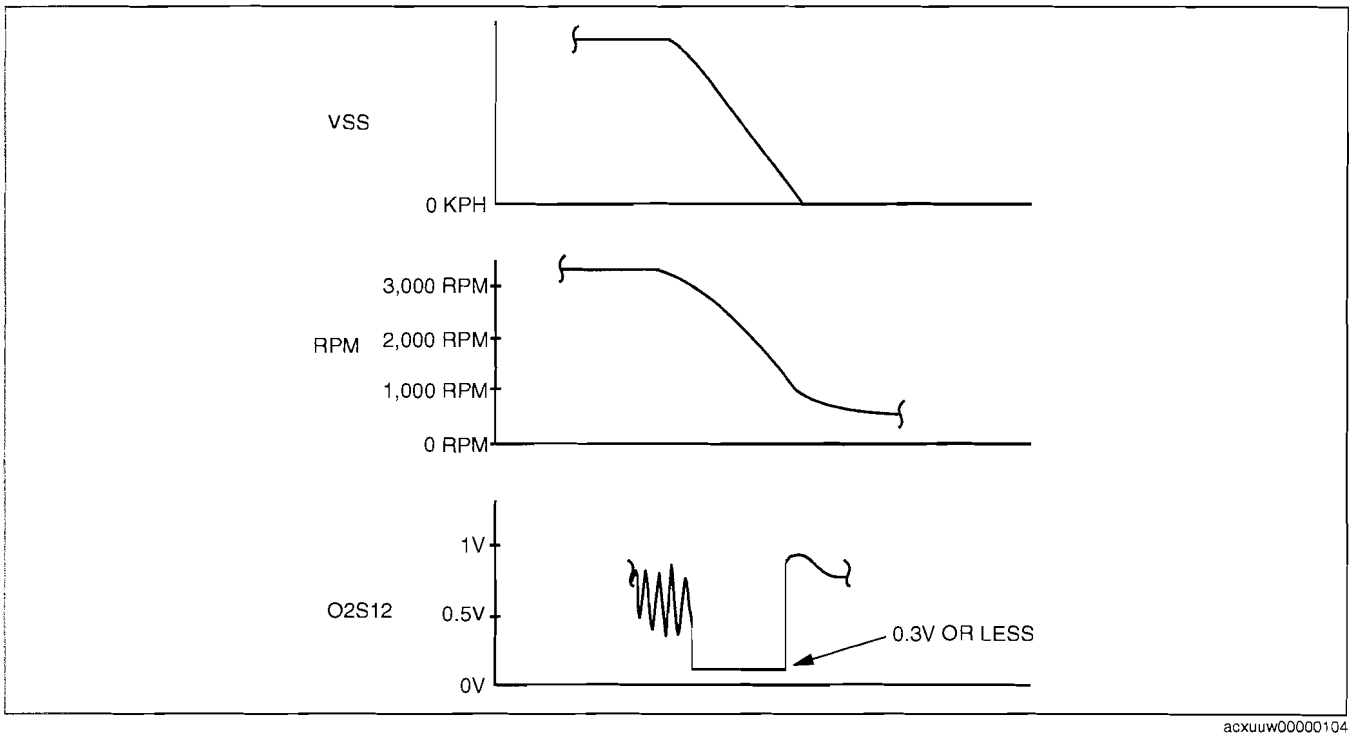
- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - — Front HO2S terminal 1A and PCM terminal 2AD
  - — Front HO2S terminal 1B and PCM terminal 2AC
  - — Front HO2S terminal 1C and PCM terminal 2Z

Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - — Front HO2S terminal 1A and body ground
  - — Front HO2S terminal 1A and power supply
  - — Front HO2S terminal 1B and body ground
  - — Front HO2S terminal 1B and power supply
  - — Front HO2S terminal 1C and body ground
  - — Front HO2S terminal 1C and power supply

Rear HO2S Voltage Inspection

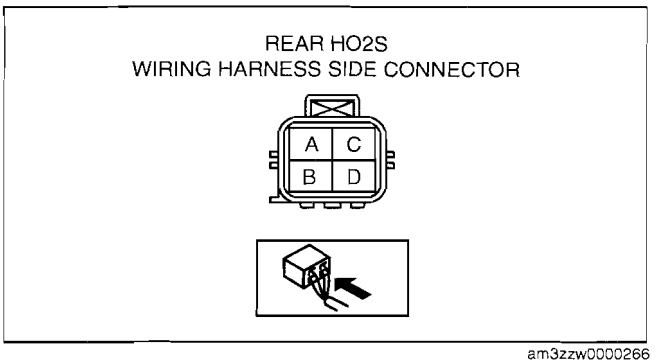
1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
   - Vehicle speed (PID: VSS)
   - Engine speed (PID: RPM)
   - Rear HO2S voltage (PID: O2S12)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more.**
4. Verify that the rear HO2S outputs a voltage of **0.6 V or more**, one time or more, then verify that the rear HO2S voltage (PID: O2S12) is **0.3 V or less** while decelerating as shown in the figure.



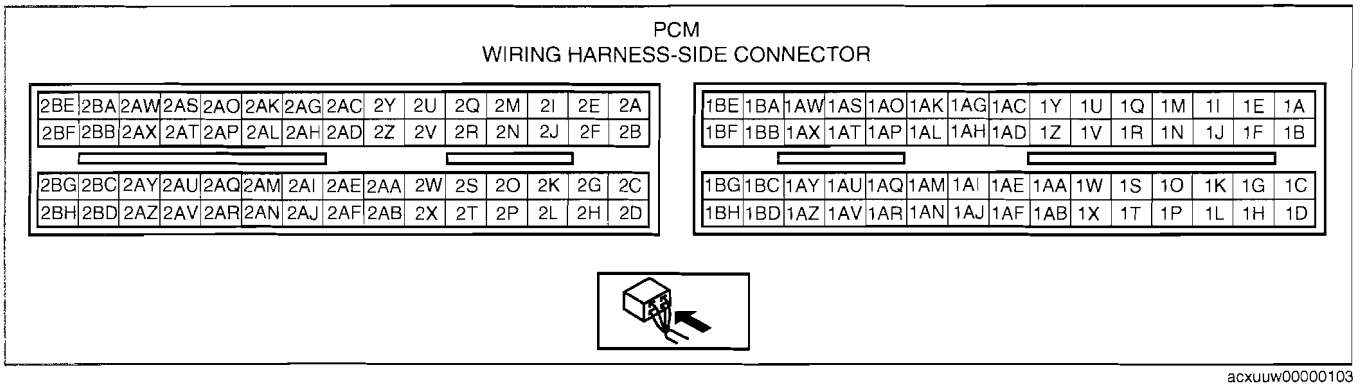
acxuuw00000104

- If not within the specification, inspect the HO2S for an open or short circuit. (See01-40B-42 Rear HO2S Circuit Open/Short Inspection.) Then if there is no malfunction in the wiring harness, replace the rear HO2S.

Rear HO2S Circuit Open/Short Inspection



am3zzw0000266



acxuuw00000103

1. Disconnect the PCM connector.
2. Disconnect the rear HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Rear HO2S terminal A and PCM terminal 2Q
  - Rear HO2S terminal B and PCM terminal 1BC

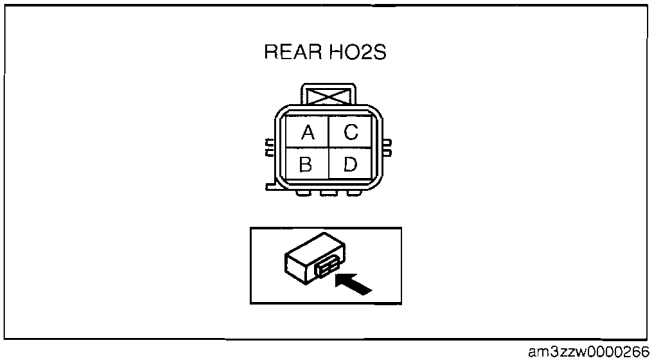
Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Rear HO2S terminal A and body ground
  - Rear HO2S terminal A and power supply
  - Rear HO2S terminal B and power supply

Rear HO2S Heater Resistance Inspection

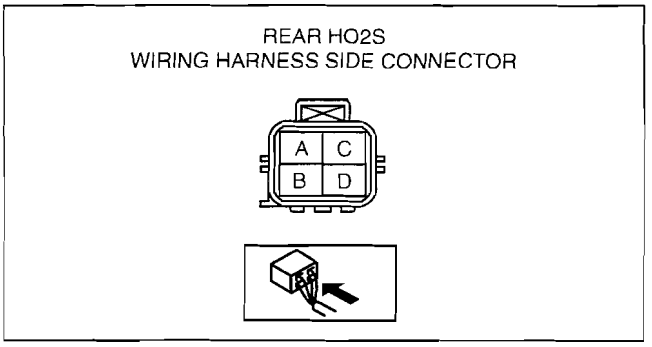
1. Disconnect the rear HO2S connector.
2. Measure the rear HO2S resistance between terminals C and D.
   - If not within the specification, replace the HO2S.

Rear HO2S heater resistance
2—50 ohms

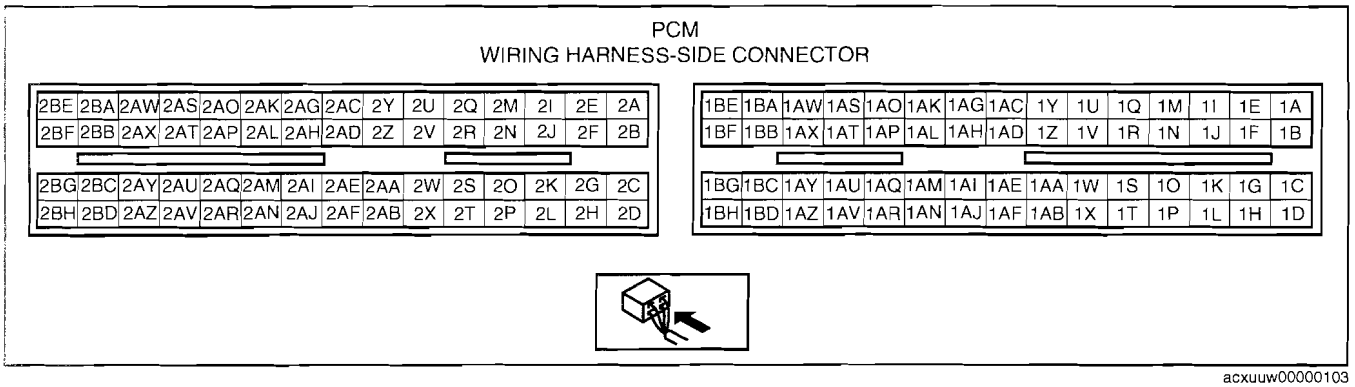


am3zzw0000266

Rear HO2S Heater Circuit Open/Short Inspection (Heater)



am3zzw0000266



acxuuw00000103

1. Disconnect the PCM connector.
2. Disconnect the rear HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - — Rear HO2S terminal C and ignition switch
  - — Rear HO2S terminal D and PCM terminal 2D

Short circuit

- If there is no continuity, there is a short circuit. Repair or replace the wiring harness.

  Rear
  - — Rear HO2S terminal A and body ground
  - — Rear HO2S terminal B and power supply
  - — Rear HO2S terminal B and body ground

HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION[L3 WITH TC]

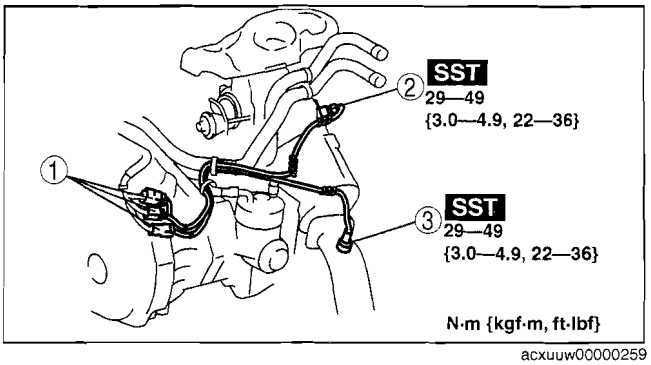
id014039804000

Warning

- **A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before removing the exhaust system.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

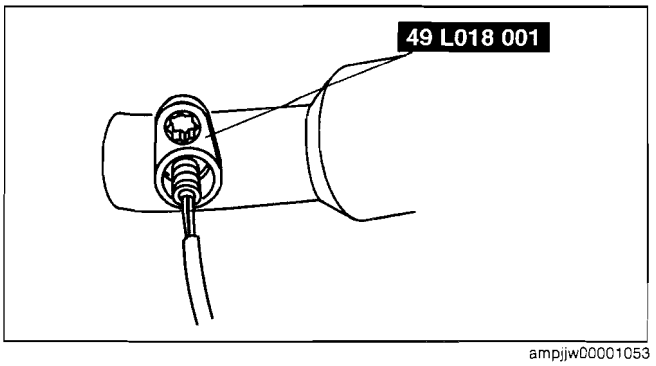
1	Connector
2	Front HO2S (See01-40B-44 HO2S Removal Note.)
3	Rear HO2S (See01-40B-44 HO2S Removal Note.)



acxuuw00000259

HO2S Removal Note

1. Remove the HO2S using the **SST**.



ampjjw00001053

CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC]

id014039800600

Removal

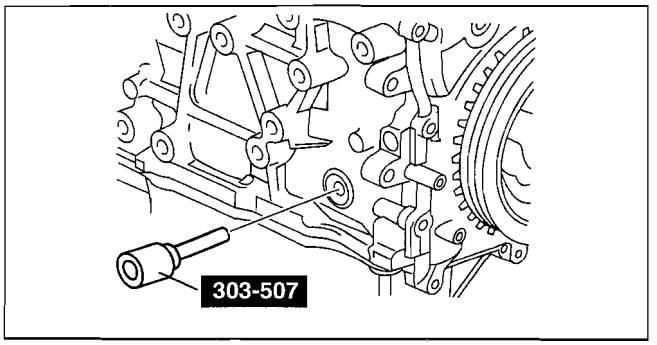
1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the splash shield (RH).
5. Disconnect the CKP sensor connector.
6. Remove the installation bolts to remove the CKP sensor.

Installation

Caution

- **When foreign material, such as an iron chips, gets on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect engine control. Be sure there is no foreign material on the CKP sensor when replacing.**

1. Perform the following procedure so that piston No.1 is at the top dead center.
   (1) Rotate the crankshaft in the direction of the engine rotation and remove the cylinder block lower blind plug when the No. 1 cylinder is at the point prior to top dead center (TDC) of compression, then install the SST.
   (2) Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the crank weight contacts SST and stops.)



acxuuw00001899

2. Using a straight edge, draw a straight line directly in the center of the twentieth tooth of the crankshaft pulley pulse wheel (counting counterclockwise from the empty space).

   Caution

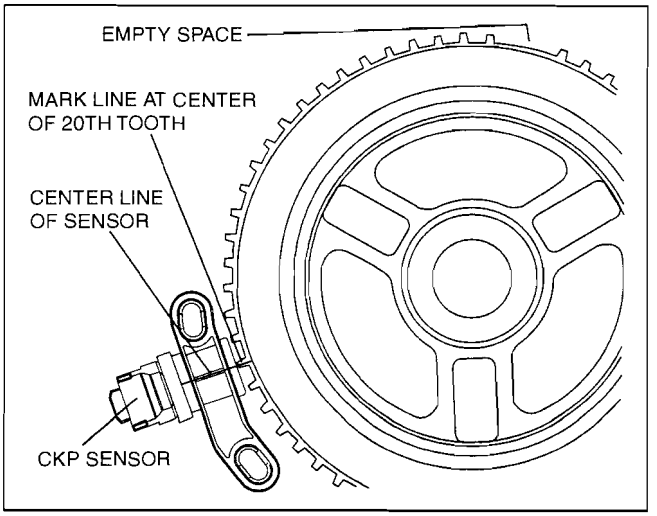
   - **If the line is not accurately drawn, ignition timing, fuel injection and other engine control systems will be adversely effected. Draw the straight line carefully using a straight edge.**

3. Align the center line of the crankshaft position sensor and the line drawn in Step 2, then install the sensor.
4. Install the CKP sensor fitting bolts.

   Tightening torque
   5.5—7.5 N·m {57—76 kgf·cm, 49—66 in·lbf}

5. Remove the **SST** then install the cylinder block lower blind plug.

   Tightening torque
   18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}



acxuuw00000075

CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[L3 WITH TC]

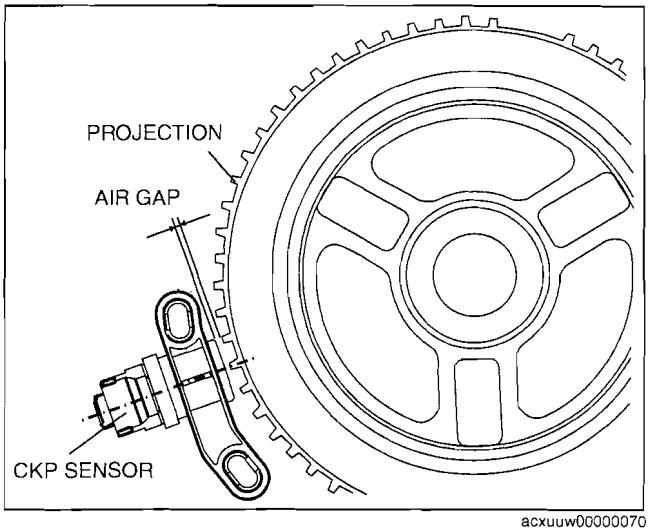
id014039800500

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Air Gap Inspection

1. Verify that the CKP sensor is securely installed.
2. Using a thickness gauge, measure the air gap between the plate projections at the back of crankshaft pulley and the CKP sensor.
   - If not within the specification, inspect the plate projections for cracks or bending.
     — If there is any malfunction, replace the plate.
     — If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

Air gap
0.5—1.5 mm {0.02—0.05 in}



acxuuw00000070

Visual Inspection

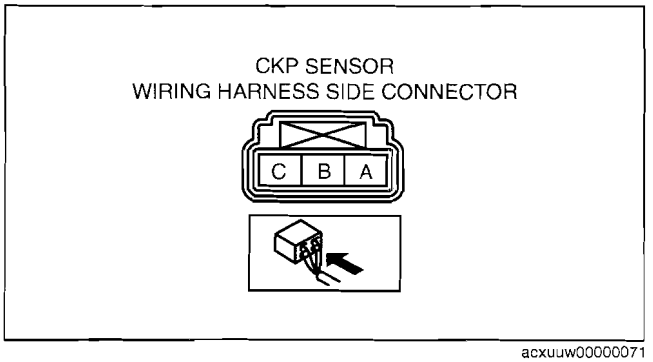
1. Disconnect the negative battery cable.
2. Remove the CKP sensor. (See01-40B-44 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].)
3. Verify that there are no metal shavings on the sensor.
   - If the monitor item condition/specification (reference) is without the specification even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

Voltage Inspection

1. Idle the engine.

Caution
- **Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.**

2. Measure the output voltage using an oscilloscope.
   - If not within the specification, replace the CKP sensor.
   - If the monitor item condition/specification (reference) is without the specification, even though the voltage is within the specification, carry out the "Circuit Open/Short Inspection".



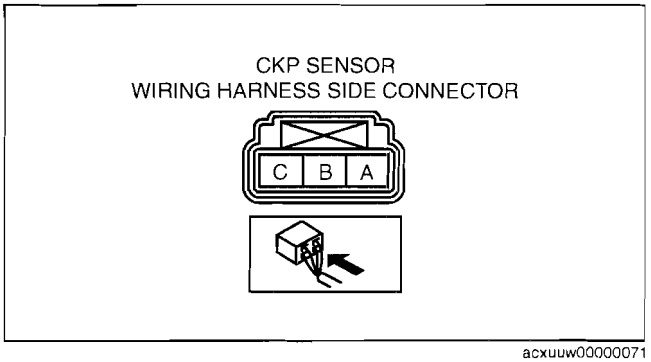
acxuuw00000071

Voltage

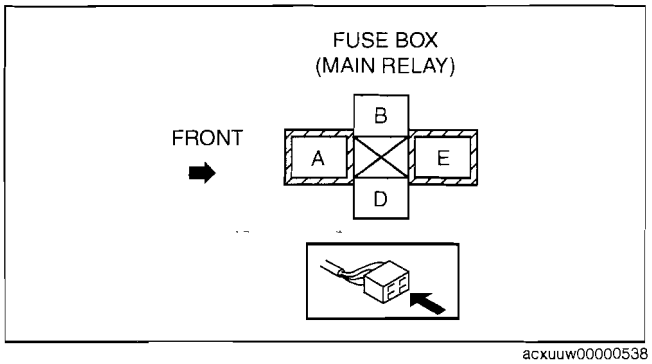
Terminal	Voltage (V)	Condition
A	Below 1.0	Under any condition
B	4.8 or more	High output*
	0.8 or less	Low output*
C	B+	Under any condition

*: Output voltage varies with crankshaft rotation.

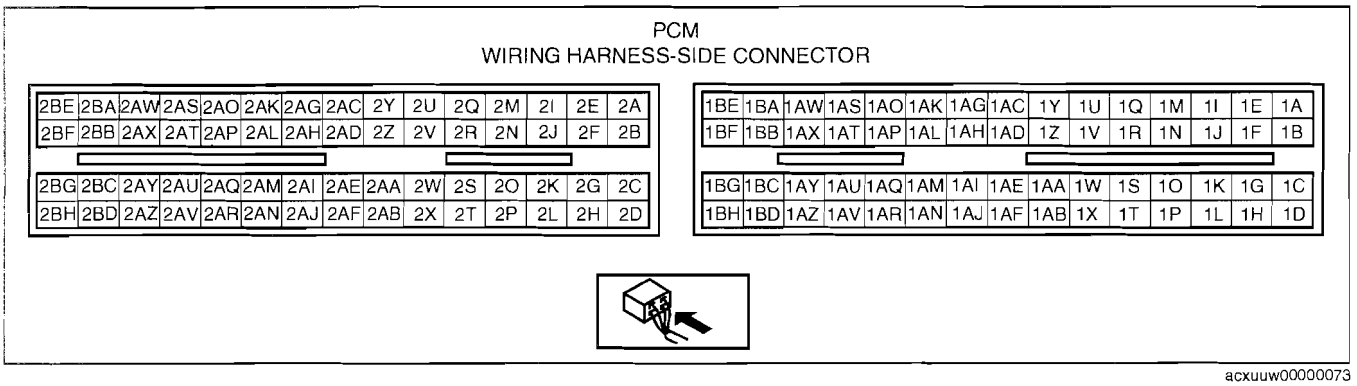
Circuit Open/Short Inspection



acxuuw00000071



acxuuw00000538



acxuuw00000073

1. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - CKP sensor terminal A and PCM terminal 2P
  - CKP sensor terminal B and PCM terminal 2W
  - CKP sensor terminal C and main relay terminal A

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - CKP sensor terminal A and power supply
  - CKP sensor terminal B and power supply
  - CKP sensor terminal B and body ground
  - CKP sensor terminal C and body ground

CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION[L3 WITH TC]

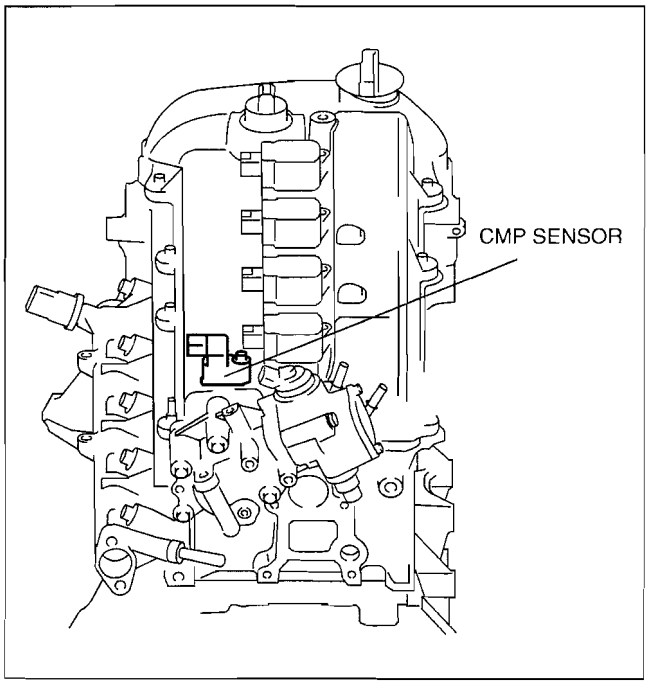
id014039801500

Caution

- **When replacing the CMP sensor, make sure there is no foreign material on it such as metal shavings. If it is installed with foreign material, the sensor output signal will malfunction resulting from fluctuation in magnetic flux and cause a deterioration in engine control.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the charge air cooler. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Disconnect the CMP sensor connector.
5. Remove the CMP sensor installation bolt.
6. Remove the CMP sensor from the cylinder head cover.
7. Install in the reverse order of removal.

Tightening torque
5.5—7.5 N·m {57—76 kgf·cm, 49—66 in·lbf}



acxuuw00000090

CAMSHAFT POSITION (CMP) SENSOR INSPECTION[L3 WITH TC]

id014039801400

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

Visual Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the CMP sensor. (See01-40B-47 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION[L3 WITH TC].)
4. Verify that there are no metal shavings on the sensor.
   - If the monitor item condition/specification (reference) is not within the specification even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

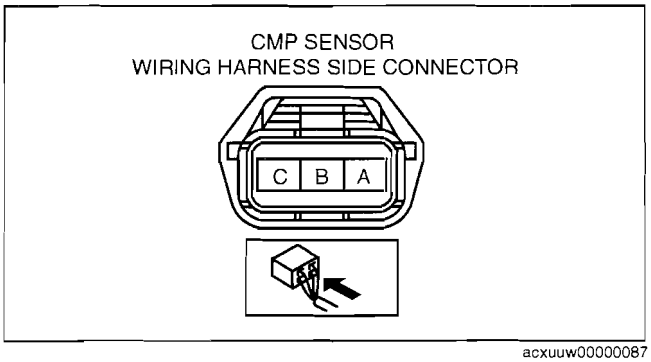
Voltage Inspection

1. Idle the engine.

Caution

- **Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.**

2. Measure the output voltage using an oscilloscope.
   - If not within the specification, replace the CMP sensor.
   - If the monitor item condition/specification (reference) is not within the specification, even though the voltage is within the specification, carry out the "Circuit Open/Short Inspection".



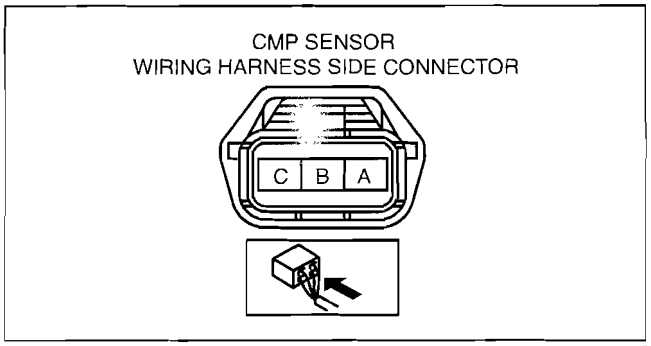
acxuuw00000087

Voltage

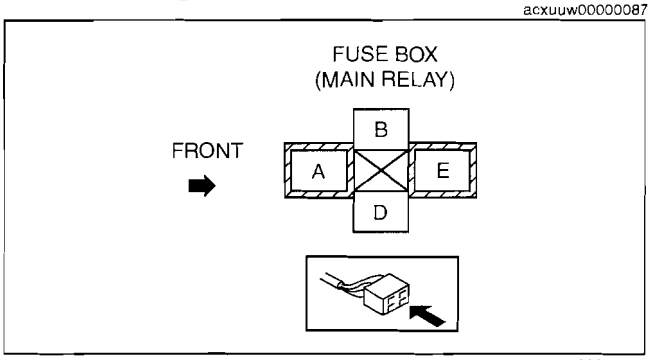
Terminal	Voltage (V)	Condition
A	B+	Under any condition
B	Below 1.0	Under any condition
C	4.8 or more	High output*
	0.8 or less	Low output*

*: Output voltage varies with camshaft rotation.

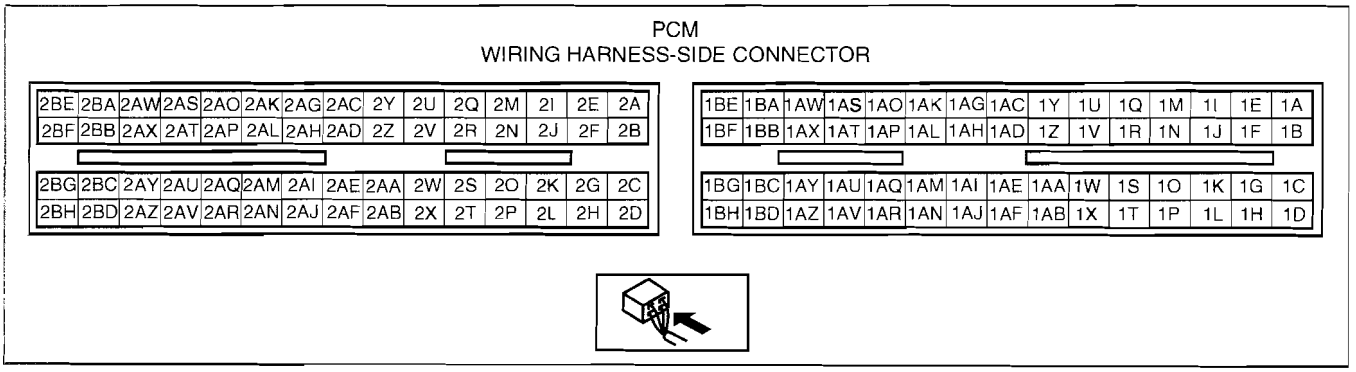
Circuit Open/Short Inspection



acxuuw00000087



acxuuw00000538



acxuuw00000089

1. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit
- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - CMP sensor terminal A and main relay terminal A
  - CMP sensor terminal B and PCM terminal 2P
  - CMP sensor terminal C and PCM terminal 2S

Short circuit
- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - CMP sensor terminal A and body ground
  - CMP sensor terminal B and power supply
  - CMP sensor terminal C and body ground
  - CMP sensor terminal C and power supply

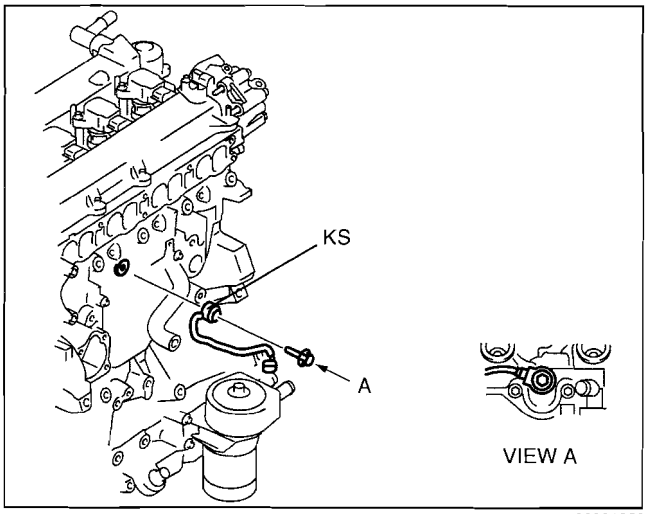
KNOCK SENSOR (KS) REMOVAL/INSTALLATION[L3 WITH TC]

id014039802900

Caution
- **Be careful not to impact the sensor.**
- **Verify that there is no debris between the sensor and the cylinder block before installing.**

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the intake manifold. (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
4. Remove the KS attachment bolt to remove the KS.
5. Install in the reverse order of removal.

Tightening torque
16—24 N·m {1.7—2.4 kgf·m, 12—17 ft·lbf}



acxuuw00001859

KNOCK SENSOR (KS) INSPECTION[L3 WITH TC]

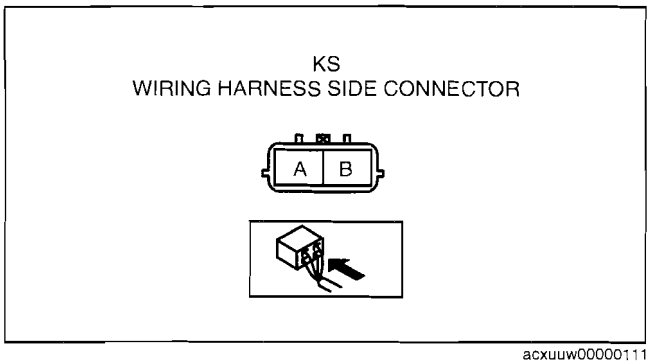
id014039802800

Note
- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See 00-00-3 HOW TO USE THIS MANUAL.)

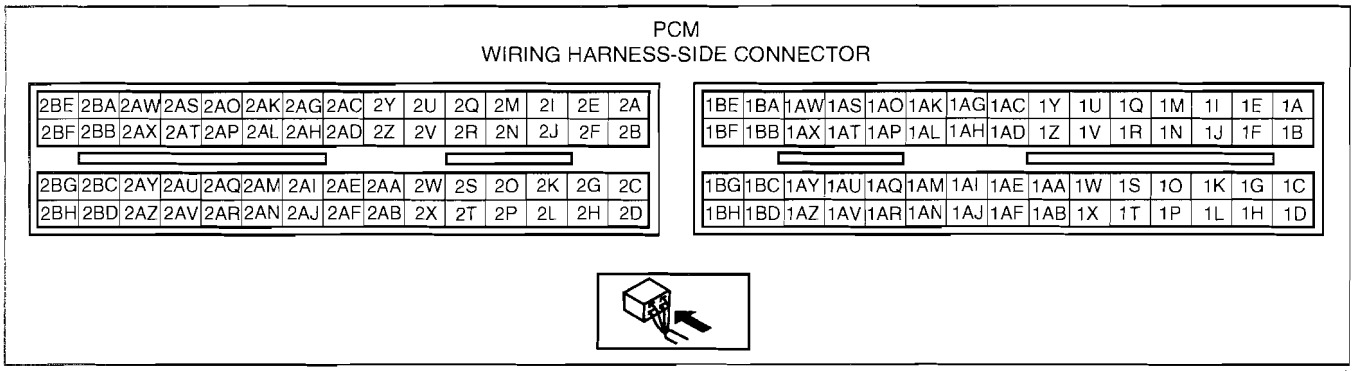
Resistance Inspection
1. Turn the ignition switch to the LOCK position.
2. Disconnect the KS connector.
3. Measure the resistance between KS terminals A and B using a tester.
   - If not as specified, replace the KS. (See01-40B-49 KNOCK SENSOR (KS) REMOVAL/INSTALLATION[L3 WITH TC].)
   - If the KS is normal, but the PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification
Approx. 4.87 megohms

Circuit Open/Short Inspection



acxuuw00000111



acxuuw00000112

1. Disconnect the PCM connector. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity check)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - KS terminal A and PCM terminal 2U
  - KS terminal B and PCM terminal 2V

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - KS terminal A and power supply
  - KS terminal A and body ground
  - KS terminal B and power supply
  - KS terminal B and body ground

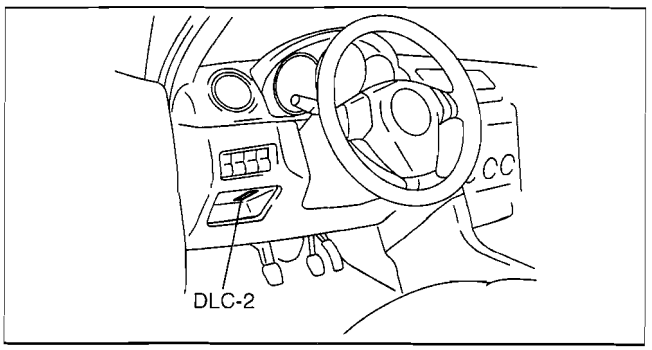
BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION[L3 WITH TC]

id014039801100

Note

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See00-00-3 HOW TO USE THIS MANUAL.)

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position.
3. Select BARO on the M-MDS.
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
   - If not as verified, replace the PCM. (See01-40B-7 PCM REMOVAL/INSTALLATION[L3 WITH TC].)



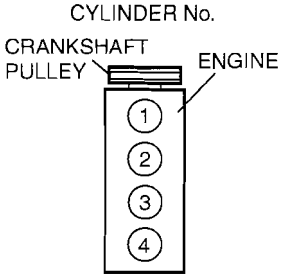
am3uuw0000100

01-50A TECHNICAL DATA [LF, L3]

ENGINE TECHNICAL DATA[LF, L3]

id0150a3800100

Item			Specification	
			LF (2.0 L)	L3 (2.3 L)
MECHANICAL				
Valve clearance [engine cold]	(mm {in})	IN	0.22—0.28 {0.0087—0.0110}	
		EX	0.27—0.33 {0.0107—0.0129}	
Compression pressure	(kPa {kgf/cm^2, psi}) [rpm]	Standard	1,400 {14.28, 203.1} [300]	1,372 {14.00, 199.1} [290]
		Minimum	980 {10.0, 142.2} [300]	960 {9.79, 139.2} [290]
		Maximum difference between cylinders	196.1 {2.0, 28.5}	
Cyiinder head bolt length	(mm {in})	Standard	145.2—145.8 {5.717—5.740}	
		Maximum	146.5 {5.767}	
Pushing distance of the front oil seal	(mm {in})		0—0.5 {0—0.019} (from the edge of the engine front cover)	
Oil control valve (OCV) [20 °C {68 °F}]	Resistance (ohm)		6.9—7.9	
Ignition timing	(BTDC)		8°	
Idle speed*1	(rpm)	No load (MTX)	600—700	
		No load (ATX)	650—750	
		E/L ON*2 (38—48 A)	650—750	
		E/L ON*2 (Above 48 A)	700—800	
		A/C ON and refrigerant pressure switch (middle) OFF	MTX: 700—800 ATX: 650—750	
		A/C ON and refrigerant pressure switch (middle) ON	MTX: 700—800 ATX: 670—770	
Idle mixture		HC concentration	Within the regulation	
		CO concentration	Within the regulation	
LUBRICATION SYSTEM				
Oil pressure (reference value) [oil temperature: 100 °C {212 °F}]	(kPa {kgf/cm^2, psi} [rpm]		337—591 {3.44—6.03, 49.0—85.8} [3,000]	
Oil capacity (approx. quantity)	Oil replacement	(L {US qt, Imp qt})	3.9 {4.1, 3.4}	
	Oil and oil filter replacement	(L {US qt, Imp qt})	4.3 {4.5, 3.8}	
	Total (dry engine)	(L {US qt, Imp qt})	4.6 {4.9, 4.0}	
COOLING SYSTEM				
Coolant capacity (approx. quantity)	(L {US qt, Imp qt})		With heater: 7.5 {7.9, 6.6} Without heater: 6.9 {7.3, 6.1}	
Radiator cap valve opening pressure	(kPa {kgf/cm^2, psi})		135—155 {1.38—1.58, 19.6—22.4}	
Thermostat	Initial-opening temperature	(°C {°F})	80—84 {176—183}	
	Full-opening temperature	(°C {°F})	97 {207}	
	Full-open lift	(mm {in})	8.0 {0.31} or more	
FUEL SYSTEM				
Fuel line pressure (kPa {kgf/cm^2, psi})		Fuel hold pressure	250 {2.55, 36.2} or more	
		Fuel static pressure	350—410 {3.57—4.18, 50.8—59.4}	
Fuel injector	Resistance	(ohm) [20°C {68°F}]	13.1—14.5*3 11.4—12.6*4	
	Leakage amount	(drop/2 min)	Less than 1	
	Injection volume	(ml {cc, cu in}/min)	260—320 {260—320, 15.9—19.5}*3 195—245 {195—245, 11.9—14.9}*4	

Item					Specification	
					LF (2.0 L)	L3 (2.3 L)
CHARGING SYSTEM						
Battery	Electrolyte gravity [20 °C {68 °F}]				1.22—1.29	
	Back-up current*5 (mA)				Vehicles with immobilizer system: 25—45 Vehicles without immobilizer system: 30 or less	
	Test load chart (A)	Battery type (5-hour rate)	50D20L (40)		150	
			75D23L (52)		195	
			80D26L (55)		—	195
	Slow charge (A)	Battery type (5-hour rate)	50D20L (40)		4.0—5.0	
			75D23L (52)		5.0—6.0	
			80D26L (55)		—	5.5—6.5
	Quick charge (A/30 min.)	Battery type (5-hour rate)	50D20L (40)		25	
			75D23L (52)		35	
			80D26L (55)		—	35
Generator	Standard voltage (V)	Ignition switch ON	Terminal	B	B+	
				P	Approx. 1.0 or less	
				D	Approx. 0	
		Idle [20 °C {68 °F}]	Terminal	B	13.0—15.0	
				P	Approx. 3.0—8.0	
				D	*6	
	Minimum current value				70 % of the nominal output current (nominal output current: 90 A) [Ambient temp. 20°C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]	
	Rotor resistance (Between slip rings) (ohm)				1.8—2.2	
	Brush length	Standard (mm {in})			18.5 {0.73}	
		Minimum (mm {in})			5.0 {0.2}	
	Brush spring force	Standard (N {kgf, lbf})			4.8—6.0 {0.49—0.61, 1.08—1.34}	
		Minimum (N {kgf, lbf})			2.16 {0.22, 0.49}	
IGNITION SYSTEM						
Firing order					1-3-4-2 (all cylinders independent firing) 	
Spark plug	Type				LFG1 18 110 (ILTR5A-13G), L3Y2 18 110	
	Standard plug gap (mm {in})				1.25—1.35 {0.050—0.053}	
	Resistance [25 °C {77 °F}] (kilohm)				3.0—7.5	

Item					Specification	
					LF (2.0 L)	L3 (2.3 L)
STARTING SYSTEM						
Starter	No load test		Voltage	(V)	11	
			Current	(A)	90 or less	
	Pinion gap			(mm {in})	0.5—2.0 {0.02—0.07}	
	Commutator	runout	Maximum	(mm {in})	0.05 {0.002} max.	
		diameter	Standard	(mm {in})	29.4 {1.16}	
			Minimum	(mm {in})	28.8 {1.13}	
		depth	Standard	(mm {in})	0.4—0.6 {0.016—0.023}	
			Minimum	(mm {in})	0.2 {0.008}	
	Brush length		Standard	(mm {in})	12.3 {0.48}	
			Minimum	(mm {in})	7.0 {0.28}	
	Brush spring force		Standard	(N {kgf, lbf})	18.3—24.9 {1.87—2.53, 4.12—5.59}	
			Minimum	(N {kgf, lbf})	5.9 {0.6, 1.3}	

Engine oil specification

Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade	(ILSAC)	(ILSAC) API SL or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)

*1 : Excludes temporary idle speed drop just after the electrical loads (E/L) are turned on.
*2 : Generator generating current value.
*3 : California emission regulation applicable model
*4 : Except for California emission regulation applicable model
*5 : Back-up current is the constant flow of current (for audio unit, clock, PCM, etc.) that is supplied after leaving the battery undisturbed for **approx. 30 min** when the ignition switch is off (key has been removed) and all doors are closed.
*6 : Turn the following electrical loads on and verify that the voltage reading increases.

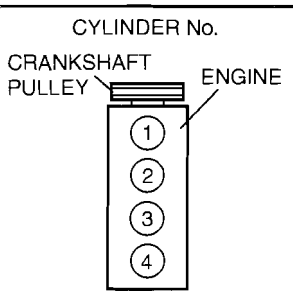
- Headlights
- Blower motor
- Rear window defroster

01-50B TECHNICAL DATA [L3 WITH TC]

ENGINE TECHNICAL DATA[L3 WITH TC]

id015039800100

Item	Specification
Standard valve clearance [Engine cold]	IN: 0.22—0.28 mm {0.0087—0.011 in} EX: 0.27—0.33 mm {0.011—0.012 in}
Compression	Standard: 1,280 kPa {13.1 kgf/cm^2, 185.65 psi}[250rpm] Minimum: 896 kPa {9.14 kgf/cm^2, 129.96 psi}[250rpm] Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm^2, 28.5 psi}
Cylinder head bolt length	Standard: 144.7—145.3 mm {5.697—5.720 in} Maximum: 146 mm {5.74 in}
Front oil seal press-in amount	0—0.5 mm {0—0.019 in}
OCV resistance	6.9—7.9 ohms [20°C {68°F}]
Ignition timing	Approx. BTDC 10°
Idle speed	No load: 650—750 rpm Electrical load on*1: 650—750 rpm P/S operation: 650—750 rpm A/C operation: 700—800 rpm
Idle mixture	HC concentration: Within the regulation CO concentration: Within the regulation
Engine oil capacity (approx. quantity)	Oil replacement: 5.3 L {5.6 US qt, 4.7 Imp qt} Oil and oil filter replacement: 5.7 L {6.0 US qt, 5.0 Imp qt} Total (dry engine): 6.4 L {6.8 US qt, 5.6 Imp qt}
Oil pressure (reference value) [oil temperature: 100 °C {212 °F}]	297—551 kPa {3.03—5.61 kgf/cm^2, 43.1—79.9 psi} [3,000 rpm]
Engine coolant capacity (approx. quantity)	7.5 L {7.9 US qt, 6.6 Imp qt}
Cooling system cap valve opening pressure	135—155 kPa {1.38—1.58 kgf/cm^2, 19.6—22.4 psi}
Thermostat initial-opening temperature	80—84 °C {176—183 °F}
Thermostat full-open temperature	97 °C {207 °F}
Thermostat full-open lift	More than 8.0 mm {0.31 in}
Fuel line pressure	410—490 kPa {4.2—4.9 kgf/cm^2, 60—71 psi}
Fuel pump hold pressure	More than 230 kPa {2.3 kgf/cm^2, 33 psi}
Fuel injector resistance	1.0—1.2 ohms [20 °C {68 °F}]
Battery electrolyte specific gravity [20 °C {68 °F}]	1.22—1.29
Battery load test current	55D23L (48): 180 A80D26L (55): 195 A
Battery back-up current	Vehicles with immobilizer system: 25—45 mA Vehicles without immobilizer system: 30 mA or less
Battery slow charge current	55D23L (48): 4.5—5.5 A80D26L (55): 5.5—6.5 A
Battery quick charge current [30 min]	55D23L (48): 30 A80D26L (55): 35 A
Generator standard voltage [IG-ON]	Terminal B: B+ Terminal P: Approx. 1 V or less Terminal D: Approx. 0 V
Generator standard voltage [Idle, 20 °C {68 °F}]	Terminal B: 13—15 V Terminal P: Approx. 3—8 V Terminal D: Turn the electrical loads (headlights, blower motor, rear window defroster) on and verify that the voltage reading increases.
Generator generated current minimum value	70 % of the nominal output current (nominal output current: 110 A) [Ambient temp. 20 °C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]
Generator rotor resistance (between slip rings) [20 °C {68 °F}]	2.0—2.3 ohm
Generator brush length	Standard: 22.5 mm {0.89 in} Minimum: 5.0 mm {0.20 in}

Item	Specification
Generator brush spring force	Standard: 4.1—5.3 N {0.42—0.54 kgf, 0.92—1.19 lbf} Minimum: 1.7 N {0.17 kgf, 0.38 lbf}
Firing order	1-3-4-2 (all cylinders independent firing)
	
Spark plug type	L3K9 18 110A, L3Y3 18 110
Spark plug gap	0.7—0.8 mm {0.028—0.031 in}
Spark plug resistance [25°C {77 °F}]	3.0—7.5 kilohms
Starter no-load test voltage	11 V
Starter no-load test current	90 A or less
Starter pinion gap	0.5—2.0 mm {0.02—0.07 in}
Starter armature runout	0.05 mm {0.002 in} max.
Starter commutator diameter	Standard: 29.4 mm {1.16 in} Minimum: 28.8 mm {1.13 in}
Segment groove depth of starter commutator	Standard: 0.4—0.6 mm {0.016—0.023 in} Minimum: 0.2 mm {0.008 in}
Starter brush length	Standard: 12.3 mm {0.48 in} Minimum: 7.0 mm {0.28 in}
Starter brush spring force	Standard: 18.3—24.9 N {1.87—2.53 kgf, 4.12—5.59 lbf} Minimum: 5.9 N {0.6 kgf, 1.3 lbf}

*1 : When the following electrical loads are on: Headlights, rear defroster, cooling fan No.1, cooling fan No.2, and the blower motor (2-step or more.)

Recommended engine oil

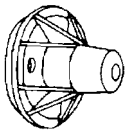
Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade	 (ILSAC)	  (ILSAC) API SM or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)

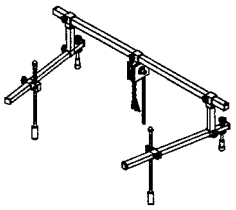
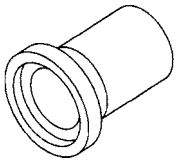
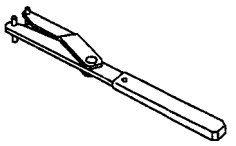
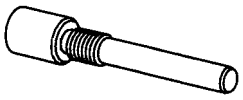
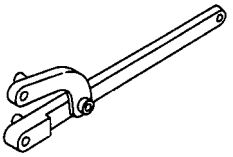
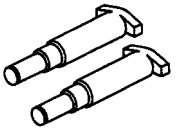
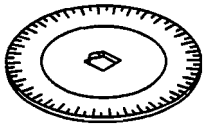
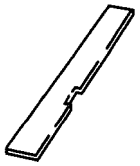
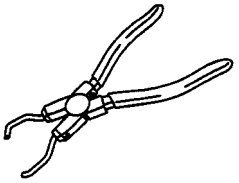
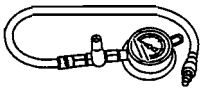
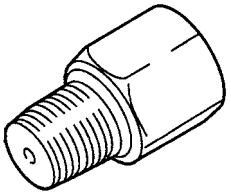
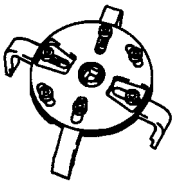
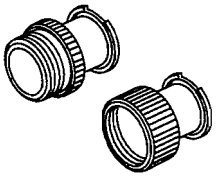
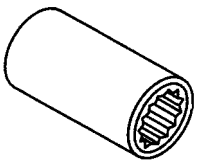
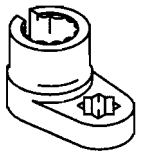
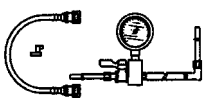
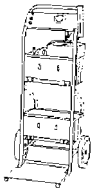
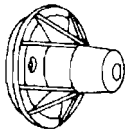
01-60A SERVICE TOOLS [LF, L3]

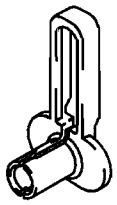
ENGINE SST[LF, L3]

id0160a1800100

1: Mazda **SST** number
2: Global **SST** number
Example

1:49 UN30 3328 2:303–328 Rear oil seal replacer	

1:49 C017 5A0 2: – Engine support set 	1:49 H010 401 2: – Oil seal installer 	1:49 G032 354 2: – Adjusting wrench 
1: – 2:303–507 Crankshaft TDC setting peg 	1:49 UN20 5072 2:205–072 Holder 	1:49 B011 105 2: – Adapter 
1:49 D032 316 2: – Protractor 	1:49 UN30 3465 2:303–465 Camshaft Alignment Timing Tool 	1:49 E042 001 2:– Remover 
1:49 0187 280A 2: – Oil pressure gauge 	1:49 E019 001 2:– Adapter 	1:49 F042 001 2: – Wrench 
1:49 B015 0A0 2:– Adapter set 	1:49 D015 001 2:– Box wrench 	1:49 L018 001 2: – HO2S wrench 
1:49 N013 1A0D 2:– Fuel pressure gauge set 	1: – 2:134-01049 Evaporative emission system tester 	1:49 UN30 3328 2:303–328 Rear oil seal replacer 

1: 49 N013 103A 2:– Remover (Part of 49 N013 1A0D) 	—	—

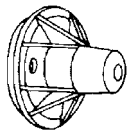
01-60B SERVICE TOOLS [L3 WITH TC]

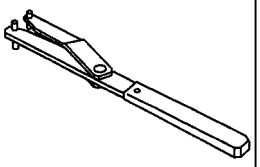
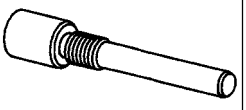
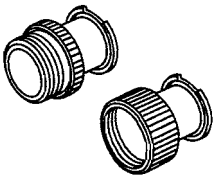
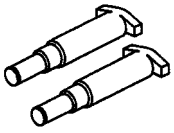
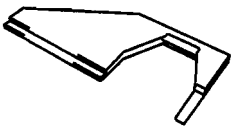
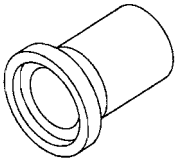
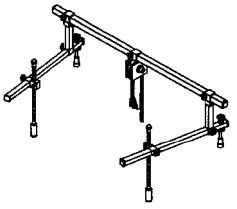
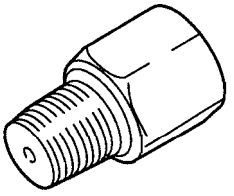
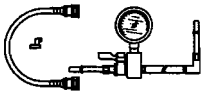
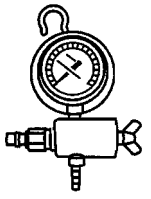
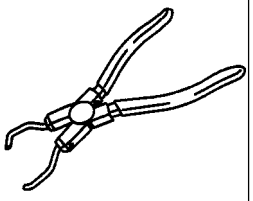
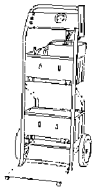
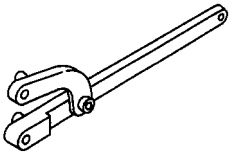
ENGINE SST[L3 WITH TC]

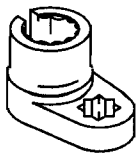
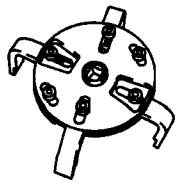
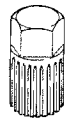
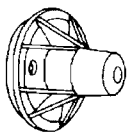
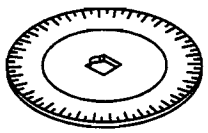
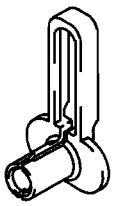
id016039800100

1: Mazda SST number
2: Global SST number

Example

1:49 UN30 3328 2:303–328 Rear oil seal replacer	

1:49 G032 354 2:– Adjusting wrench 	1:– 2:303–507 Crankshaft TDC timing peg 	1:49 B015 0A0 2:– Adapter set 
1:49 UN20 507202 2:205–07202 Crankshaft holding tool pins 	1:49 UN30 310610 2:303–1061 Camshaft alignment timing tool 	1:49 H010 401 2:– Oil seal installer 
1:49 G013 101 2:– Remover 	1:49 C017 5A0 2: – Engine support set 	1:49 E019 001 2:– Adapter 
1:49 N013 1A0D 2:– Fuel pressure gauge set 	1:49 0187 280A 2:– Oil pressure gauge 	1:49 H080 740A 2: – Pressure tester 
1:49 E042 001 2:– Remover 	1: – 2:134-01049 Evaporative emission system tester 	1:49 UN20 5072 2:205–072 Holder 

1:49 L018 001 2:– O2 sensor wrench 	1:49 F042 001 2: – Wrench 	1:49 L018 002 2:– Serrated bit 
1:49 UN30 3328 2:303–328 Rear oil seal replacer 	1:49 D032 316 2: – Protractor 	1: 49 N013 103A 2:– Remover (Part of 49 N013 1A0D) 

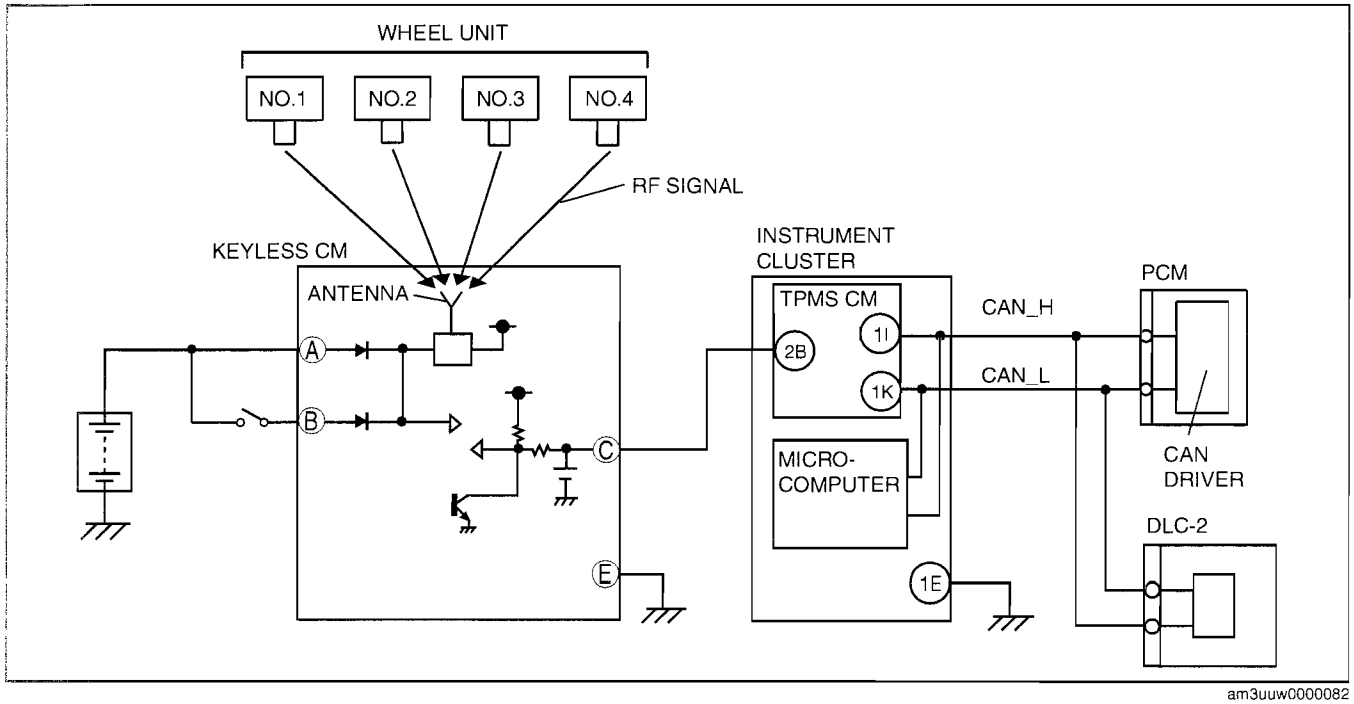
SUSPENSION

02
SECTION

02-02 ON-BOARD DIAGNOSTIC

TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM

id020200800100



am3uuw0000082

TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS

id020200800200

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the TPMS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - — Provides a quick inspection of the TPMS usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - — Read/clear diagnostic results, PID monitor and active command mode.

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the instrument cluster memory.

PID/Data monitor and record

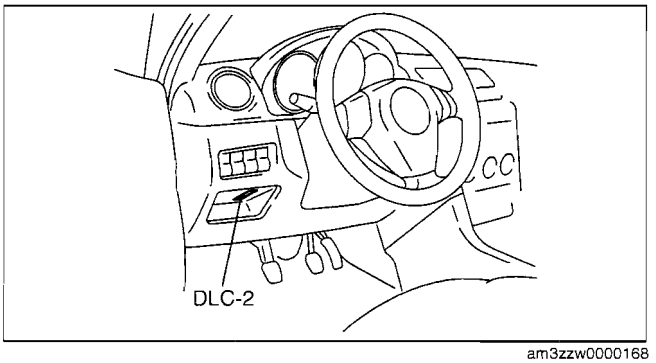
- This function allows you to access certain data values, input signals, calculated values, and system status information.

Active command modes

- This function allows you to control devices through the M-MDS.

Reading DTCs Procedure

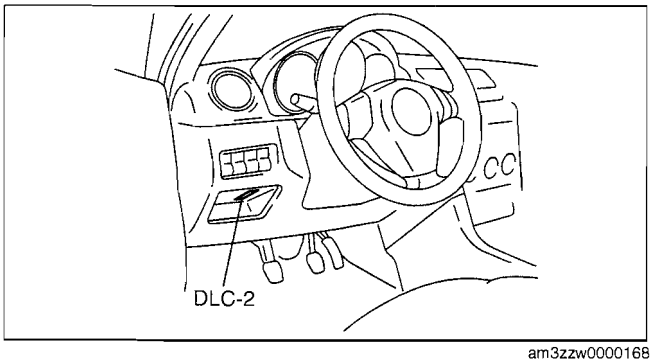
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "TPM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TPM".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the TPMS. (See 02-02-2 Clearing DTCs Procedures.)



am3zzw0000168

Clearing DTCs Procedures

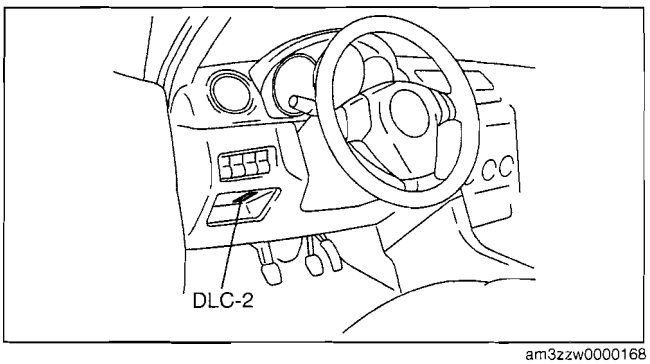
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "TPM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TPM".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



am3zzw0000168

PID/Data Monitor and Record Procedure

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "TPM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TPM".
     3. Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



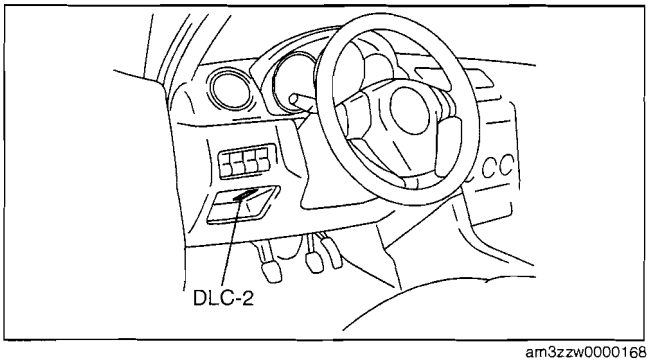
am3zzw0000168

Note

- The PID/Data monitor function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value.

Active Command Modes Procedure

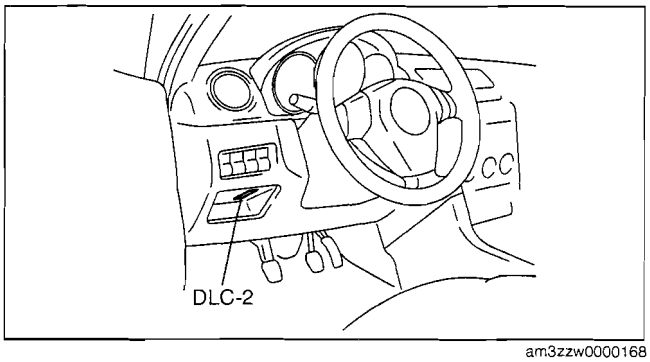
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "TPM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TPM".
     3. Select "DataLogger".
3. Select the active command modes from the PID table.
4. Perform the active command modes.



am3zzw0000168

Freeze Frame PID Data Access Procedure

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - This function is available for only the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Body".
     3. Select "TPMS Functions".
     4. Select "Freeze Frame Data".



am3zzw0000168

DTC Table

DTC M-MDS	Description	Page
B1342	Instrument cluster internal malfunction	(See 09-02C-5 DTC B1342[INSTRUMENT CLUSTER].)
B2143	ID registration failure	(See 02-02-7 DTC B2143.)
B2477	Instrument cluster configuration not performed	(See 09-02C-5 DTC B2477[INSTRUMENT CLUSTER].)
B2868	Wheel unit No.1 internal malfunction	(See 02-02-7 DTC B2868, B2869, B2870, B2871.)
B2869	Wheel unit No.2 internal malfunction	(See 02-02-7 DTC B2868, B2869, B2870, B2871.)
B2870	Wheel unit No.3 internal malfunction	(See 02-02-7 DTC B2868, B2869, B2870, B2871.)
B2871	Wheel unit No.4 internal malfunction	(See 02-02-7 DTC B2868, B2869, B2870, B2871.)
U0073	Communication failure between instrument cluster and keyless receiver	(See 09-02B-11 DTC U0073, U2012[MULTIPLEX COMMUNICATION SYSTEM].)
U0127	Communication failure between instrument cluster and keyless receiver	(See 02-02-8 DTC U0127.)
U2616	Wheel unit No.1 (No response)	(See 02-02-9 DTC U2616, U2617, U2618, U2619.)
U2617	Wheel unit No.2 (No response)	(See 02-02-9 DTC U2616, U2617, U2618, U2619.)
U2618	Wheel unit No.3 (No response)	(See 02-02-9 DTC U2616, U2617, U2618, U2619.)
U2619	Wheel unit No.4 (No response)	(See 02-02-9 DTC U2616, U2617, U2618, U2619.)

PID/DATA Monitor Table

PID Name (Definition)	Unit/ Condition	Condition/Specification	Action
AI_WU1_ID AI_WU2_ID AI_WU3_ID AI_WU4_ID (Wheel unit ID code (during ID registration))	–	Indicates the wheel unit ID code. (During wheel unit ID registration.)	• Replace the wheel unit. • Perform the wheel unit ID registration.
AI_WU1_P AI_WU2_P AI_WU3_P AI_WU4_P (Tire pressure value (during ID registration))	Pa, psi	Indicates the tire pressure. (During ID registration.)	• Adjust tire pressure. • Replace the wheel unit. • Perform the wheel unit ID registration.
FFD1_WU1_P FFD1_WU2_P FFD1_WU3_P FFD1_WU4_P (Tire pressure value (freeze frame PID data 1))	Pa, psi	Indicates the tire pressure. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_WU1_P FFD2_WU2_P FFD2_WU3_P FFD2_WU4_P (Tire pressure value (freeze frame PID data 2))	Pa, psi	Indicates the tire pressure. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_WU1_T FFD1_WU2_T FFD1_WU3_T FFD1_WU4_T (Internal tire air temperature value (freeze frame PID data 1))	°C, °F	Indicates the internal tire air temperature. (Freeze frame PID data 1)	Adjust tire pressure.

PID Name (Definition)	Unit/ Condition	Condition/Specification	Action
FFD2_WU1_T FFD2_WU2_T FFD2_WU3_T FFD2_WU4_T (Internal tire air temperature value (freeze frame PID data 2))	°C, °F	Indicates the internal tire air temperature. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_MLG (Wheel unit mileage value (freeze frame PID data 1))	m, mi (ft)	Indicates the mileage. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_MLG (Wheel unit mileage value (freeze frame PID data 2))	m, mi (ft)	Indicates the mileage. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_SPD (Wheel unit speed value (freeze frame PID data 1))	KPH, MPH	Indicates the speed. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_SPD (Wheel unit speed value (freeze frame PID data 2))	KPH, MPH	Indicates the speed. (Freeze frame PID data 2)	Adjust tire pressure.
CCNT_TPMS (Number of continuous DTCs)	–	Indicates number of DTC	Perform the DTC inspection.
ID_LAST* (Last received tire transmitter ID code value)	–	Indicates the last ID that is transmitted from the wheel unit.	• Replace the wheel unit. • Perform the configuration.
ID_WU1* ID_WU2* ID_WU3* ID_WU4* (Registered wheel unit ID code)	–	Indicates the registered ID that is transmitted from the wheel unit.	• Replace the wheel unit. • Perform the wheel unit ID registration.
SPDOMETER (Vehicle speed)	KPH, MPH	• Vehicle is stopped: **0 KPH {0 MPH}** • Vehicle is running: Indicates vehicle speed	Inspect the PCM.
VBATT (Battery positive voltage)	V	• Ignition switch ON: **B+** • Ignition switch OFF: **0 V**	• Inspect the battery. • Inspect the related wiring harness.
WU1_P* WU2_P* WU3_P* WU4_P* (Tire pressure value)	Pa, psi	Indicates the tire pressure. (See 02-50-1 SUSPENSION TECHNICAL DATA.)	• Adjust tire pressure. • Replace the wheel unit.
WU1_T* WU2_T* WU3_T* WU4_T* (Internal tire air temperature value)	°C, °F	Indicates the internal tire air temperature.	Replace the wheel unit.

*: Data transmission from the wheel unit occurs when the vehicle speed is **25 km/h {15.5 mph} or more.** Due to this, the current air pressure and temperature data can only be displayed after the vehicle is driven at **25 km/h {15.5 mph} or more.** Also, the ID_LAST, and tire pressure and internal tire air temperature data are erased when the instrument cluster connector and the battery terminal are disconnected. If the instrument cluster is replaced or the battery terminals are disconnected, drive the vehicle at **25 km/h {15.5 mph} or more** and display the tire pressure PID after the data transmission.

Active Command Modes Table

Command Name	Definition	Operation	Note
IDR_MODE	Wheel unit ID registration mode	On/Off	Ignition switch at ON

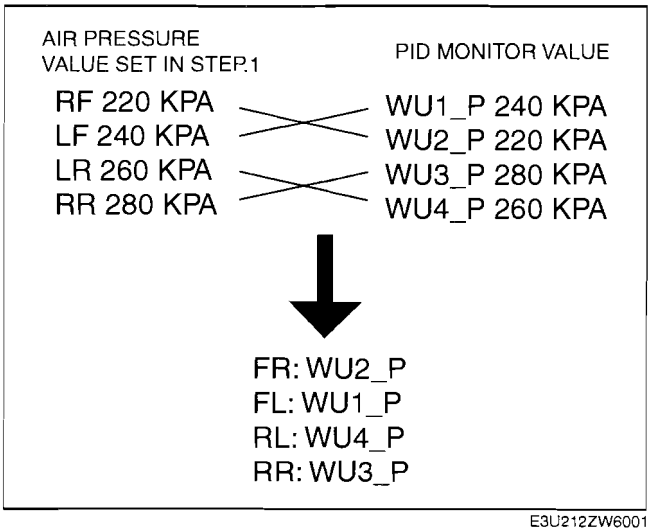
MALFUNCTIONING WHEEL UNIT IDENTIFICATION

id020200800300

Note

- The tire pressure monitoring system (TPMS) does not identify the location of the failed wheel unit on the vehicle (LF, RF, LR, RR). The TPMS identifies each wheel unit as No.1, No.2, No.3 and No.4. In order to identify the location of the wheel unit, perform the following procedure.

1. Adjust the air pressure as follows:
   - RF: 220 kPa {2.2 kgf/cm^2, 32 psi}
   - LF: 240 kPa {2.4 kgf/cm^2, 35 psi}
   - LR: 260 kPa {2.6 kgf/cm^2, 38 psi}
   - RR: 280 kPa {2.8 kgf/cm^2, 40 psi}
2. Turn the ignition switch off.
3. Connect the M-MDS to the DLC-2.
4. Turn the ignition switch to the ON position.
5. Drive the vehicle at a speed of **25 km/h {15.5 mph}** for **2 min or more**.
6. Select the following PIDs using the M-MDS, and monitor them.
   - PRS_WU1
   - PRS_WU2
   - PRS_WU3
   - PRS_WU4
7. Determine which wheel unit identification code matches which wheel and tire by comparing the PID monitor values with the air pressure values set in Step 1.
8. Select the LAST_ID PID using the M-MDS, and take a note of four displayed identification codes.
9. Inspect the DTCs using the M-MDS.



E3U212ZW6001

DTC B2143

id020200800400

DTC B2143	• **ID registration failure**
DETECTION CONDITION	• Two or more codes are overlapping.
POSSIBLE CAUSE	• ID registration procedure has not been performed properly.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY THE PROGRAMMED ID** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Select the following PIDs using the M-MDS: — ID_WU1 — ID_WU2 — ID_WU3 — ID_WU4 • Turn the ignition switch to the ON position. • Is the same code in the output ID?	Yes	Register the wheel unit ID, then go to the next step. (See 02-12-5 WHEEL UNIT ID REGISTRATION.)
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.) • Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more.** • Is the same DTC present?	Yes	• Repeat the inspection from Step 1. If the malfunction recurs, replace the instrument cluster and/or wheel unit. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.) (See 02-12-6 WHEEL UNIT REMOVAL/ INSTALLATION.)
		No	Go to the next step.
3	**VERIFY AFTER REPAIR PROCEDURE** • Are there any other DTCs present?	Yes	Go to the applicable DTC inspection. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)
		No	DTC troubleshooting completed.

DTC B2868, B2869, B2870, B2871

id020200800500

DTC	**B2868** **B2869** **B2870** **B2871**	**Wheel unit No.1 (internal malfunction)** **Wheel unit No.2 (internal malfunction)** **Wheel unit No.3 (internal malfunction)** **Wheel unit No.4 (internal malfunction)**
DETECTION CONDITION	• The instrument cluster receives error signals from the wheel unit.	
POSSIBLE CAUSE	• Internal malfunction of wheel unit	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**IDENTIFY MALFUNCTIONING WHEEL UNIT** • (See 02-02-6 MALFUNCTIONING WHEEL UNIT IDENTIFICATION.)		• Identify the malfunctioning wheel unit. • Replace and register the wheel unit. (See 02-12-5 WHEEL UNIT ID REGISTRATION.) • Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.) • Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more.** • Is the same DTC present?	Yes	Go to Step 1.
		No	Go to the next step.
3	**VERIFY AFTER REPAIR PROCEDURE** • Are there any other DTCs present?	Yes	Go to the applicable DTC inspection. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)
		No	DTC troubleshooting completed.

DTC U0127

id020200800600

DTC U0127	• **Communication failure between instrument cluster and keyless CM**
DETECTION CONDITION	• The instrument cluster cannot receive signal from the keyless CM.
POSSIBLE CAUSE	• Open or short circuit in the wiring harness between the keyless CM terminal C and the instrument cluster terminal 2B. • Keyless receiver malfunction. • Instrument cluster malfunction. • Poor connection at connectors (female terminal)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT WHEEL UNIT SIGNAL FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect keyless receiver and instrument cluster connectors. • Inspect for continuity between keyless CM terminal C (harness-side) and instrument cluster terminal 2B (harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit between keyless CM terminal C and instrument cluster terminal 2B, then go to Step 4.
2	**INSPECT WHEEL UNIT SIGNAL FOR SHORT TO POWER** • Turn the ignition switch off. • Disconnect keyless receiver and instrument cluster connectors. • Measure the voltage between keyless CM terminal C (harness-side) and ground. • Is there B+?	Yes	Repair or replace the wiring harness for a short to power between keyless CM terminal C and instrument cluster terminal 2B, then go to Step 4.
		No	Go to the next step.
3	**INSPECT WHEEL UNIT SIGNAL FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect keyless receiver and instrument cluster connectors. • Inspect for continuity between keyless CM terminal C (harness-side) and ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground between keyless CM terminal C and instrument cluster terminal 2B, then go to the next step.
		No	Replace keyless receiver, then go to the next step. (See 09-14-27 KEYLESS CONTROL MODULE REMOVAL/ INSTALLATION.)
4	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.) • Turn the ignition switch to the ON position and wait for **30 s.** • Is the same DTC present?	Yes	• If the malfunction recurs, replace the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.) • Configure the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER CONFIGURATION.) • Register the wheel unit ID. (See 02-12-5 WHEEL UNIT ID REGISTRATION.) • Go to the next step.
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more.** • Are there any other DTCs present?	Yes	Go to the applicable DTC inspection. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)
		No	DTC troubleshooting completed.

DTC U2616, U2617, U2618, U2619

id020200800700

DTC	U2616 U2617 U2618 U2619	**Wheel unit No.1 (No response)** **Wheel unit No.2 (No response)** **Wheel unit No.3 (No response)** **Wheel unit No.4 (No response)**
DETECTION CONDITION	• The keyless receiver has continuously not received a signal from the wheel unit for a certain period.	
POSSIBLE CAUSE	• Wheel unit identification code is not registered in the instrument cluster. • No signal is received from the wheel unit. • Wheel unit is not installed. • Poor connection at connectors (female terminal).	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY WHEEL UNIT IS INSTALLED TO EACH WHEEL** • Are all four wheels equipped with a wheel unit?	Yes	Go to the Step 3.
		No	• Install the wheel unit. (See 02-12-6 WHEEL UNIT REMOVAL/INSTALLATION.) • Register the wheel unit ID. (See 02-12-5 WHEEL UNIT ID REGISTRATION.) • Go to the next step.
2	**INSPECT FOR DTCs** • Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more**. • Is the same DTC present?	Yes	Go to the next step.
		No	Go to the Step 5.
3	**IDENTIFY MALFUNCTIONING WHEEL UNIT** • (See 02-02-6 MALFUNCTIONING WHEEL UNIT IDENTIFICATION.)		• Identify the malfunctioning wheel unit. • Replace the wheel unit. (See 02-12-6 WHEEL UNIT REMOVAL/INSTALLATION.) • Register the wheel unit ID. (See 02-12-5 WHEEL UNIT ID REGISTRATION.) • Go to the Step 5.
4	**INSPECT FOR KEYLESS CM MALFUNCTION** • Inspect the keyless CM. • Is there any malfunction?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the memory. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.) • Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more**. • Is the same DTC present?	Yes	• If the malfunction recurs, replace the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) • Configure the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER CONFIGURATION.) • Register the wheel unit ID. (See 02-12-5 WHEEL UNIT ID REGISTRATION.) • Go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Are there any other DTCs present?	Yes	Go to the applicable DTC inspection. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)
		No	DTC troubleshooting completed.

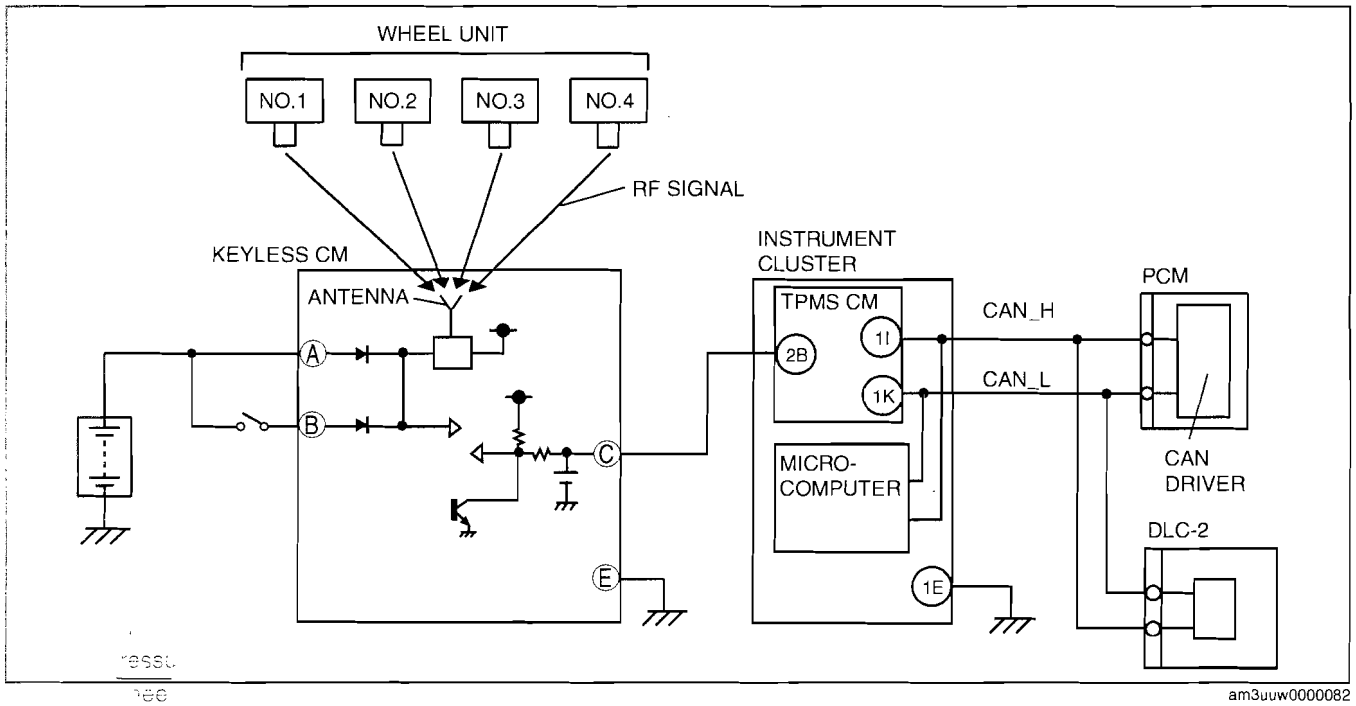
Note

- If the installed wheel unit ID number is known, verification of whether the instrument cluster is receiving data from the wheel unit can be easily confirmed using the following procedure:
  1. Drive the vehicle at **25 km/h {15.5 mph} or more**, and send data from the wheel unit.
  2. Select [ID_LAST] from the PID items, and monitor the data.
  3. Verification that the instrument cluster is receiving data is possible if the monitored ID number matches the installed wheel unit ID number.
- If the wheel unit has been newly replaced, the TPMS warning light may flashes before the ID registration is complete, and DTC U2616, U2617, U2618 and U2619 may be stored in the memory. In this case, re-implement the wheel unit ID registration, and after confirming that the TPMS warning light is no longer flashing, erase the DTC. If the TPMS warning light does not go out, a malfunction on any one of the wheel units may have occurred and the ID registration will not have been correctly performed. Repeat the diagnostic procedure from Step 1 and perform and inspection.

02-03 SYMPTOM TROUBLESHOOTING

TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM

id020300800100



am3uuw0000082

FOREWORD

id020300800200

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To check the DTC, follow the DTC Inspection steps. (See 02-02-2 TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)

PRECAUTION

id020300800300

Intermittent Concern Troubleshooting

Vibration method

- If a malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the following steps.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Inspect the following:
  - — Connectors not fully seated.
  - — Wiring harnesses not having full play.
  - — Wiring harnesses laying across brackets or moving parts.
  - — Wiring harnesses routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harnesses pass through the firewall, body panels and other panels are the major areas to be inspected.

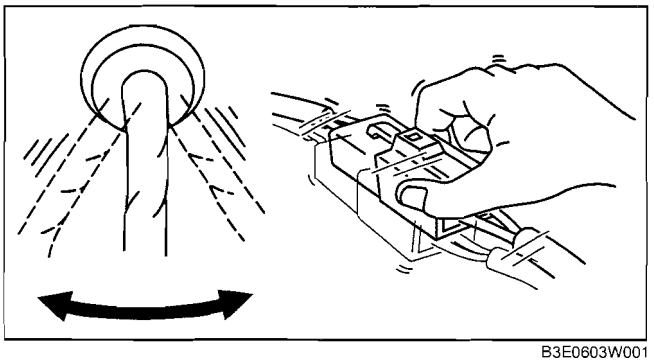
Inspection method for switch and/or sensor connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (engine off).

Note

- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn the switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect for poor connection.



B3E0603W001

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (engine off).

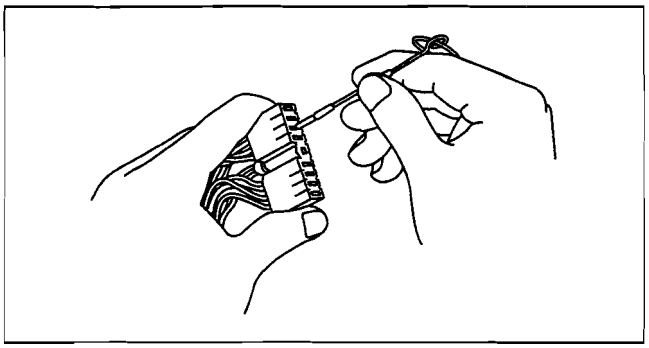
Note

- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or a malfunction occurs, inspect for poor connection and/or poorly mounted sensor.

Connector terminal inspection method

1. Inspect the connection of each female terminal.
2. Insert the male terminal to the female terminal and inspect the female terminal for looseness.



B3E0603W002

SYMPTOM TROUBLESHOOTING

id020300800400

No.	Symptom
1	TPMS warning light illuminates continuously.
2	TPMS warning light (low pressure warning) illuminates after engine start and turns off after driving for a period of time.
3	Wheel unit ID registration cannot be performed (TPMS warning light flashes).

No.1 TPMS WARNING LIGHT ILLUMINATES CONTINUOUSLY

id020300800500

Caution

- **The tire pressure cannot be measured accurately after driving for a long period due to the internal temperature and pressure. Stop the vehicle for approx. 1 hour and then perform the tire pressure measurement and adjustment.**
- **Use a high accuracy digital gauge for measurement of the tire pressure.**

Note

- If the DTC clearing procedure is implement, the TPMS warning light turns off.

1	TPMS warning light illuminates continuously
[TROUBLESHOOTING HINTS] • Tire pressure is lower than the specification.	

STEP	INSPECTION		ACTION
1	INSPECT THE TIRE • Is there any foreign object adhering to the tire?	Yes	Remove any foreign object. Replace the tire if necessary, and then go to the next step.
		No	Go to the next step.
2	INSPECT THE TIRE PRESSURE • Is the tire pressure lower than the specification?	Yes	Adjust the tire pressure to the specification when the tires are cold, and then go tot the next step.
		No	Go to the next step.
3	DOES THE TPMS WARNING LIGHT TURN OFF?	Yes	Troubleshooting completed. Explain to the customer what has been repaired.
		No	Go to the next step.
4	DRIVE THE VEHICLE AT 25 KM/H FOR 10 MIN. • Does the TPMS warning light turn off?	Yes	Troubleshooting completed. Explain to the customer what has been repaired.
		No	Adjust the tire pressure to the specification, and then return to Step 1. **Note** • If the TPMS warning light does not turn off after repeating this step, the tire may be flat.

No.2 TPMS WARNING LIGHT (LOW PRESSURE WARNING) ILLUMINATES AFTER ENGINE START AND TURNS OFF AFTER DRIVING FOR PERIOD OF TIME

id020300800600

Caution

- **The tire pressure cannot be measured accurately after driving for a long period due to increased internal temperature and pressure. Stop the vehicle for approx. 1 hour and then perform the tire pressure measurement and adjustment.**
- **Use a high accuracy digital gauge for measurement of the tire pressure.**

Note

- The tire pressure normally decreases by **approx. 7 kPa {0.07 kgf/cm^2, 1.02 psi}** per month even if the tire is normal.
- The FFD (temperature and pressure) stored when the TPMS warning light is turned on or off can be verified by operating the M-MDS.

2	**TPMS warning light (low pressure warning) illuminates after engine start and turns off after driving for a period of time.**
[TROUBLESHOOTING HINTS] • The tire pressure decreases (approaches value to illuminate TPMS warning light) when the internal temperature of the tire is low.	

STEP	INSPECTION		ACTION
1	**INSPECT THE TIRE** • Is there any foreign object adhering to the tire?	Yes	Remove any foreign object. Replace the tire if necessary, and then go to the next step.
		No	Go to the next step.
2	**MEASURE THE TIRE PRESSURE WHEN THE TIRES ARE COLD** • Has the tire pressure decreased (approaches value to illuminate TPMS warning light)?	Yes	Adjust the tire pressure to the specification, and then go to the next step.
		No	Go to the next step.
3	**IS THE MALFUNCTION CORRECTED?**	Yes	Troubleshooting completed.
		No	Verify troubleshooting again and return to Step 1 if the malfunction recurs.

No.3 WHEEL UNIT ID REGISTRATION CANNOT BE PERFORMED (TPMS WARNING LIGHT FLASHES)

id020300800900

Caution

- **Activate the wheel unit ID registration mode using the M-MDS, and perform the following steps if the TPMS warning light does not turn off after driving at 25 km/h {15.5 mph} or more for 10 min or more.**

3	**Wheel unit ID registration cannot be performed (TPMS warning light flashes).**
[TROUBLESHOOTING HINTS] • New wheel unit malfunction (caused when installing to wheel) • Any malfunction on an old wheel unit which has not been replaced.	

STEP	INSPECTION		ACTION
1	**CAN THE WHEEL UNIT ID BE REGISTERED?** • Connect the M-MDS. • Display the wheel unit ID registration condition (ID and tire pressure table) using the M-MDS. • Temporarily remove the battery and reinstall it immediately. **Note** • If the battery is removed, the tire pressure data for WU_1 to WU_4 stored in the instrument cluster is reset. • Pressure is **0 kPa {0 kgf/cm^2, 0 psi}** when it is displayed again using the M-MDS. • Set tire pressure for the four wheels separately. • Perform the wheel unit ID registration again. • Can the ID be registered?	Yes	Trouble shooting completed. (Adjust the tire pressure on four wheels, and then return the vehicle to the customer.)
		No	Go to the next step.
2	**VERIFY THE WHEEL UNIT ID REGISTRATION CONDITIONS (ID AND TIRE PRESSURE TABLE) USING THE M-MDS** • Refer to [Display Of M-MDS (Example)] to specify wheel unit for which the ID could not be registered. (See 02-03-5 Display Of M-MDS (Example).) • Is the wheel unit for which the ID could not be registered a new wheel unit? **Caution** • **ID numbers of WU_1 to WU_4 are updated when wheel on all of four wheels are registered.**	Yes	Replace with a new wheel unit, and then go to Step 4.
		No	Go to the next step.
3	Replace the old wheel unit, and then go tot the next step (any malfunction on an old wheel unit which has not been replaced).		
4	**CAN THE WHEEL UNIT ID BE REGISTERED?** • Perform the wheel unit ID registration using the M-MDS.	Yes	Troubleshooting completed.
		No	Verify troubleshooting again and return to Step 1 if the malfunction recurs.

Display Of M-MDS (Example)

Registered ID: 0xAAAAAAAA, 0xBBBBBBBB, 0xCCCCCCCC, and 0xDDDDDDDD (AAAAAAAA, BBBBBBBB, CCCCCCCC, and DDDDDDDD mean arbitrary numbers.)

Unregistered ID: 0x00000000

Tire pressure: aaa kPa, bbb kPa, ccc kPa, ddd kPa (aaa, bbb, ccc, and ddd mean measurement value.)

* The battery is removed, the stored tire pressure is reset to 0 kPa.

Three registered wheel units and a replaced wheel unit
When a replaced wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	bbb kPa	ccc kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

When a registered wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	bbb kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When two registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When a replaced wheel unit and a registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	bbb kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

When a replaced wheel unit and two registered wheel units malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

When three registered wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

Two registered wheel units and two replaced wheel units
When a replaced wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	bbb kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When a registered wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0xFFFFFFFF	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	fff kPa	0 kPa	0 kPa

When two replaced wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	bbb kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

When two registered wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0xFFFFFFFF	0x00000000	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	fff kPa	0 kPa	0 kPa

When a replaced wheel unit and a registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When two replaced wheel units and a registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

When a replaced wheel unit and two registered wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

A registered wheel unit and three replaced wheel units
When a registered wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0xFFFFFFFF	0xGGGGGGGG	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	fff kPa	ggg kPa	0 kPa

When a replaced wheel unit malfunctions

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0xFFFFFFFF	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	fff kPa	0 kPa	0 kPa

When a replaced wheel unit and a registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0xFFFFFFFF	0x00000000	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	fff kPa	0 kPa	0 kPa

When two replaced wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When two replaced wheel units and a registered wheel unit malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0xEEEEEEEE	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	0 kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	eee kPa	0 kPa	0 kPa	0 kPa

When three replaced wheel units malfunction

	WU_1	WU_2	WU_3	WU_4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaa kPa	0 kPa	0 kPa	0 kPa
Tire Pressure (Candidate)	0 kPa	0 kPa	0 kPa	0 kPa

02-10 GENERAL PROCEDURES

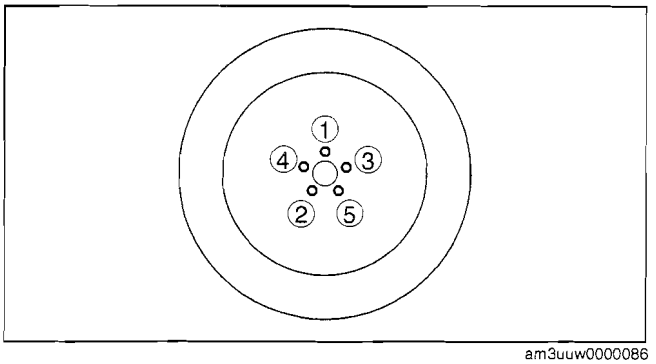
GENERAL PROCEDURES (SUSPENSION)

id021000800300

Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.

   Tightening torque
   88.2—117.6 N·m {9.00—11.99 kgf·m, 65.06—86.73 ft·lbf}



am3uuw0000086

Suspension Links Removal/Installation

1. For the joint sections with rubber bushings, raise the vehicle using a lift, and then temporarily tighten the installation bolts and nuts. Lower the vehicle to the ground and tighten them completely with the specified torque.

Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

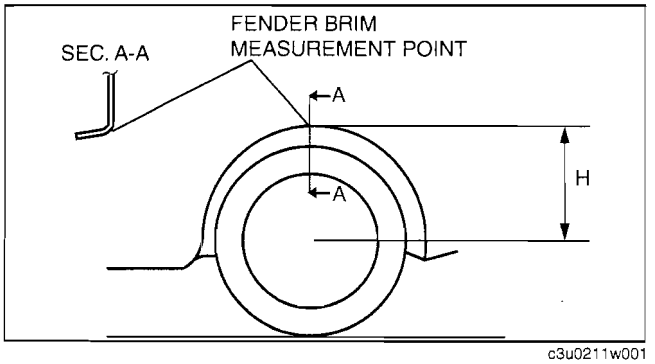
02-11 WHEEL ALIGNMENT

WHEEL ALIGNMENT PRE-INSPECTION

id021100800100

1. Park the vehicle on a level ground, in an unloaded condition*, and with the wheels straight forward.
   *: Unloaded condition.....Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
2. Inspect the tire pressure.
   - Adjust to the recommended pressure if necessary. (See 02-50-1 SUSPENSION TECHNICAL DATA.)
3. Inspect the wheel bearing play.
   - Correct if necessary. (See 03-11-2 WHEEL HUB, STEERING KNUCKLE INSPECTION.) (See 03-12-2 WHEEL HUB COMPONENT INSPECTION.)
4. Inspect the wheel runout.
   - Correct if necessary. (See 02-50-1 SUSPENSION TECHNICAL DATA.)
5. Rock the vehicle, and verify that there is no looseness in the steering wheel joint and suspension ball joint.
6. Rock the vehicle, and verify that the shock absorber operates properly.
7. Measure height H from the center of the wheel to the fender brim.
8. Verify that the difference between the left and right dimension H is within the specification.
   - If it exceeds the specification, repeat the Step 2—7.

Standard
10 mm {0.39 in} or less



c3u0211w001

FRONT WHEEL ALIGNMENT

id021100800200

Front wheel alignment [LF and L3] (Unloaded)*1

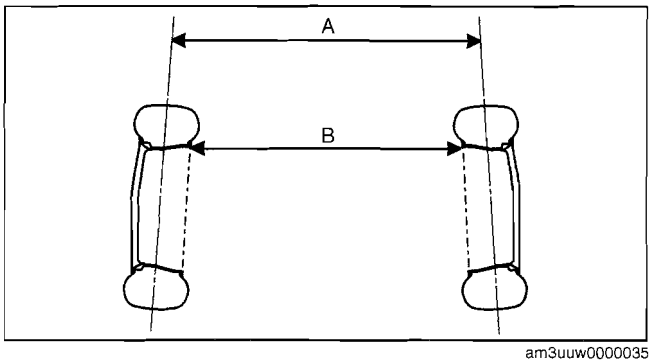
Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Maximum steering angle [Tolerance ±3°]		Inner	39°48′				
		Outer	32°48′				
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Caster angle*2 [Tolerance ±1°]			2°54′	2°56′	2°58′	3°00′	3°02′
Camber angle*2 [Tolerance ±1°]			−0°39′	−0°40′		−0°41′	
Steering axis inclination (Reference value)			13°52′	13°53′		13°55′	

Front wheel alignment [L3 WITH TC] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Maximum steering angle [Tolerance ±3°]		Inner	36°00′				
		Outer	30°12′				
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Caster angle*2 [Tolerance ±1°]			3°01′	3°02′	3°04′	3°06′	3°08′
Camber angle*2 [Tolerance ±1°]			−0°55′	−0°56′			−0°57′
Steering axis inclination (Reference value)			14°18′	14°20′			14°21′

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Note
Total toe-in measuring position
- Tire: A indicated in the figure (between the center of the tires)
- Rim inner: B indicated in the figure (between the inner side of the rims)

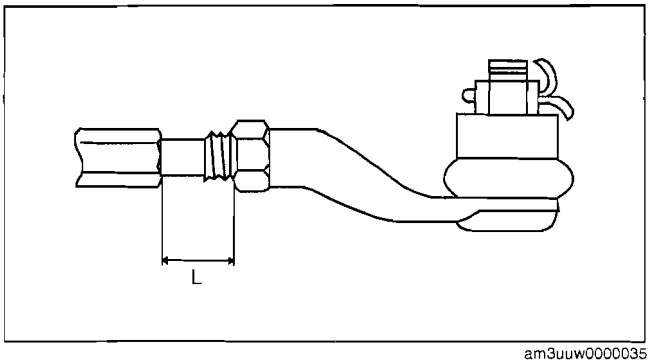


am3uuw0000035

Steering Angle Adjustment
1. Loosen the locknut of the tie-rod end.
2. Remove the rack boot clamp.
3. Rotate the tie rod and adjust the steering angle.

Note
- The travel distance of the right and left tie rods should be the same.

4. Rotate the tie rod and adjust so that the difference between right and left dimension L shown in the figure is less than the specification.



am3uuw0000035

Standard
3 mm {0.12 in} or less

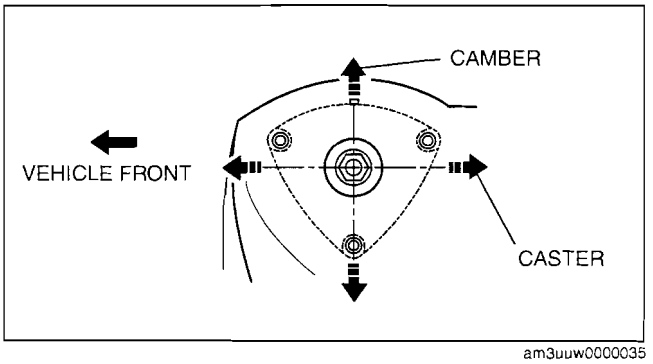
5. Tighten the locknut of the tie-rod end.

Tightening torque
78.6—108.0 N·m {8.02—11.01 kgf·m, 57.98—79.65 ft·lbf}

6. Correct the rack boot twists.
7. Install and fix the rack boot clamp.
8. After adjusting the steering angle, always inspect and adjust the toe angle.

Camber and Caster angle Adjustment

1. Remove the shock absorber upper nuts.
2. Move the shock absorber and coil spring to adjust the camber and caster angle.



am3uuw0000035

Note
- Moving the shock absorber and coil spring to the right or left side of the vehicle allows camber adjustment and forward and backward of the vehicle allows caster adjustment.
- Available camber adjustment range : ±10′
- Available caster adjustment range : ±10′

3. Install the shock absorber upper nuts.
4. Reinspect the alignment to make sure that it is within the specification.

Total Toe-in Adjustment

1. Loosen the locknut of the tie-rod end.
2. Remove the rack boot clamp.
3. Adjust the total toe-in by rotating each tie rod (left and right) in the opposite directions by the same amount respectively.

Note
- Toe angle changes by **approx. 6mm {0.2 in}** per one rotation of the tie rod for one wheel.
- Each tie rod has a right-hand thread. When increasing the toe-in angle, rotate the right tie rod toward the front of the vehicle and rotate the left tie rod toward the rear of the vehicle by the same amount.

4. Tighten the locknut of the tie-rod end.

Tightening torque
78.6—108.0 N·m {8.02—11.01 kgf·m, 57.98—79.65 ft·lbf}

5. Verify that the rack boot does not have any twisting and install the rack boot clamp.

REAR WHEEL ALIGNMENT

id021100800300

Rear wheel alignment [LF and L3] (Unloaded)*1

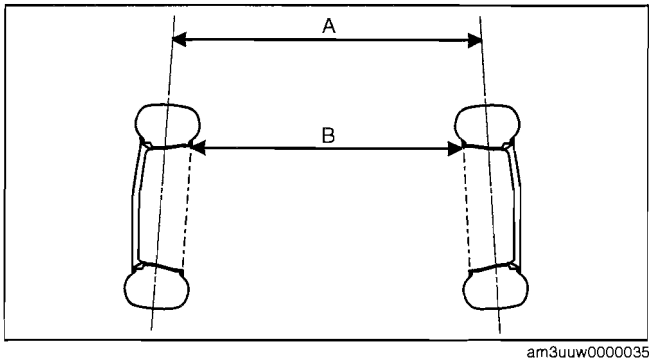
Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Camber angle*2 (Reference value) [Tolerance ±1°]			−1°20′	−1°21′	−1°23′	−1°25′	−1°27′
Thrust angle (Reference value) [Tolerance ±0°48′]			0°				

Rear wheel alignment [L3 WITH TC] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Camber angle*2 (Reference value) [Tolerance ±1°]			−1°36′	−1°37′	−1°39′	−1°40′	−1°42′
Thrust angle (Reference value) [Tolerance ±0°48′]			0°				

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Note
Total toe-in measuring position
- Tire: A indicated in the figure (between the center of the tires)
- Rim inner: B indicated in the figure (between the inner side of the rims)



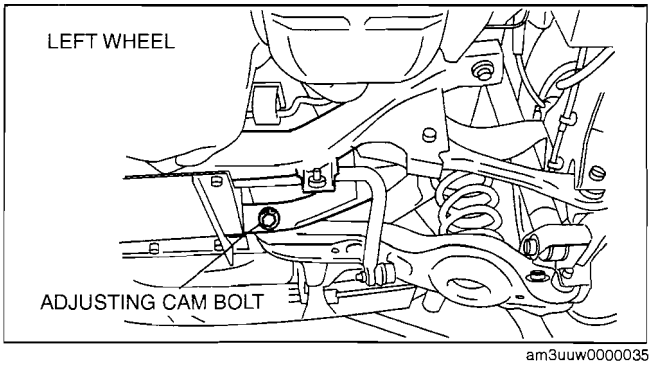
am3uuw0000035

Total Toe-in Adjustment
1. Loosen the installation nut of the adjusting cam bolt.
2. Rotate the adjusting cam bolt in either direction to adjust the camber.

	Left wheel	Right wheel
Toe-out direction	Clockwise	Counterclockwise
Toe-in direction	Counterclockwise	Clockwise

3. Tighten the nut.

Tightening torque
80.0—100.0 N·m {8.16—10.19 kgf·m, 59.01—73.75 ft·lbf}

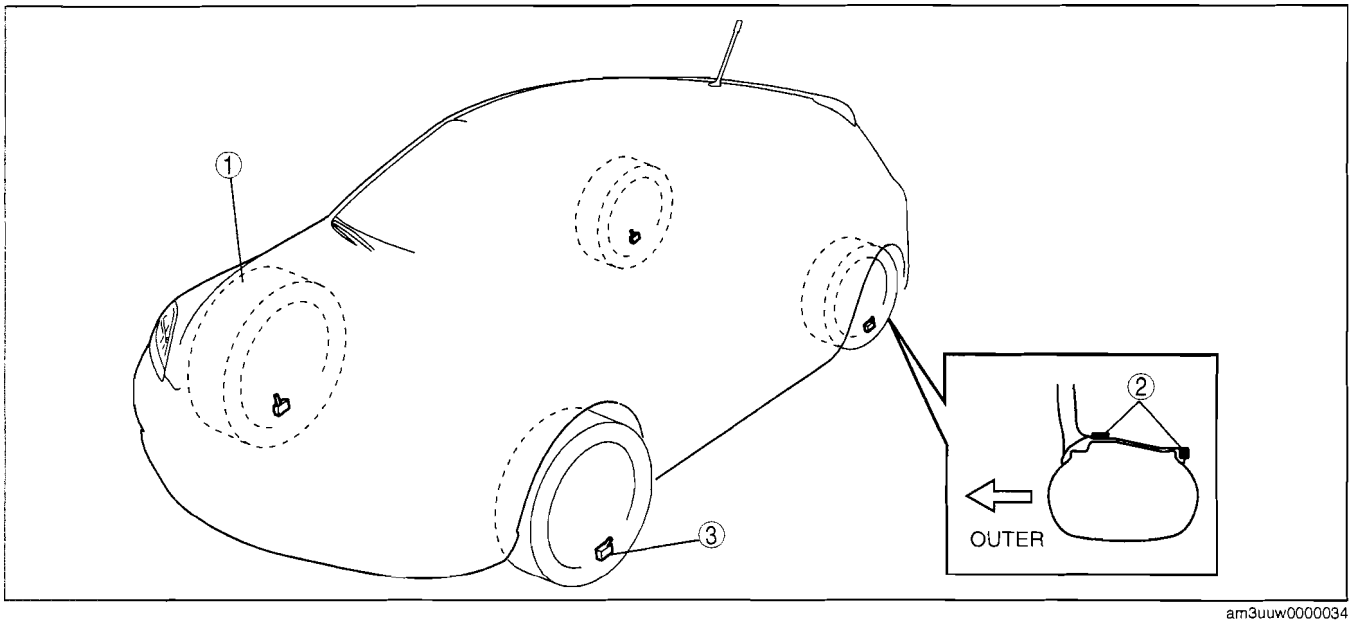


am3uuw0000035

02-12 WHEEL AND TIRES

WHEEL AND TIRES LOCATION INDEX

id021200801200



am3uuw0000034

1	Wheel and tire (See 02-12-2 WHEEL AND TIRE SPECIFICATION.) (See 02-12-4 TIRE PRESSURE ADJUSTMENT (WITH TPMS).)
2	Wheel balance weight (See 02-12-2 WHEEL BALANCE ADJUSTMENT (ALUMINUM ALLOY WHEEL).)
3	Wheel unit (See 02-12-5 WHEEL UNIT ID REGISTRATION.) (See 02-12-6 WHEEL UNIT REMOVAL/INSTALLATION.)

WHEEL AND TIRE SPECIFICATION

id021200800100

Wheel and tires

Item			Specification				
Standard tire and wheel							
Wheel	Size		15 ×6J		16 × 6 1/2J	17 × 6 1/2J	18 × 7J
	Offset	(mm {in})	52.5 {2.07}				
	Pitch circle diameter	(mm {in})	114.3 {4.50}				
	Material		Steel	Aluminum alloy			
Tire	Size		P195/65R15 89H		P205/55R16 89H	P205/50R17 88V	215/45R18 93Y
	Air pressure (kPa {psi})	Front	230 {34}		220 {32}	220 {32}	230 {34}
		Rear					220 {32}
	Remaining tread	(mm {in})	1.6 {0.06}				
Wheel and tire	Tightening torque	(N·m {kgf·m, ft·lbf})	88.2—117.6 {9.00—11.99, 65.06—86.73}				
	Wheel and tire runout (mm {in})	Radial direction	1.5 {0.06} max.				
		Lateral direction	2.5 {0.10} max.	2.0 {0.08} max.			
	Wheel imbalance	(g {oz})	Knock-type*2: 9 {0.32} max.	Adhesive-type*1: 14 {0.49} max. Knock-type*2: 9 {0.31} max.	Adhesive-type*1: 13 {0.46} max. Knock-type*2: 8 {0.28} max.	Adhesive-type*1: 11 {0.38} max. Knock-type*2: 7 {0.25} max.	Adhesive-type*1: 10 {0.35} max. Knock-type*2: 6 {0.21} max.
Temporary spare tire							
Wheel	Size		15× 4T		16× 4T		17× 4T
	Offset	(mm {in})	45 {1.8}				40 {1.6}
	Pitch circle diameter	(mm {in})	114.3 {4.50}				
	Material		Steel				
Tire	Size		T115/70 D15		T125/70 D16		T125/70 D16
	Air pressure	(kPa {psi})	420 {60}				
Wheel and tire	Wheel and tire runout (mm {in})	Radial direction	2.0 {0.08} max.				
		Lateral direction	2.5 {0.10} max.				
	Tightening torque	(N·m {kgf·m, ft·lbf})	88.2—117.6 {9.00—11.99, 65.06—86.73}				

*1 . Total weight exceeds **160 g {5.65 oz}**.
*2 . One balance weight: **60 g {2.12 oz}** max. If the total weight exceeds **100 g {3.53 oz}** on one side, rebalance after moving the tire around on the rim. Do not use three or more balance weights.

WHEEL BALANCE ADJUSTMENT (ALUMINUM ALLOY WHEEL)

id021200801100

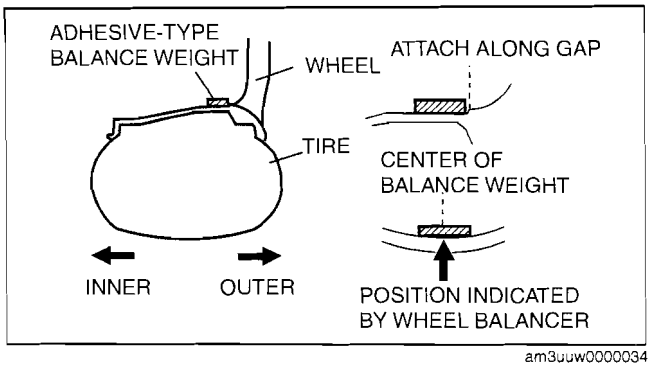
Caution
- **Adjust the outer wheel balance first, then the inner wheel balance.**
- **Be careful not to scratch the wheels.**

Adhesive-type Balance Weight (Outer)

1. Remove the old balance weight from the wheel.
2. Remove the double-sided adhesive tape remaining on the wheel, then clean and degrease the bonding area.
3. Set the wheel on a wheel balancer, measure the amount of unbalance and the position with the mode set for knock-type balance weight.
4. Multiply the amount of unbalance by **1.6** to obtain the balance weight value.

5. Select a balance weight closest to the weight value and attach the balance weight on the position (outer) indicated by the wheel balancer.

Example calculation of balance weight value
Indicated amount of unbalance: 23 g {0.81 oz}
23 g {0.81 oz}×1.6 = 36.8 g {1.30 oz}
Selected balance weight value: 35 g {1.24 oz}



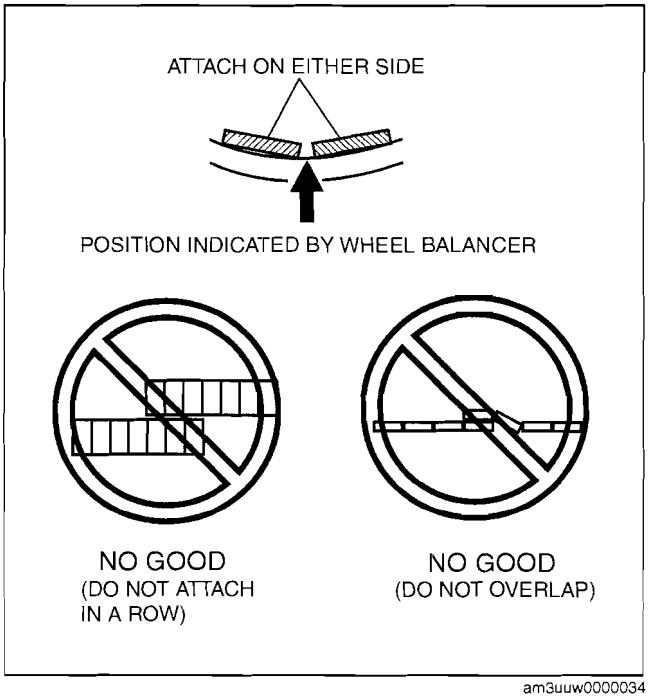
am3uuw0000034

Note
- When selecting a balance weight, select one closest to the calculated value.
  Example: **32.4 g {1.14 oz} = 30 g {1.06 oz}**

Caution
- **Use a genuine balance weight or equivalent (steel).**
- **When attaching the weight, press the weight with a force of 25 N {2.5 kgf, 5.5 lbf} per 5 g {0.2 oz} for 2 s or more.**

6. If attaching tow balance weights, position them so that each is on either side of the position indicated by the wheel balancer.

Caution
- **Do not attach weight balances in a row.**
- **Do not overlap the balance weights.**
- **Total weight must not exceed 160 g {5.65 oz}.**



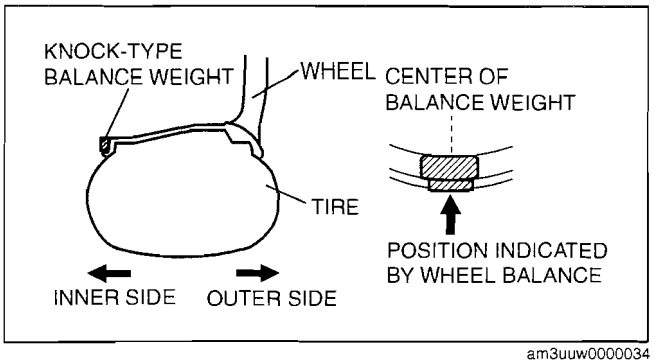
am3uuw0000034

Knock-type Balance Weight (Inner)

1. Measure the amount of unbalance with a wheel balancer.
2. Attach a weight corresponding to the measured weight value on the position (inner) indicated by the wheel balancer.

Caution

- **Do not attach three or more balance weights.**
- **One balance weight must not exceed 60 g {2.12 oz}, and a total of tow balance weights must not exceed 100 g {3.53 oz}.**



am3uuw0000034

Remaining Amount of Unbalance Confirmation

1. After installing the outer and inner balance weights, operate the wheel balancer again.
2. Confirm that the remaining unbalance does not exceed the following on either side.
   - If the remaining unbalance exceeds the specifications, adjust the wheel balance again.

Specifications

	Outer (Adhesive-type)	Inner (Knock-type)
15 inch wheel	14 g {0.49 oz}	9 g {0.31 oz}
16 inch wheel	13 g {0.46 oz}	8 g {0.28 oz}
17 inch wheel	11 g {0.38 oz}	7 g {0.25 oz}
18 inch wheel	10 g {0.35 oz}	6 g {0.21 oz}

TIRE PRESSURE ADJUSTMENT (WITH TPMS)

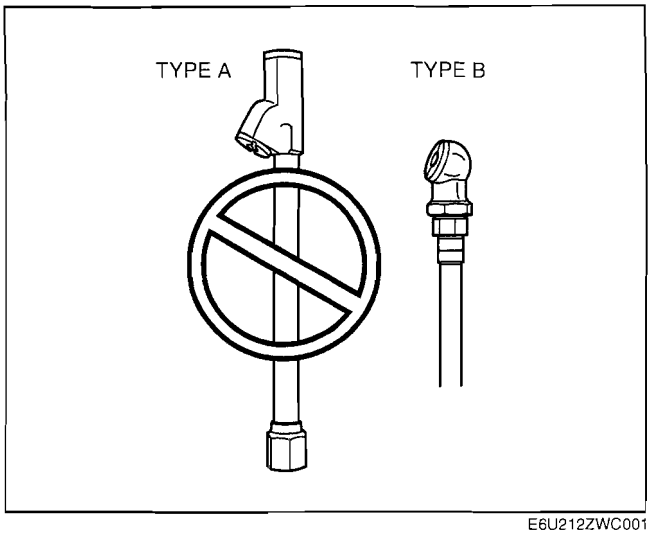
id021200800300

1. Use of a digital gauge is recommended for accurate measurement of the air pressure.
2. Tire pressure lowers gradually as time passes. Due to this, monthly air pressure inspection is recommended.
3. Perform tire pressure adjustment before driving. (When tires are cold.)
   - Tire pressure will increase after driving because the internal temperature of the tire is high. If tire pressure is adjusted to specifications when the internal temperature of the tire is high, tire pressure will decrease when the internal temperature of the tire decreases to the same level as ambient temperature. If the tire pressure is lower than the lower-limit pressure, the TPMS warning light may illuminate.
   - Even though the air pressure is adjusted to specifications, the indicated air pressure may be higher than the specified value when the internal temperature of the tire is higher than ambient temperature. (Example: Air pressure changes approx.**10 kPa {0.1 kgf/cm2, 1.5 psi}** when the temperature changes **10 degrees**)

Caution

- **In an area or a season with varying temperatures, tire pressure will change due to ambient temperature change. If the tire pressure is lower than the lower-limit pressure due to low ambient temperature, the TPMS warning light may illuminate. Adjust the pressure when the TPMS warning light illuminates.**
- **Do not tilt or use excessive side force when checking air pressure or inflating the tire with air. Which can provide enough leverage to easily bend or break the wheel unit.**

- **To prevent damage to the valve area of the wheel unit or pressure loss during air pressure adjustment, use a type B tool with a round end as shown in the figure, not a type A tool.**



E6U212ZWC001

WHEEL UNIT ID REGISTRATION

id021200800400

Note
- After the wheel unit replacement, registration of the wheel unit identification codes must be performed.
- ID registration can be done using the M-MDS, or not using the M-MDS.

Using M-MDS

1. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - This function is available for only the IDS (laptop PC).
     1. Select the "Body" tab.
     2. Select the "TPMS Functions".
     3. Select the "Wheel Unit ID Registration".
     4. Select the "WU_ID Registration".

Caution
- **If performing the procedure alone, never drive the vehicle while checking the M-MDS screen. When performing the ID registration, record each data on the screen before driving, and verify that the ID numbers have changed after driving.**

Note
- When the vehicle is driven, the four ID numbers in the bold cell of the chart change at the same time the ID registration finishes.

	WU 1	WU 2	WU 3	WU 4
ID Number (Stored)	0xAAAAAAAA	0xBBBBBBBB	0xCCCCCCCC	0xDDDDDDDD
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaaKPa	bbbKPa	cccKPa	dddKPa
Tire pressure (Candidate)	0KPa	0KPa	0KPa	0KPa

am5uuw0000043

2. Leave the vehicle with the engine off for **15 min or more**.
3. Verify that the TPMS warning light turns on and off in **0.5 s** cycles repeatedly.
4. Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min** to implement the wheel unit ID registration.

Note
- If the ID registration is not completed even after driving the vehicle for **10 min or more** at a speed of **25 km/h {15.5 mph} or more**, the TPMS warning light flashes.

5. Verify that the TPMS warning light turns off.

Note
- If the wheel unit ID registration cannot be performed after driving **10 min or more**, refer to the symptom troubleshooting procedure.

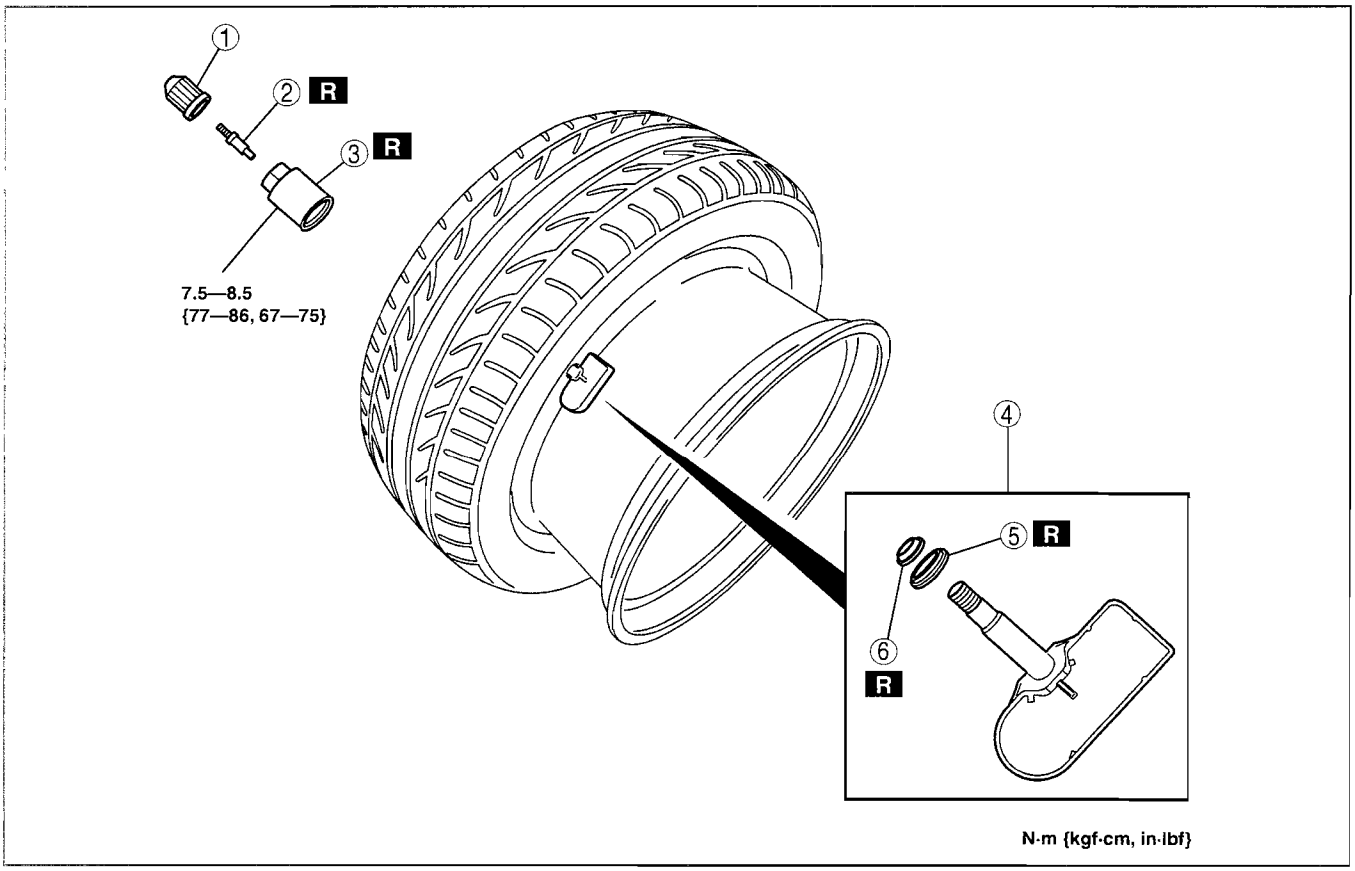
Without Using M-MDS
1. Turn the ignition switch to the ON position, then turn it off.
2. Leave the vehicle with the engine off for **15 min or more**.
3. Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **10 min or more**.
4. After driving for **10 min**, verify that the TPMS warning light does not flash and is not illuminated.

WHEEL UNIT REMOVAL/INSTALLATION

id021200800600

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. When replacing wheel unit (s), register the new wheel unit ID (s). (See 02-12-5 WHEEL UNIT ID REGISTRATION.)

Note
- If the wheel unit is replaced with a new one, the ID registration must be performed. When the ID registration is finished, the data for the new wheel unit is displayed on the M-MDS.



acxuuw00001040

1	Valve cap
2	Valve core (See 02-12-7 Valve Core Removal Note.)
3	Valve nut and washer

4	Wheel unit (See 02-12-7 Wheel Unit Removal Note.) (See 02-12-7 Wheel Unit Installation Note.)
5	Seal washer
6	Seal

Valve Core Removal Note

1. Remove the valve core of the wheel unit, and bleed the air from the tire.

Wheel Unit Removal Note

1. Push the tire valve completely into the tire.

Caution

- **Breaking the tire bead with the wheel unit installed normally could damage the unit. Be sure to always push the wheel unit so that it is completely inside the tire to prevent any damage.**

2. Position the shoe (bead breaker) of the tire changer **10—20 mm {0.40—0.78 in}** from the outer edge of the wheel, and break both tire beads.
3. Remove the bead from one side of the wheel.
4. Remove the wheel unit.

Wheel Unit Installation Note

1. Insert the wheel unit valve into the valve hole so that the polyurethane foam side faces the rim.

Note

- Maintain the wheel unit in contact with the rim, then start manually to screw the valve nut for a few turns.

2. Install the nut from the outer side of the wheel.
3. Tighten the valve nut slowly **(15 rpm max.)** to **8.0 N·m {82 kgf·cm, 71 in·lbf}** in one rotation.

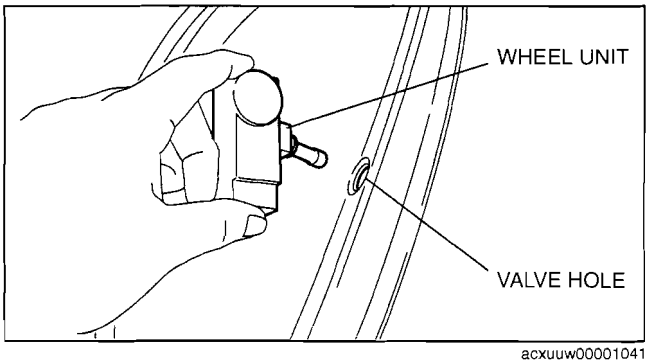
Caution

- **Do not retighten the valve nut after the initial operation.**

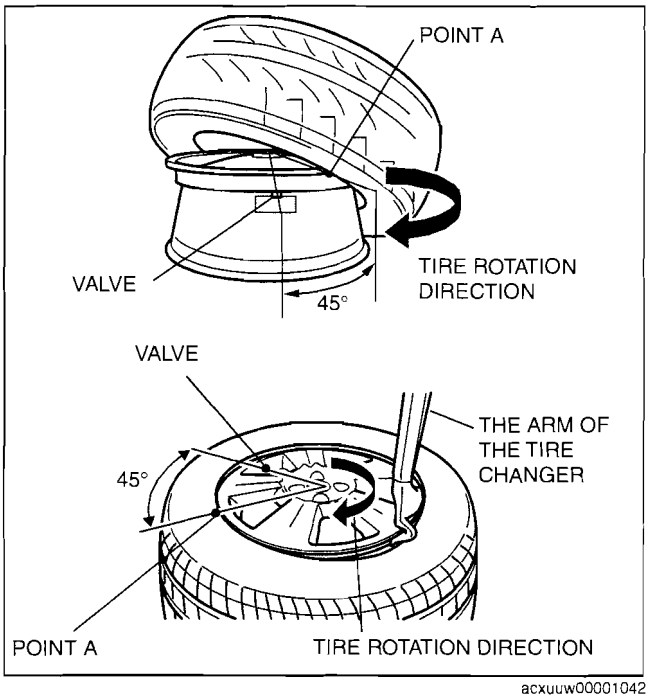
4. Set the tire changer so that it is **45°** away (point A) from the valve hole.

Caution

- **Do not position the tire changer near the tire valve to avoid any damage to the wheel unit.**



acxuuw00001041

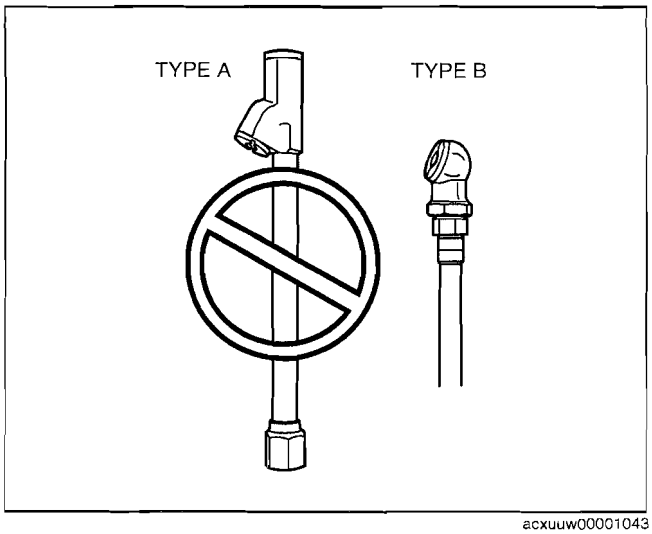


acxuuw00001042

5. Fill the tire with air and verify the valve nut tightening torque.

Caution

- **To prevent damage to the valve area of the wheel unit or charging loss during air pressure adjustment, use a type B tool with a round end as shown in the figure, not a type A tool.**

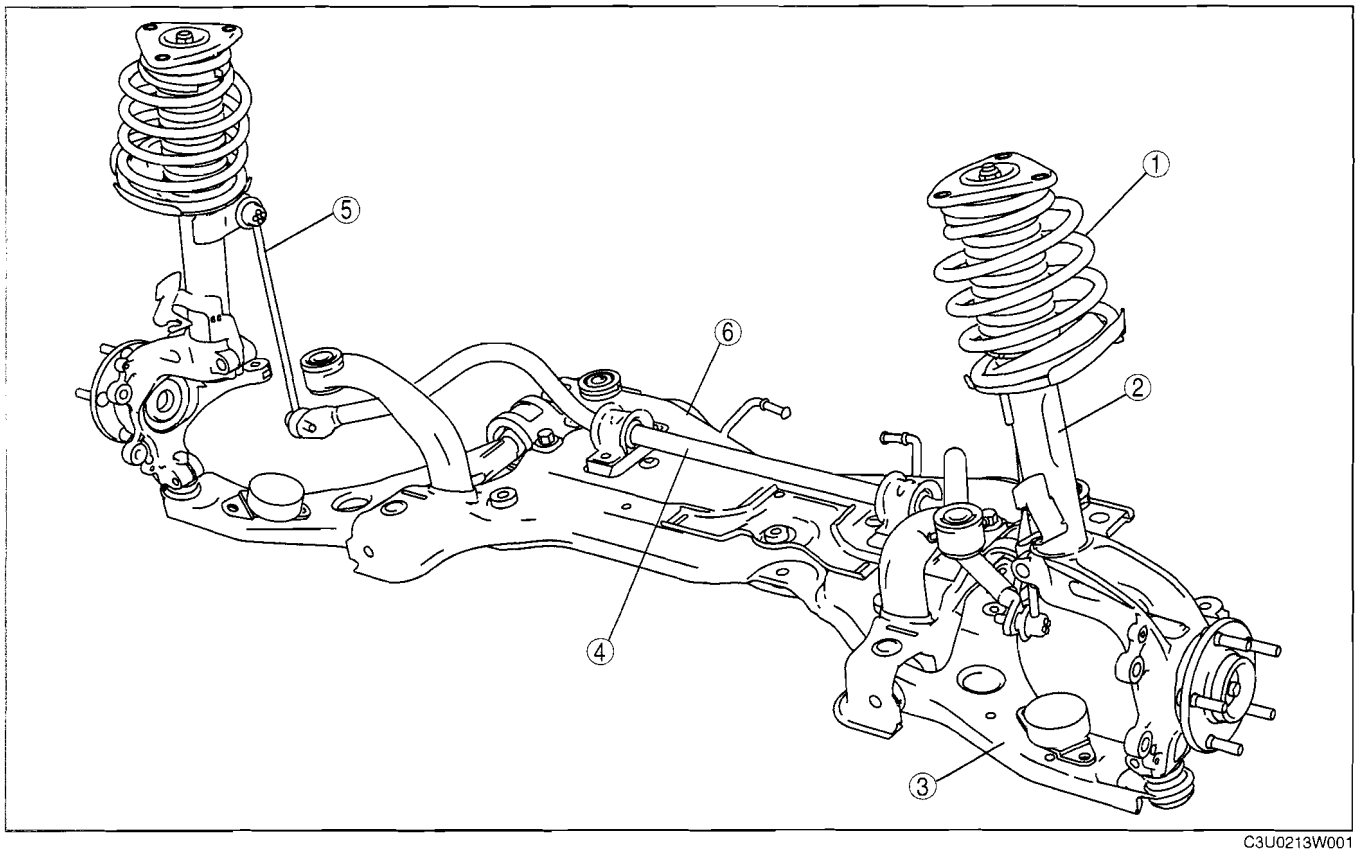


acxuuw00001043

02-13 FRONT SUSPENSION

FRONT SUSPENSION LOCATION INDEX

id021300800100



C3U0213W001

1	Front shock absorber and coil spring (See 02-13-3 FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.) (See 02-13-6 FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY.)
2	Front shock absorber (See 02-13-8 FRONT SHOCK ABSORBER INSPECTION.) (See 02-13-8 FRONT SHOCK ABSORBER DISPOSAL.)
3	Front lower arm (See 02-13-9 FRONT LOWER ARM REMOVAL/INSTALLATION.) (See 02-13-10 FRONT LOWER ARM INSPECTION.)
4	Front stabilizer (See 02-13-11 FRONT STABILIZER REMOVAL/INSTALLATION.)
5	Stabilizer control link (See 02-13-14 STABILIZER CONTROL LINK INSPECTION.)
6	Front crossmember (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)

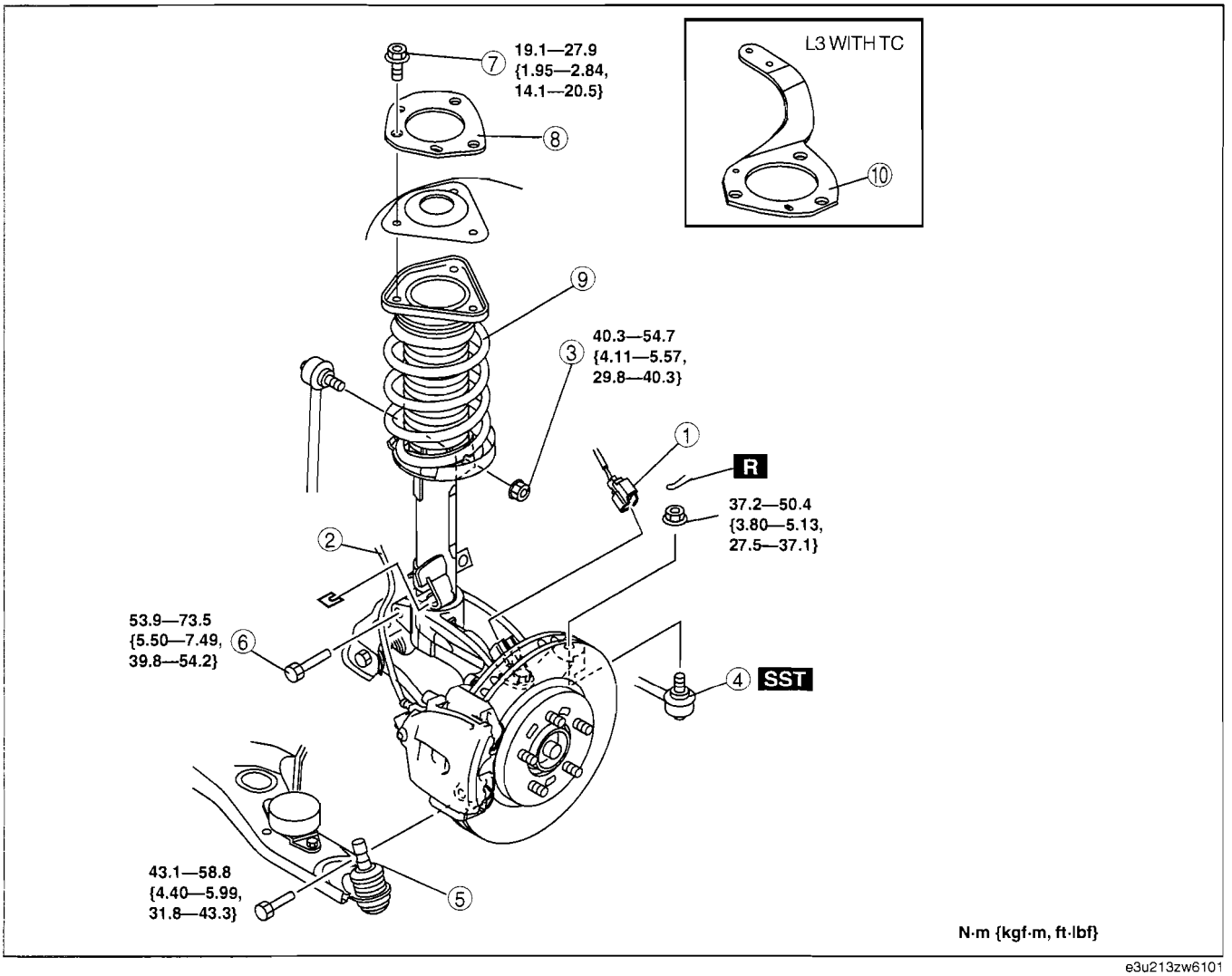
FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION

id021300801400

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor wiring harness connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the total wheel alignment if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



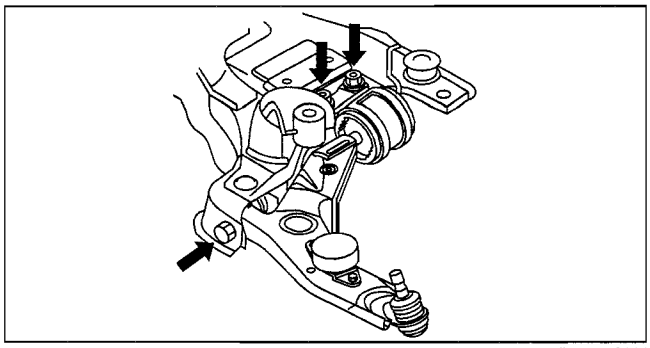
e3u213zw6101

1	ABS wheel-speed sensor wiring harness connector
2	Brake hose
3	Stabilizer control link upper nut
4	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
5	Front lower arm ball joint (See 02-13-4 Front Lower Arm Ball Joint Removal Note.) (See 02-13-5 Front Lower Arm Ball Joint Installation Note.)
6	Shock absorber lower bolt

7	Shock absorber upper bolt
8	Stiffener (See 02-13-5 Stiffener Installation Note.)
9	Shock absorber and coil spring (See 02-13-4 Shock Absorber and Coil Spring Removal Note.) (See 02-13-4 Shock Absorber and Coil Spring Installation Note.)
10	Strut plate (L3 with TC)

Front Lower Arm Ball Joint Removal Note

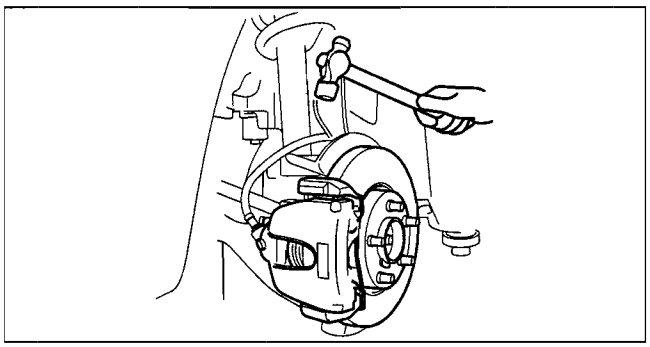
1. Loosen the installation bolt on the inner side of the front lower arm.
2. Separate the lower arm ball joint.



aaxjjw00002114

Shock Absorber and Coil Spring Removal Note

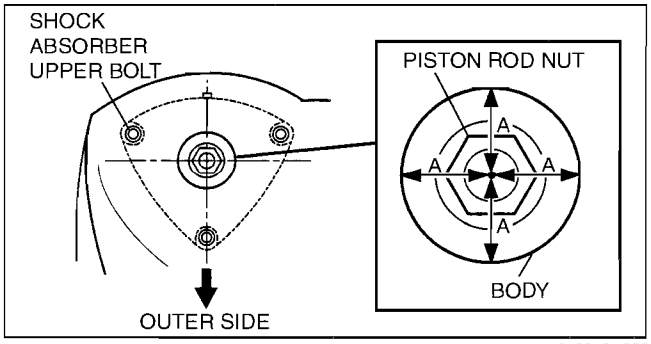
1. Loosen the front lower arm inner bolt.
2. Separate the front lower arm ball joint.
3. Separate the shock absorber from the wheel hub, steering knuckle component by tapping the upper part of the steering knuckle with a hammer.



am3uuw0000041

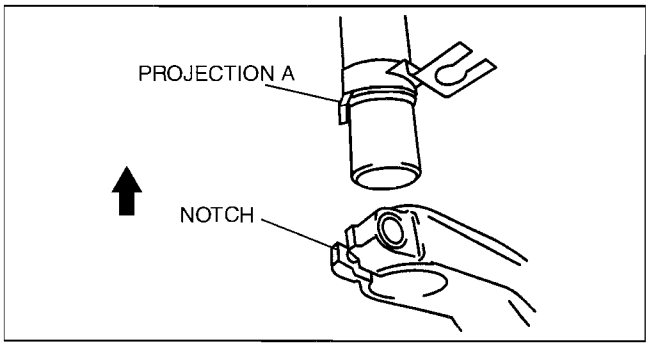
Shock Absorber and Coil Spring Installation Note

1. Align the piston rod nut with the center of the part where the shock absorber is installed by positioning the piston rod nut with lengths A all the same, and tighten the shock absorber upper bolts.
2. Align the knuckle notch with projection A on the lower side of the shock absorber.



c3u0213w006

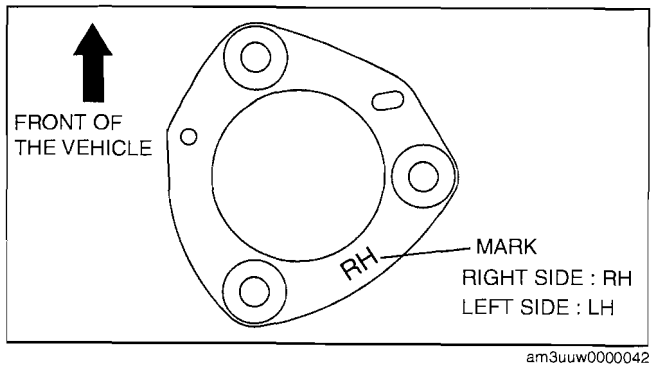
3. Raise the front lower arm using a jack and install the shock absorber and coil spring.



am3uuw0000041

Stiffener Installation Note

1. Install the stiffener so that the mark (RH or LH) faces upward.



am3uuw0000042

Front Lower Arm Ball Joint Installation Note

1. Tighten the installation bolts.

Tightening torque

- **Front side: 130.0—150.0 N·m {13.26—15.29 kgf·m, 95.9—110.5 ft·lbf}**
- **Rear side: 75.5—102.0 N·m {7.70—10.4 kgf·m, 55.7—75.2 ft·lbf}**

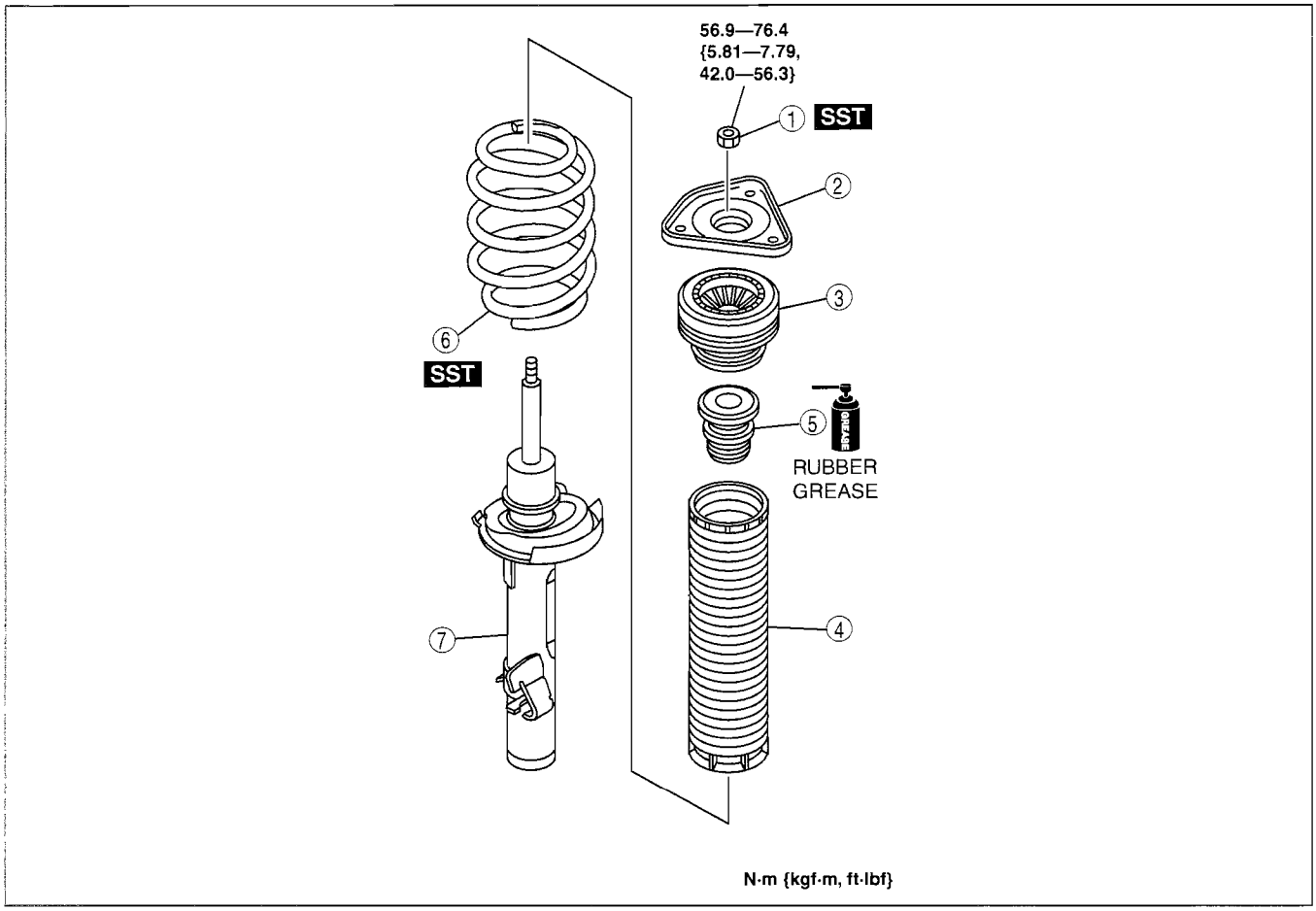
FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY

id021300801300

Warning

- **Removing/installing the shock absorber and coil spring is dangerous. The shock absorber and coil spring could fly off and cause serious injury or death, and damage the vehicle.**

1. Remove the front shock absorber and coil spring. (See 02-13-3 FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



e3u213zw6102

1	Piston rod nut (See 02-13-7 Piston Rod Nut Removal Note.)
2	Mounting rubber
3	Bearing (See 02-13-8 Bearing Installation Note.)

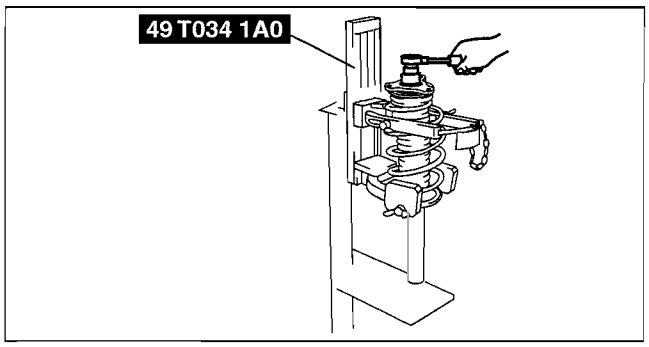
4	Dust boot (See 02-13-7 Dust Boot Installation Note.)
5	Bound stopper
6	Coil spring (See 02-13-7 Coil Spring Installation Note.)
7	Front shock absorber

Piston Rod Nut Removal Note

Warning

- **Before removing the piston rod nut, secure the shock absorber and coil spring in the SSTs. Otherwise, the coil spring could fly off under tremendous pressure and cause serious injury or death, or damage to vehicle parts.**

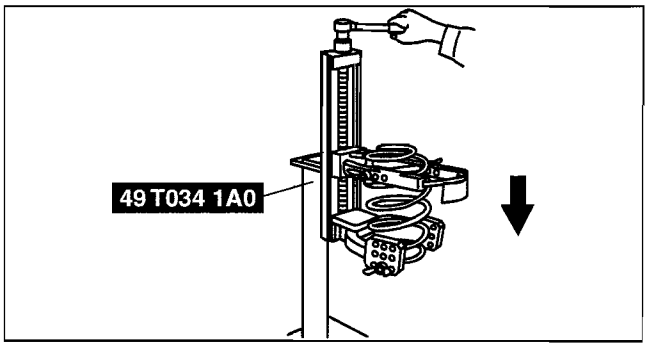
1. Install the shock absorber and coil spring to the **SSTs** using a piece of cloth in order to prevent the coil spring from being scratched.
2. Compress the coil spring using the **SSTs** and remove the piston rod nut.



am3uuw0000087

Coil Spring Installation Note

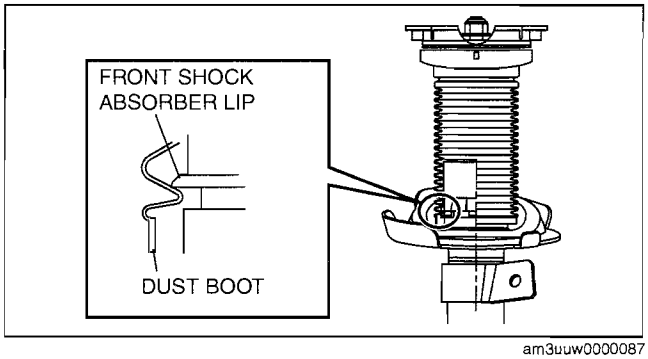
1. Compress the coil spring using the **SSTs**.
2. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.



am3uuw0000087

Dust Boot Installation Note

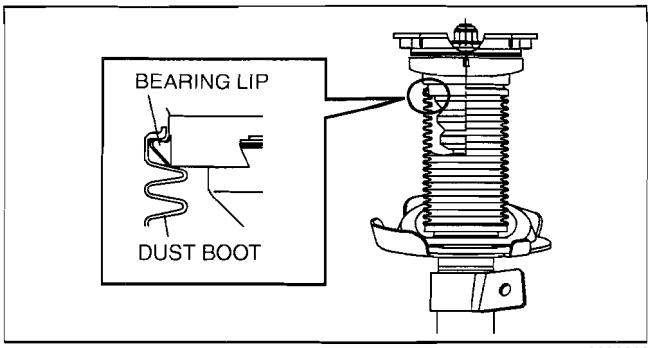
1. Install the dust boot by hooking the bottom edge over the shock absorber lip.



am3uuw0000087

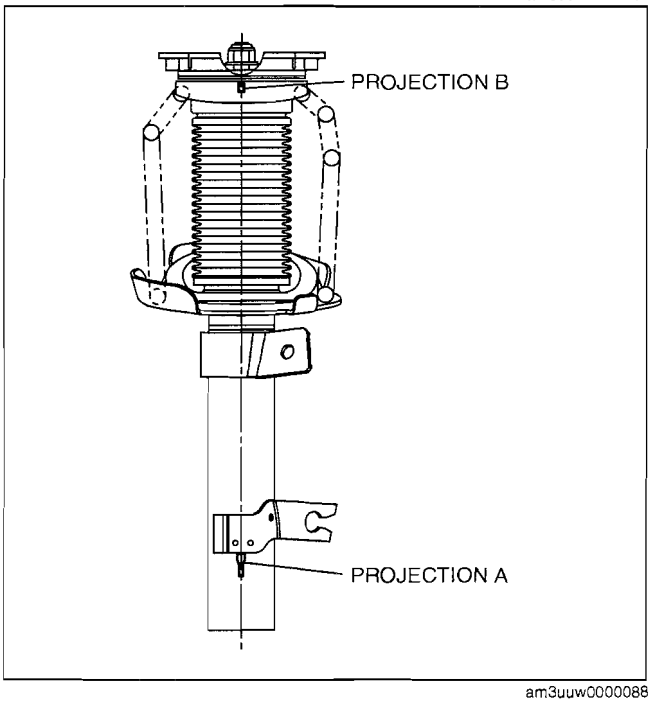
Bearing Installation Note

1. Install the bearing by hooking the upper end of the dust boot to the bearing lip.



am3uuw0000088

2. Align the projection A on the lower part of the shock absorber with the bearing projection B.



am3uuw0000088

FRONT SHOCK ABSORBER INSPECTION

id021300800800

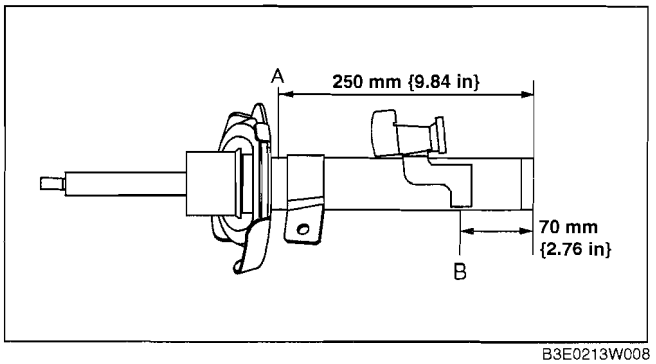
1. Remove the front shock absorber.
2. Inspect for damage and oil leakage.
3. Compress and extend the shock absorber piston rod **at least three times** at a steady rate. **From the fourth** compression stroke, verify that the operational force does not change and that there is no unusual noise.
   - If there is any malfunction, replace the shock absorber.

FRONT SHOCK ABSORBER DISPOSAL

id021300800900

1. Place the shock absorber on a level surface or with the piston pointing downwards.
2. Drill a **2—3 mm {0.08—0.11 in}** hole at the point A shown in the figure so that the gas can escape.

   Warning
   - **Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized and could spray metal chips into the eyes and face.**



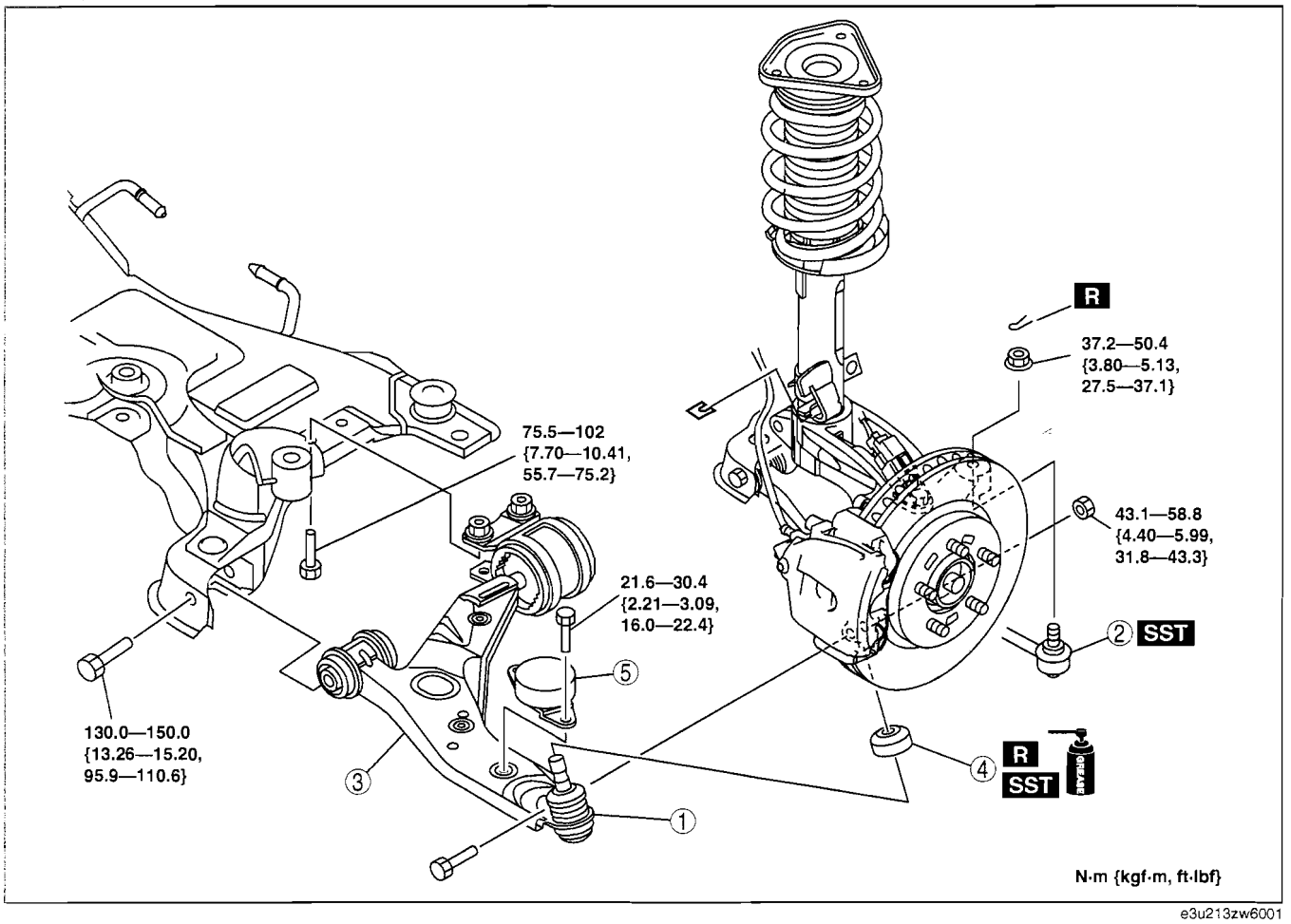
B3E0213W008

3. Drill a **2—3 mm {0.08—0.11 in}** hole at the point B shown in the figure to drain the oil.
4. Turn the hole made in Step 3 downwards and drain the oil by pumping the piston rod up and down several times.
5. Cut off the end of the shock absorber.
6. Dispose of waste oil according to local waste disposal laws.

FRONT LOWER ARM REMOVAL/INSTALLATION

id021300800600

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



e3u213zw6001

1	Front lower arm ball joint
2	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)

3	Front lower arm (See 02-13-9 Front Lower Arm Removal Note.) (See 02-13-10 Front Lower Arm Installation Note.)
4	Dust boot (See 02-13-10 Dust Boot Installation Note.)
5	Dynamic damper

Front Lower Arm Removal Note

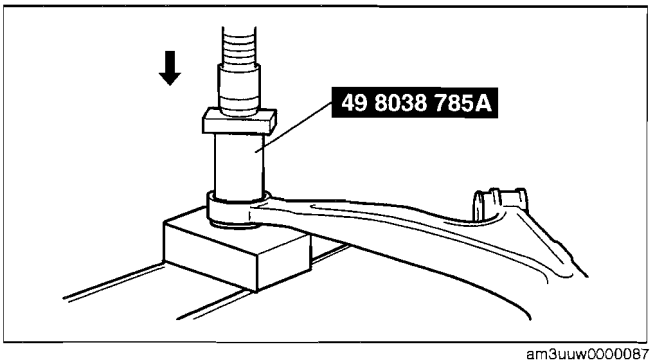
Note

- When working on the right side of vehicles, move the engine and transaxle slightly towards the front side of the vehicle so that the engine does not interfere with the removal of the lower arm rear side bolt.

1. Remove the No.1 engine mount center bolt.
2. Move the engine and transaxle slightly towards the front side of the vehicle.
3. Remove the front lower arm rear side bolt.
4. Remove the front lower arm.

Dust Boot Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Press the boot onto the ball joint using the **SST**.
4. Wipe away the excess grease.



am3uuw0000087

Front Lower Arm Installation Note

Caution

- **Install the front lower arm according to the following procedures for optimal installation. Tighten the lower arm installation bolt properly when the vehicle is lifted.**

1. Temporarily install the front lower arm.
2. Install the No.1 engine mount.

Tightening torque
93.1—116.6 N·m {9.50—11.88 kgf·m, 68.67—85.99 ft·lbf}

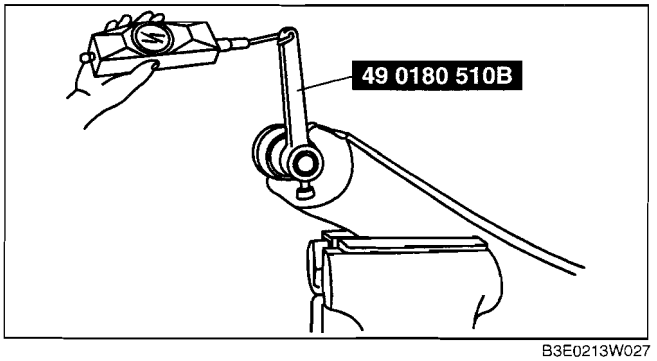
3. Tighten the front lower arm rear side bolt.
4. Tighten the front lower arm front side bolt.
5. Tighten the nut (front lower arm ball joint).

FRONT LOWER ARM INSPECTION

id021300800700

1. Remove the lower arm from the vehicle.
2. Inspect the arm for bending or damage, and the ball joint for excessive looseness.
   - If there is any malfunction, replace the lower arm.
3. Rotate the ball joint stud **5 times**. Install the **SST** to the ball joint stud, measure the rotational torque using a pull scale.
   - If not within the specification, replace the lower arm.

Rotational torque
1.0—4.9 N·m {11—49 kgf·cm, 9—43 in·lbf}
Pull scale reading [10—49 N {1.1—4.9 kgf, 3—10 lbf}]

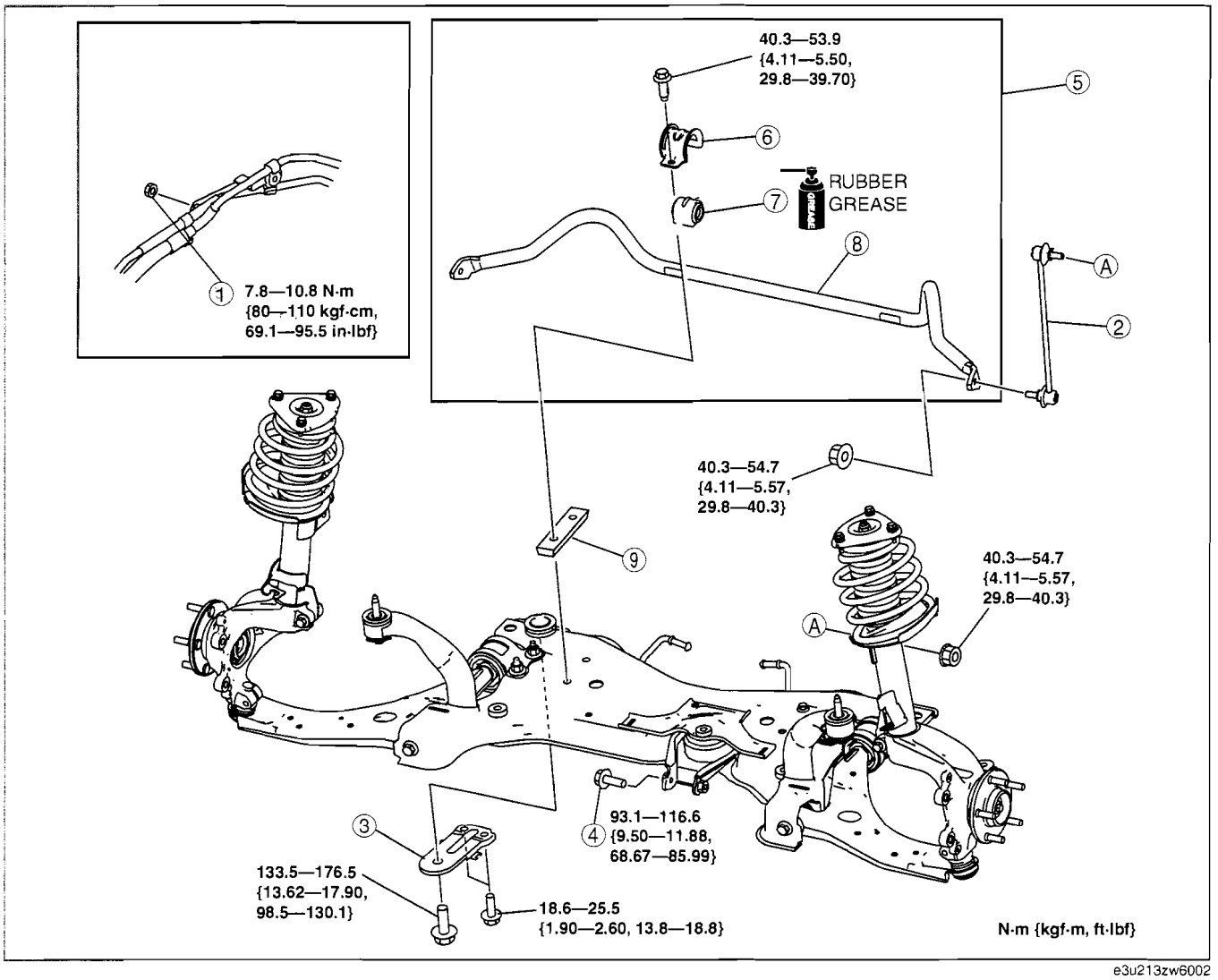


B3E0213W027

FRONT STABILIZER REMOVAL/INSTALLATION

id021300800400

1. Detach the steering shaft from the steering gear and linkage. (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



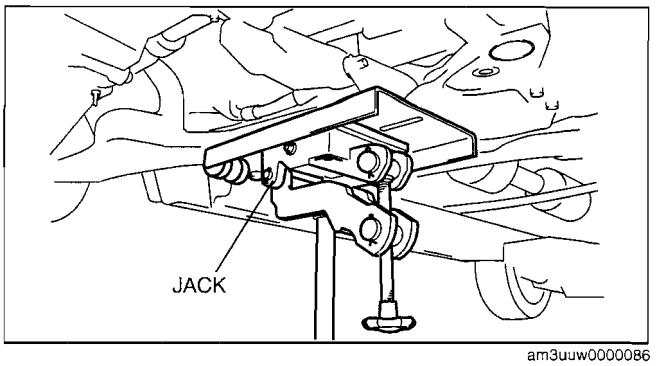
e3u213zw6002

1	Power steering pipe bracket
2	Stabilizer control link
3	Front crossmember bracket (See 02-13-12 Front Crossmember Bracket Removal Note.)
4	No.1 engine mount center bolt
5	Front stabilizer component (See 02-13-12 Front Stabilizer Component Removal Note.) (See 02-13-14 Front Stabilizer Component Installation Note.)

6	Stabilizer bracket (See 02-13-12 Stabilizer Bracket Removal Note.) (See 02-13-13 Stabilizer Bracket Installation Note.)
7	Stabilizer bushing (See 02-13-13 Stabilizer Bushing Installation Note.)
8	Front stabilizer
9	Stabilizer plate

Front Crossmember Bracket Removal Note

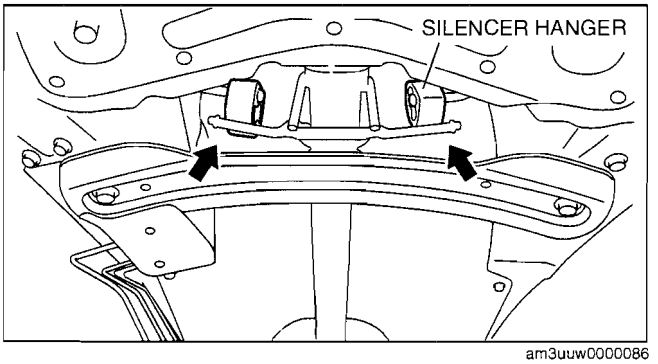
1. Support the front crossmember using a jack.
2. Remove the front crossmember brackets.



am3uuw0000086

Front Stabilizer Component Removal Note

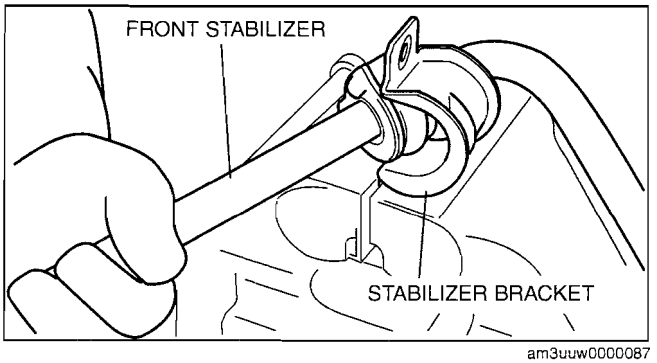
1. Detach the silencer hangers on the middle pipe from the front crossmember.
2. Lower the front crossmember slowly **approx. 90 mm {3.5 in}** and remove the front stabilizer component.



am3uuw0000086

Stabilizer Bracket Removal Note

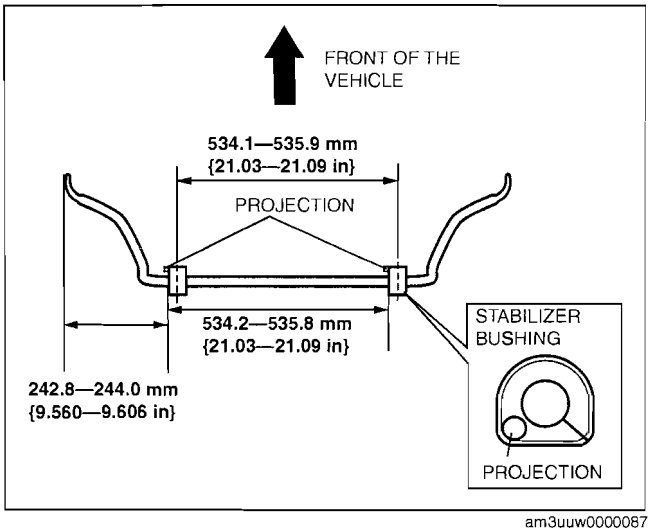
1. Secure the stabilizer bracket flange using a vise.
2. Remove the front stabilizer.



am3uuw0000087

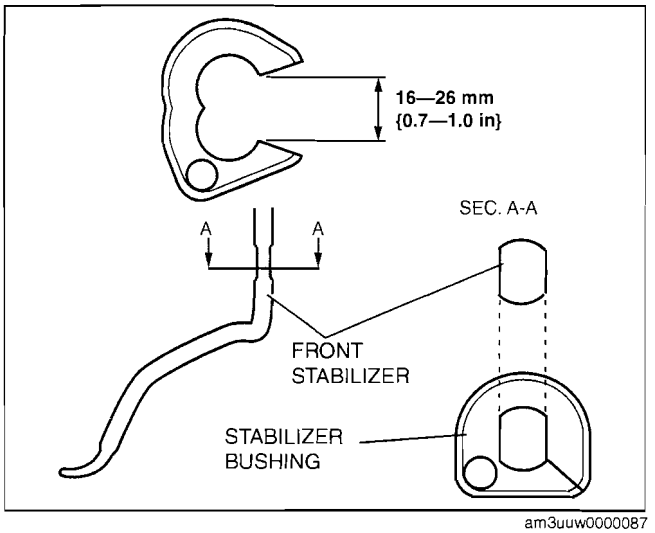
Stabilizer Bushing Installation Note

1. Verify the installation direction of the stabilizer bushing.



am3uuw0000087

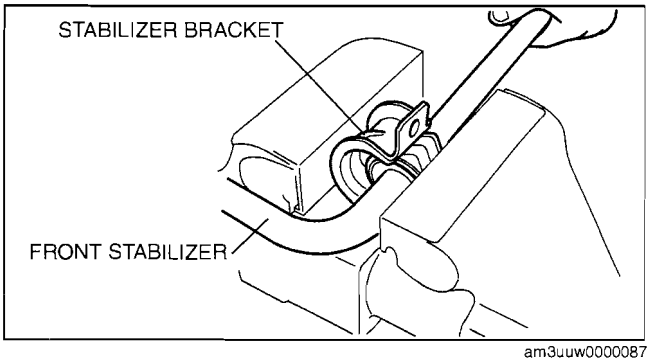
2. Widen the stabilizer bushing opening **16—26 mm {0.7—1.0 in}** and install the bushing to the front stabilizer as shown in the figure.



am3uuw0000087

Stabilizer Bracket Installation Note

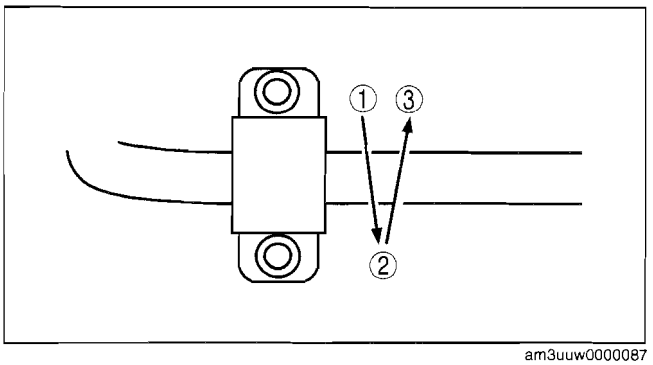
1. Apply grease to the stabilizer bushing.
2. Install the stabilizer bracket using a vise.



am3uuw0000087

Front Stabilizer Component Installation Note

1. Tighten the bolts in order indicated in the figure.



am3uuw0000087

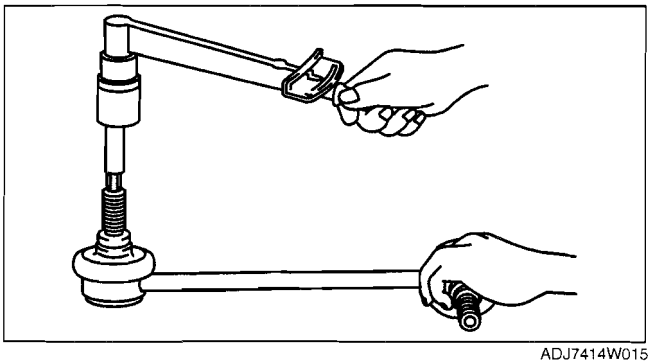
STABILIZER CONTROL LINK INSPECTION

id021300800500

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending or damage. If there is any malfunction, replace the stabilizer control link.
3. Rotate the ball joint stud **10 times** and shake it side to side **10 times**.
4. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.

Stabilizer control link ball joint rotational torque
0.2—0.9 N·m {3—9 kgf·cm, 2—7 in·lbf}

- If not within the specification, replace the stabilizer control link.



ADJ7414W015

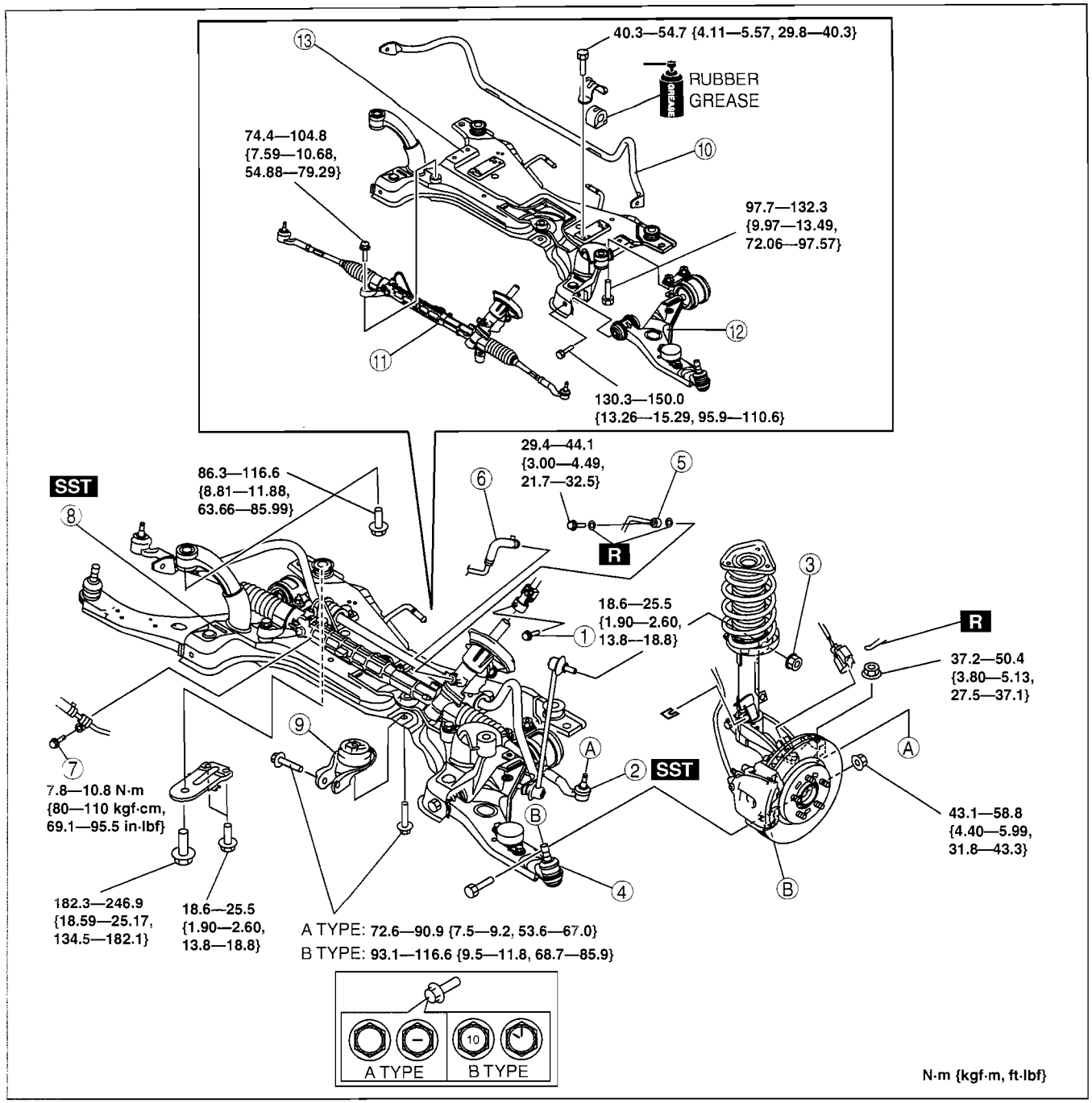
FRONT CROSSMEMBER REMOVAL/INSTALLATION

id021300801000

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor wiring harness connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



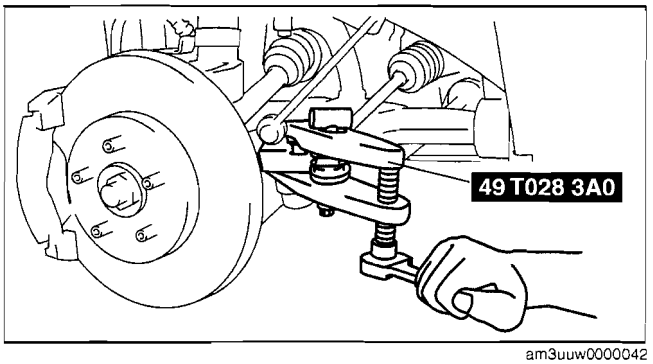
e3e213zsi997

1	Bolt (intermediate shaft)
2	Tie-rod end ball joint (See 02-13-16 Tie-rod End Ball Joint Removal Note.)
3	Stabilizer control link upper nut
4	Lower arm ball joint
5	Pressure pipe (gear side)
6	Return hose (gear side)
7	Bolt

8	Front crossmember component, steering gear and linkage component (See 02-13-16 Front Crossmember Component, Steering Gear and Linkage Component Removal Note.) (See 02-13-16 Front Crossmember Component, Steering Gear and Linkage Component Installation Note.)
9	No.1 engine mount rubber
10	Front stabilizer
11	Steering gear and linkage
12	Front lower arm
13	Front crossmember

Tie-rod End Ball Joint Removal Note

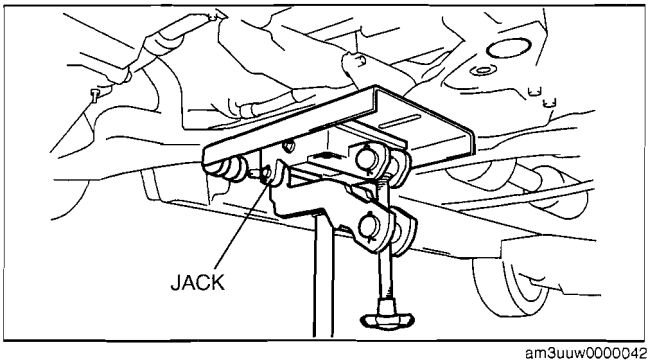
1. Remove the tie-rod end locknut.
2. Detach the tie-rod end from the steering knuckle using the **SST**.



am3uuw0000042

Front Crossmember Component, Steering Gear and Linkage Component Removal Note

1. Remove the front crossmember, front stabilizer, lower arm, and steering gear as a single unit using a transmission jack.

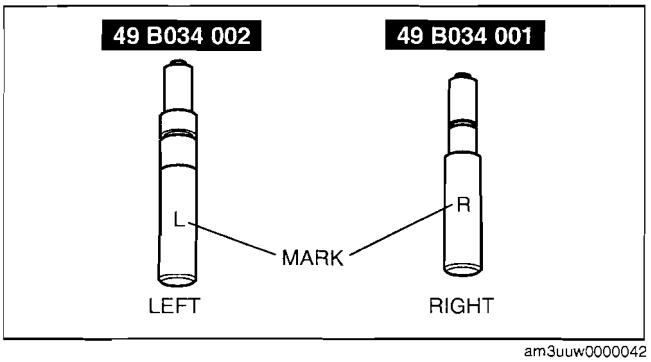


am3uuw0000042

Front Crossmember Component, Steering Gear and Linkage Component Installation Note

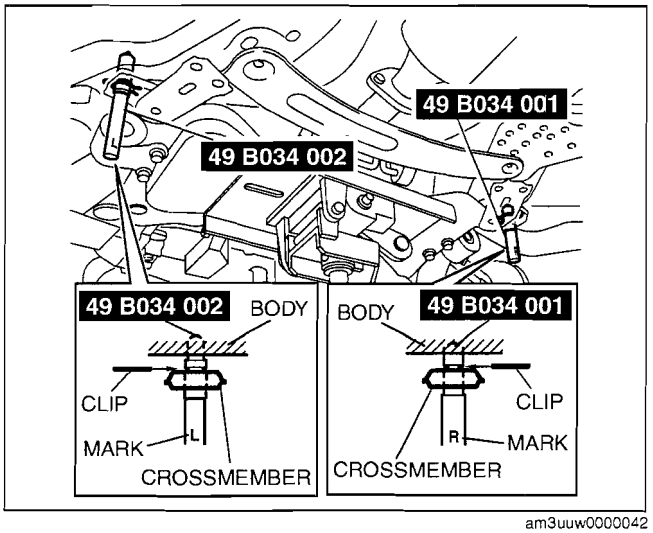
1. Verify the left and right identification marks and install the positioning **SST** to the front crossmember.

   Note
   - Verify the identification marks before installation because the left and right parts of the **SST** have different shapes.



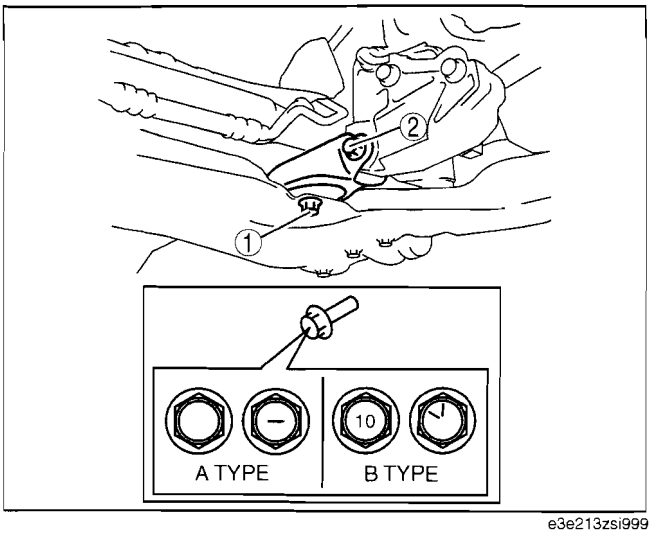
am3uuw0000042

2. Raise the transmission jack gradually and install the front crossmember to the vehicle. At this point verify that the **SST** is securely inserted in the positioning holes on the body.
3. Tighten the front crossmember installation bolts and nuts.



am3uuw0000042

4. Tighten the No.1 engine mount rubber installation bolt.



e3e213zsi999

Caution
- **When installing the No.1 engine mount, tighten the bolts in order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

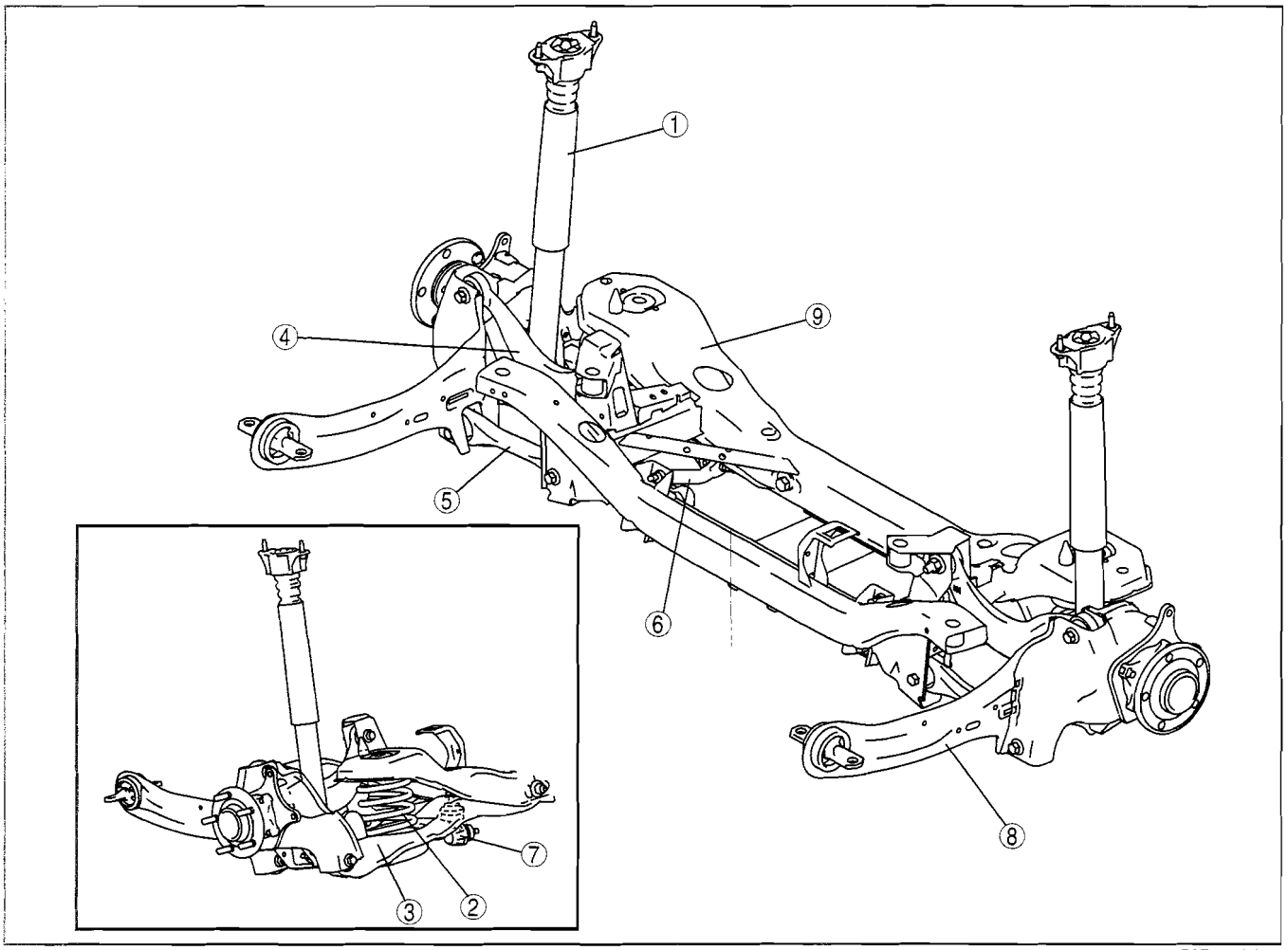
Bolt length (measured from below the head)
Front crossmember side: 62 mm {2.441 in}
No.1 engine mount bracket side: 65 mm {2.559 in}

Tightening torque
A type: 72.6—90.9 N·m {7.5—9.2 kgf·m, 53.6—67.0 ft·lbf}
b type: 93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

02-14 REAR SUSPENSION

REAR SUSPENSION LOCATION INDEX

id021400800400



B3E0214W001

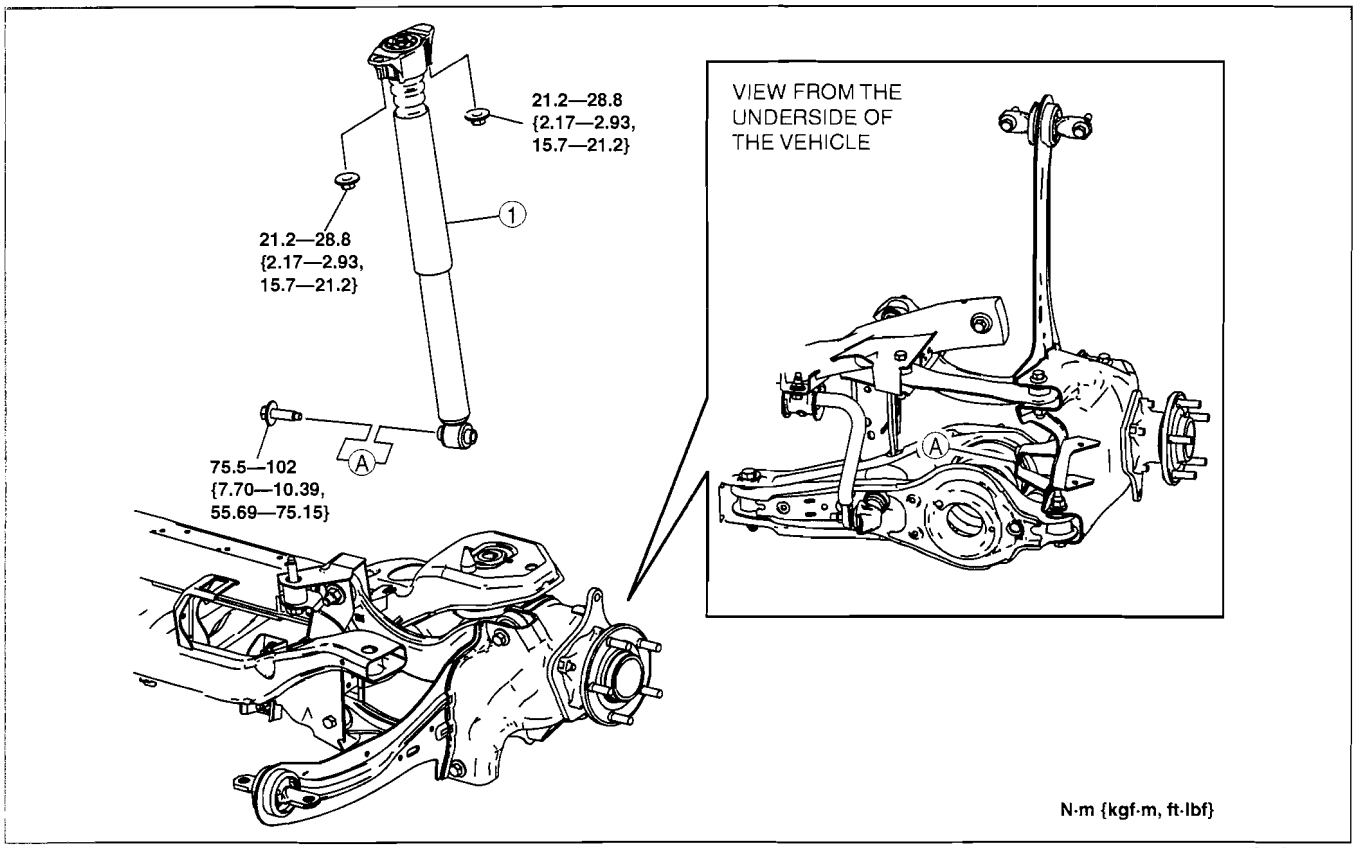
1	Rear shock absorber (See 02-14-3 REAR SHOCK ABSORBER REMOVAL/INSTALLATION.) (See 02-14-3 REAR SHOCK ABSORBER INSPECTION.) (See 02-14-3 REAR SHOCK ABSORBER DISPOSAL.)
2	Rear coil spring (See 02-14-4 REAR COIL SPRING REMOVAL/ INSTALLATION.)
3	Rear lower arm (See 02-14-5 REAR LOWER ARM REMOVAL/ INSTALLATION.)
4	Rear upper arm (See 02-14-7 REAR UPPER ARM REMOVAL/ INSTALLATION.)

5	Rear lateral link (See 02-14-6 REAR LATERAL LINK REMOVAL/ INSTALLATION.)
6	Rear stabilizer (See 02-14-10 REAR STABILIZER REMOVAL/ INSTALLATION.)
7	Stabilizer control link (See 02-14-12 STABILIZER CONTROL LINK INSPECTION.)
8	Rear trailing link (See 02-14-8 REAR TRAILING LINK REMOVAL/ INSTALLATION.)
9	Rear crossmember (See 02-14-12 REAR CROSSMEMBER REMOVAL/ INSTALLATION.)

REAR SHOCK ABSORBER REMOVAL/INSTALLATION

id021400801300

1. Remove in the order indicated in the table.



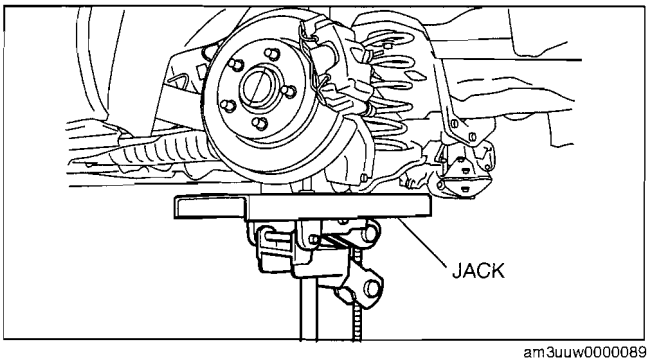
e3u214zw6005

1	Rear shock absorber (See 02-14-3 Rear Shock Absorber Removal Note.)

2. Install in the reverse order of removal.

Rear Shock Absorber Removal Note

1. Support the rear axle using a jack.
2. Remove the rear shock absorber.



am3uuw0000089

REAR SHOCK ABSORBER INSPECTION

id021400801400

1. Inspect in the same way as the front shock absorber.
   (See 02-13-8 FRONT SHOCK ABSORBER INSPECTION.)

REAR SHOCK ABSORBER DISPOSAL

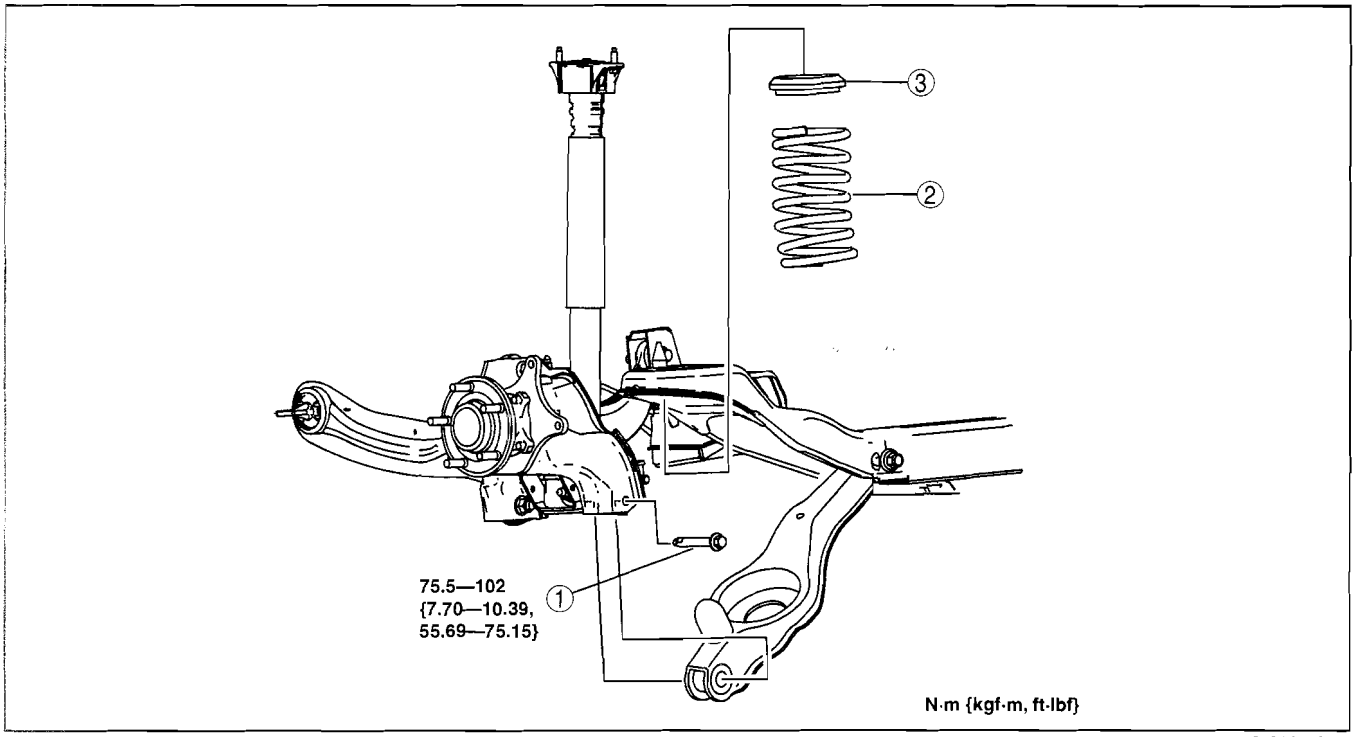
id021400801500

1. Dispose of the rear shock absorber in the same way as the front shock absorber.
   (See 02-13-8 FRONT SHOCK ABSORBER DISPOSAL.)

REAR COIL SPRING REMOVAL/INSTALLATION

id021400800700

1. Remove the rear stabilizer. (See 02-14-10 REAR STABILIZER REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)



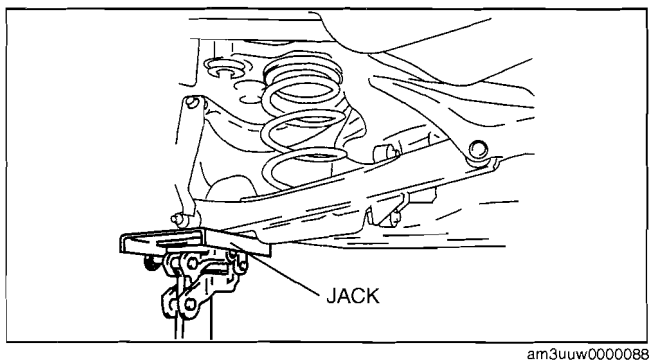
e3u214zw6004

1	Rear lower arm outer bolt (See 02-14-4 Rear Lower Arm Outer Bolt Removal Note.)

2	Rear coil spring (See 02-14-5 Rear Coil Spring Installation Note.)
3	Upper spring seat rubber

Rear Lower Arm Outer Bolt Removal Note

1. Support the rear lower arm using a jack.
2. Loosen the rear lower arm inner bolt.
3. Remove the rear lower arm outer bolt.



am3uuw0000088

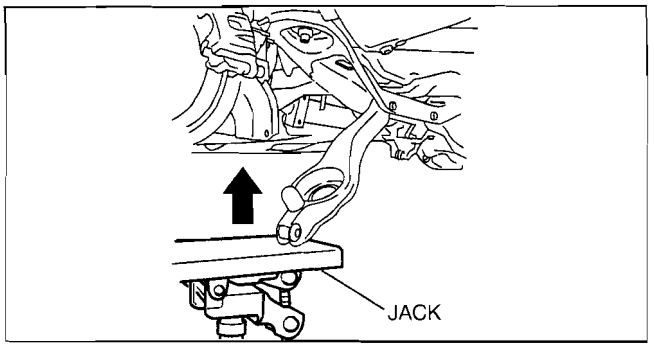
Rear Coil Spring Installation Note

1. Position the jack under the rear lower arm and jack up slowly.

Warning

- **Installing the coil spring is dangerous. The coil spring could fly off and cause serious injure or death, and damage the vehicle.**

2. Align the upper end of the rear coil spring with the step of the upper spring seat rubber.
3. Align the lower end of the rear coil spring with the step of the lower spring seat rubber.
4. Install the lower arm outer bolt.

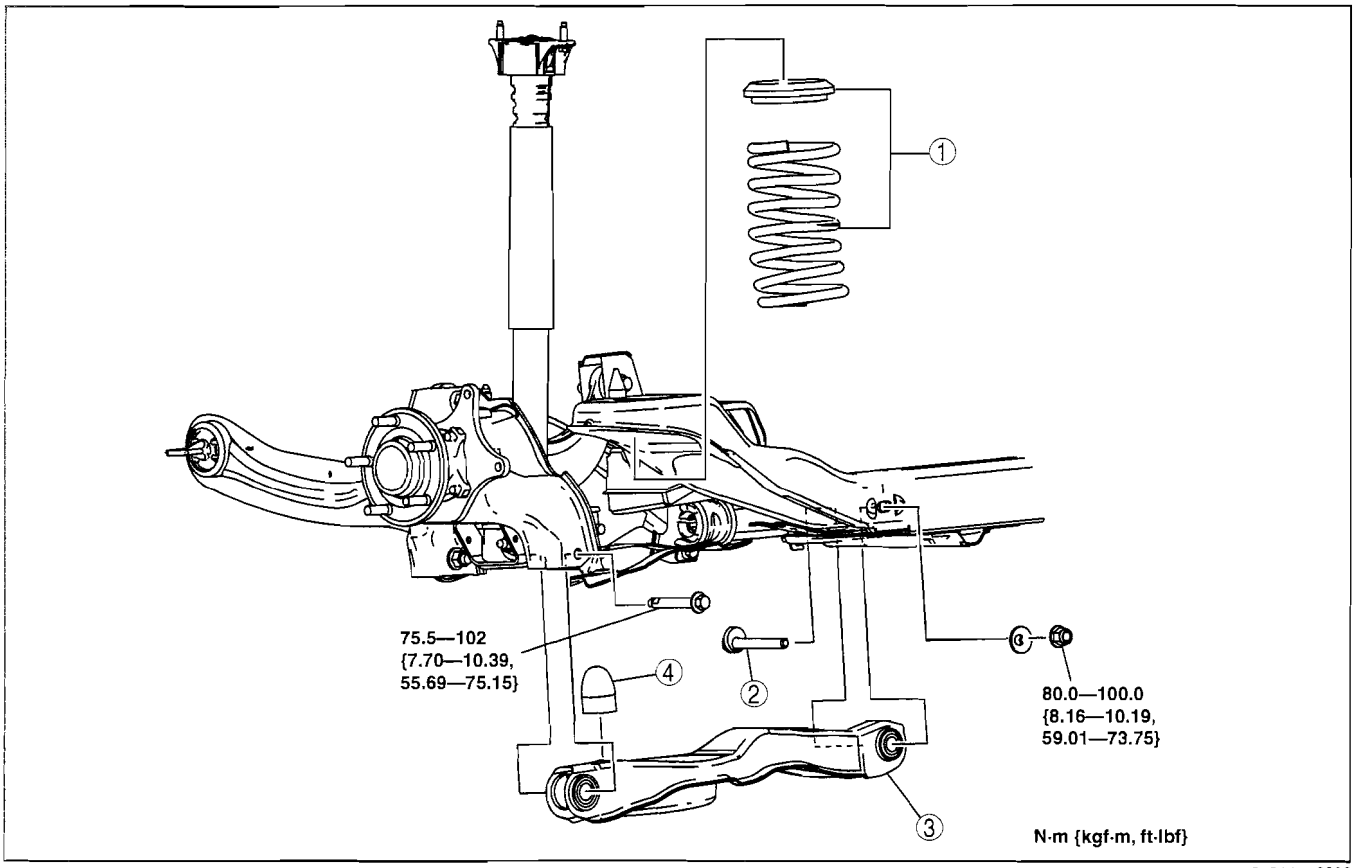


am3uuw0000088

REAR LOWER ARM REMOVAL/INSTALLATION

id021400800900

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)



e3u214zw6006

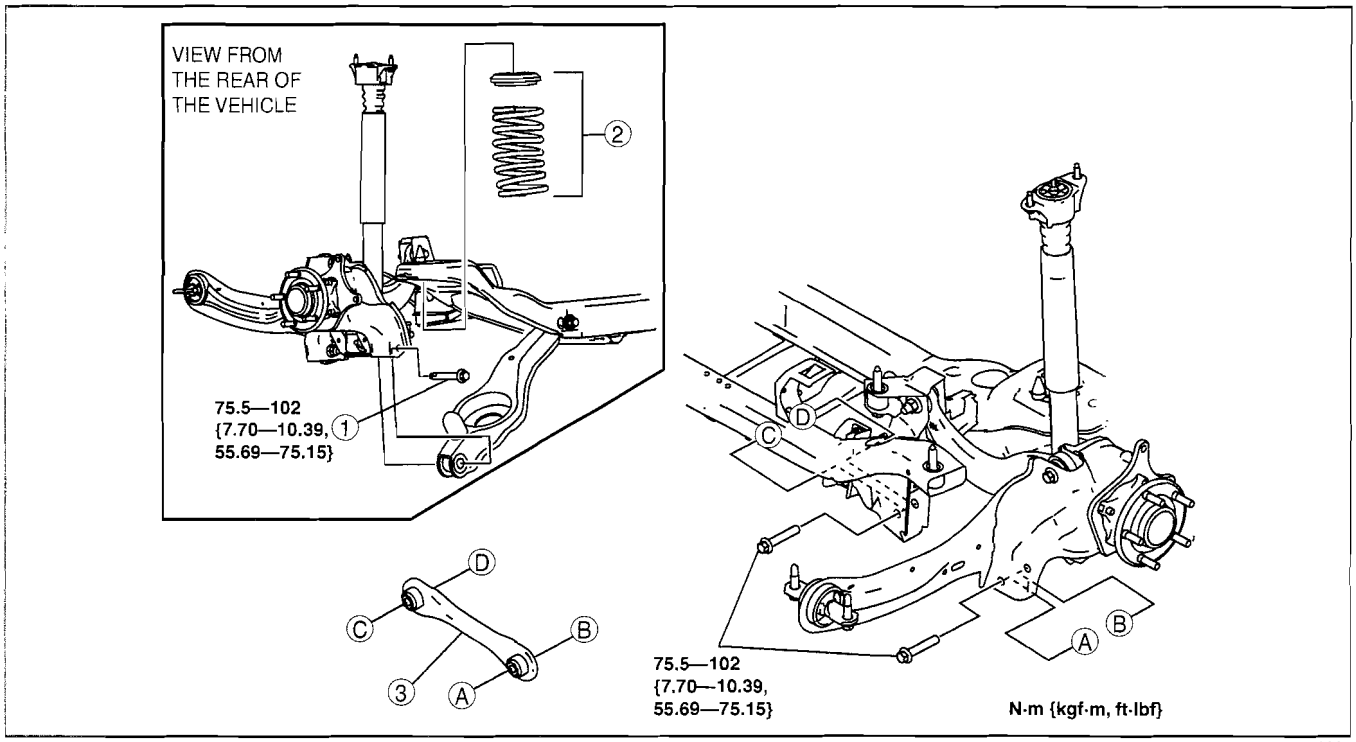
1	Rear coil spring component (See 02-14-4 REAR COIL SPRING REMOVAL/ INSTALLATION.)

2	Rear lower arm inner bolt
3	Rear lower arm
4	Bound stopper

REAR LATERAL LINK REMOVAL/INSTALLATION

id021400801200

1. Remove the rear stabilizer. (See 02-14-10 REAR STABILIZER REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)

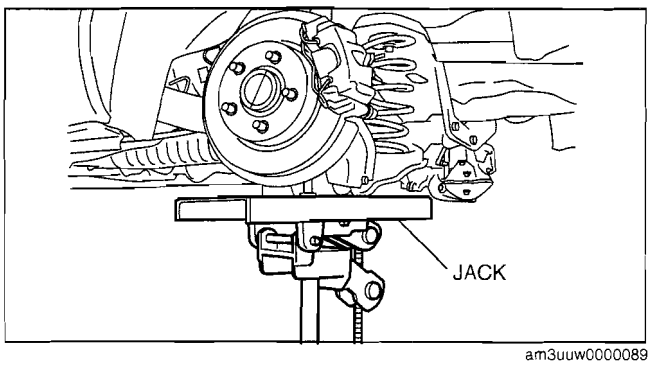


e3u214zw6003

1	Rear lower arm outer bolt (See 02-14-6 Rear Lower Arm Outer Bolt Removal Note.)
2	Rear coil spring component (See 02-14-4 REAR COIL SPRING REMOVAL/ INSTALLATION.)
3	Rear lateral link (See 02-14-6 Rear Lateral Link Installation Note.)

Rear Lower Arm Outer Bolt Removal Note

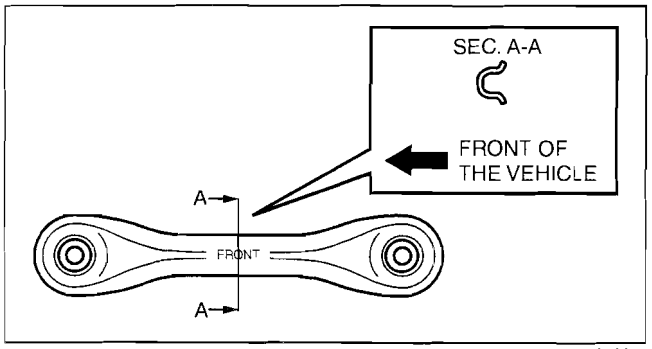
1. Support the rear lower arm using a jack.
2. Loosen the rear lower arm inner bolt.
3. Remove the rear lower arm outer bolt.



am3uuw0000089

Rear Lateral Link Installation Note

1. Install the rear lateral link so that the rib is facing toward the front of the vehicle.

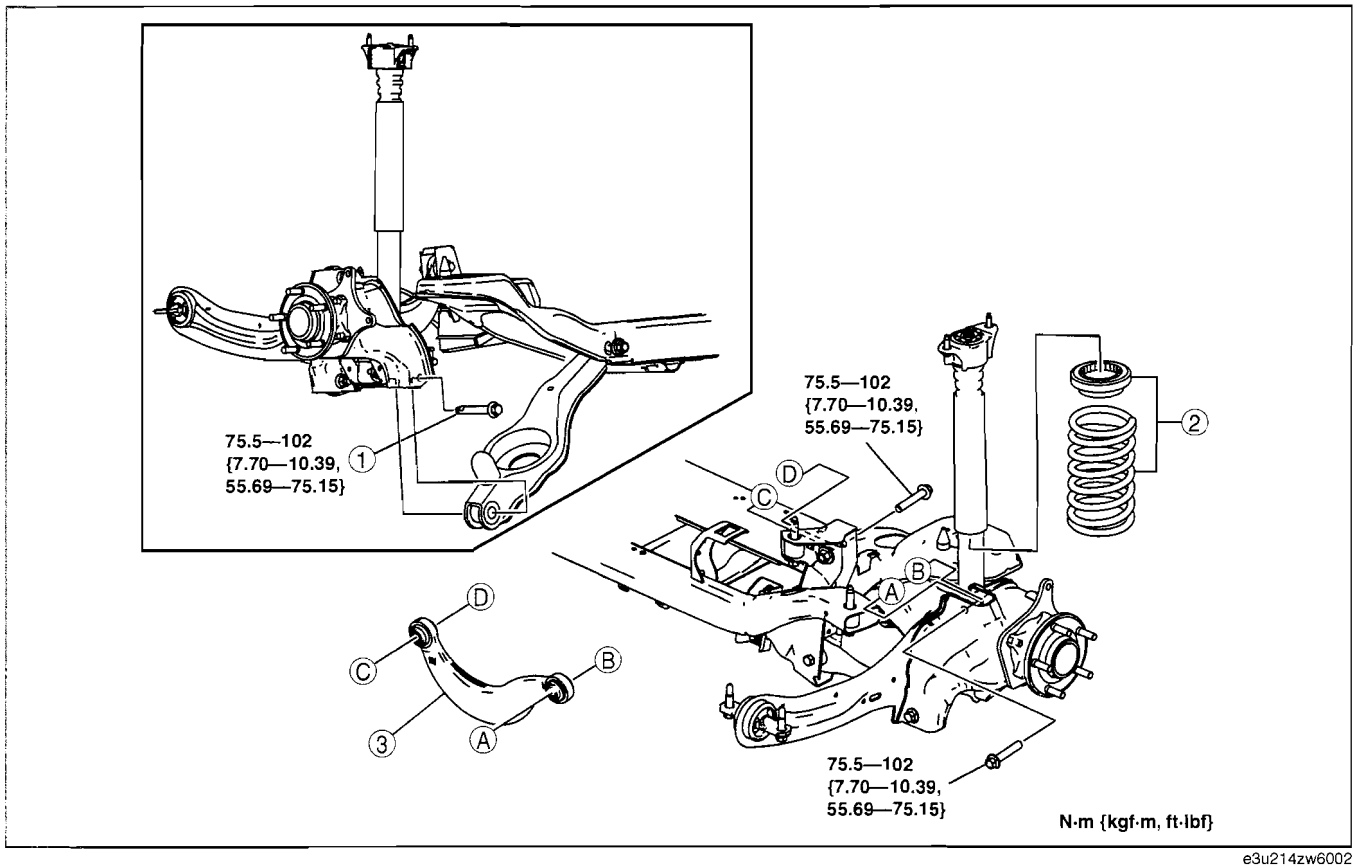


am3uuw0000089

REAR UPPER ARM REMOVAL/INSTALLATION

id021400800800

1. Remove the evaporative mission (EVAP) system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].) (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)



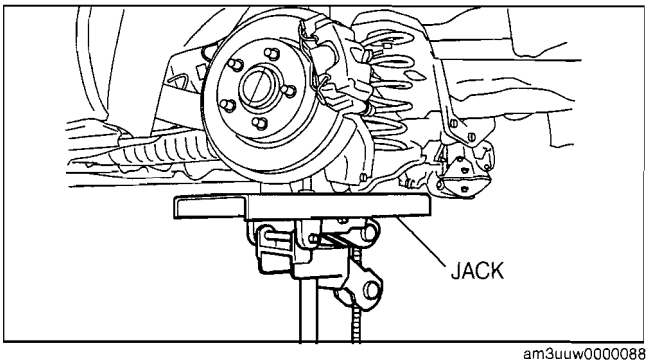
e3u214zw6002

1	Rear lower arm outer bolt (See 02-14-7 Rear Lower Arm Outer Bolt Removal Note.)

2	Rear coil spring component (See 02-14-4 REAR COIL SPRING REMOVAL/INSTALLATION.)
3	Rear upper arm (See 02-14-8 Rear Upper Arm Installation Note.)

Rear Lower Arm Outer Bolt Removal Note

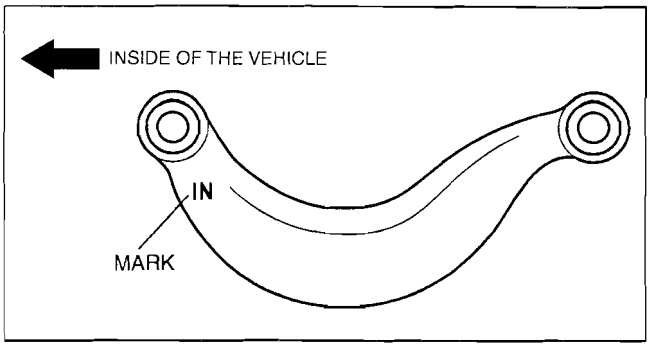
1. Support the rear lower arm using a jack.
2. Loosen the rear lower arm inner bolt.
3. Remove the rear lower arm outer bolt.



am3uuw0000088

Rear Upper Arm Installation Note

1. Install the rear upper arm so that IN mark is facing toward the inside of the vehicle.



am3uuw0000089

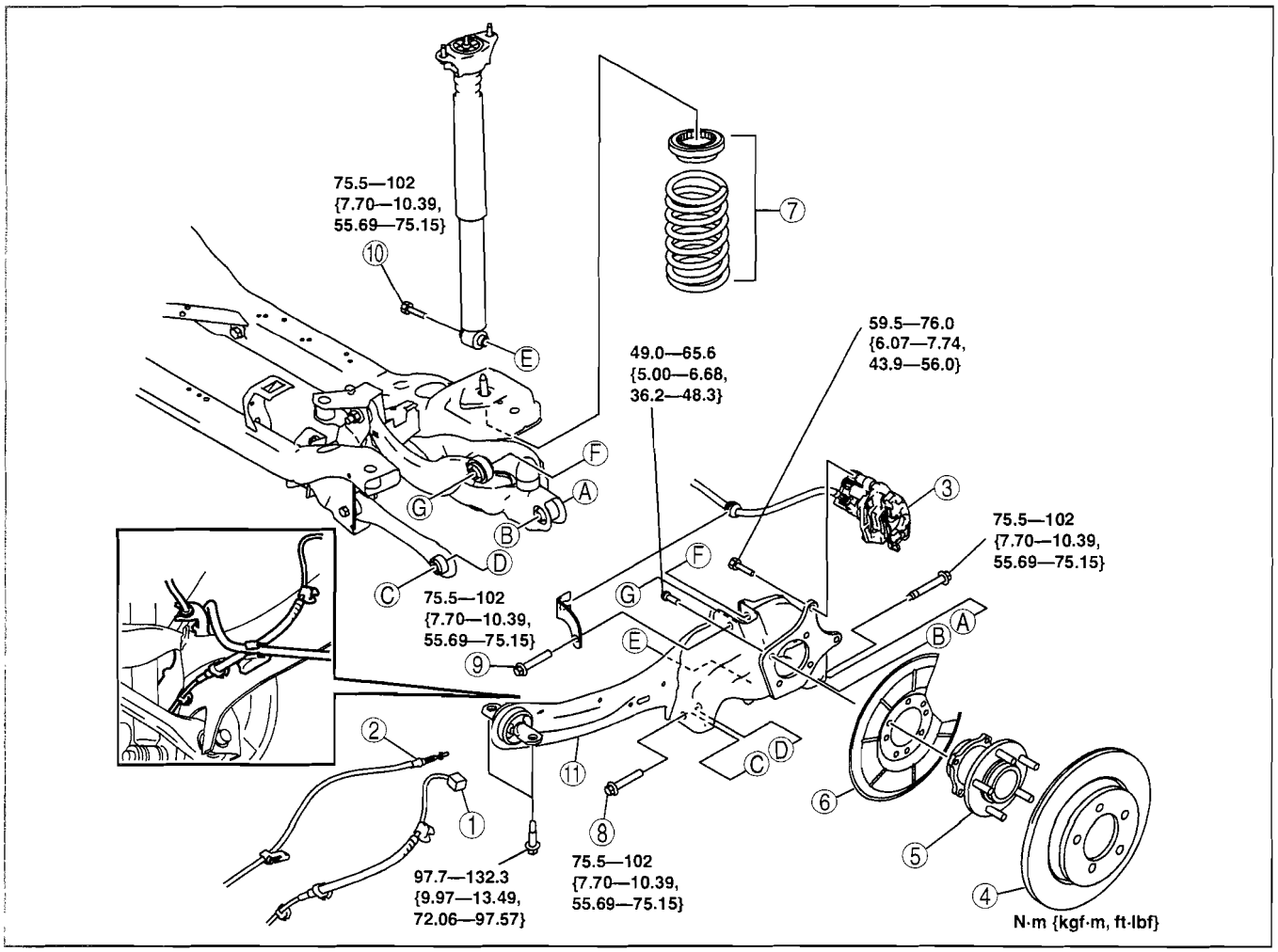
REAR TRAILING LINK REMOVAL/INSTALLATION

id021400802000

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor wiring harness connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)



e3u214zw6007

1	ABS wheel-speed sensor wiring harness connector
2	Rear parking brake cable (See 04-12-2 PARKING BRAKE LEVER REMOVAL/ INSTALLATION.)
3	Brake caliper component (See 02-14-9 Brake Caliper Component Removal Note.)
4	Disc plate
5	Rear hub component
6	Dust cover

7	Rear coil spring component (See 02-14-4 REAR COIL SPRING REMOVAL/ INSTALLATION.)
8	Rear lateral link outer bolt (See 02-14-9 Rear Lateral Link Outer Bolt Removal Note.)
9	Rear upper arm outer bolt
10	Rear shock absorber lower bolt
11	Rear trailing link (See 02-14-9 Rear Trailing Link Installation Note.)

Brake Caliper Component Removal Note

1. Hang the caliper component using a cable and move aside.

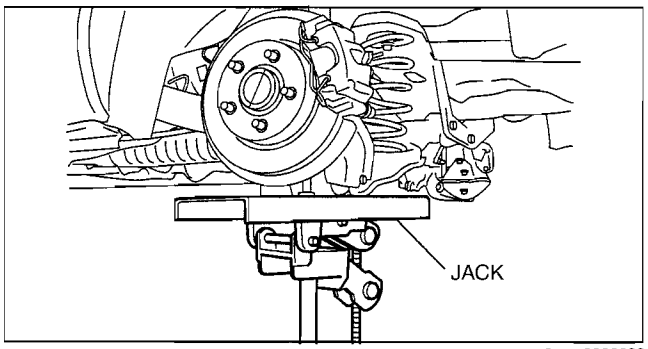
Rear Lateral Link Outer Bolt Removal Note

1. Support the trailing link using a jack.

Caution

- **Verify that the trailing link is securely supported by a jack. If the trailing link falls off, it can cause serious injury or death, and damage to the vehicle.**

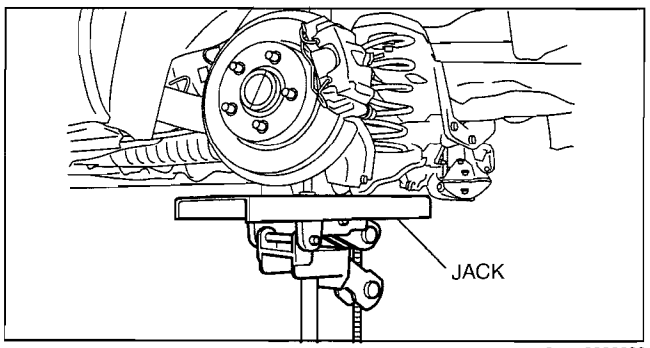
2. Remove the rear lateral link outer bolt.



am3uuw0000089

Rear Trailing Link Installation Note

1. Support the trailing link using a jack.
2. Tighten the trailing link front side bolts.

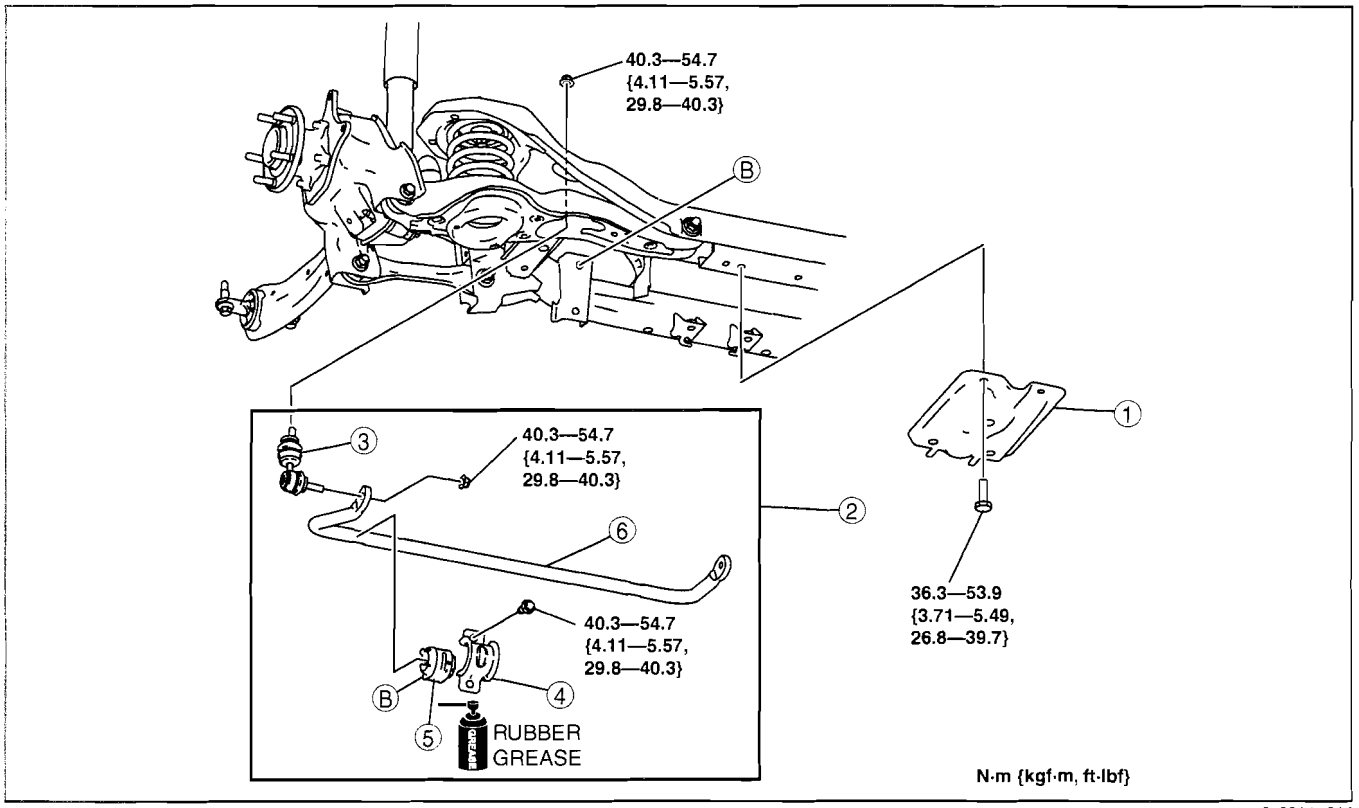


am3uuw0000089

REAR STABILIZER REMOVAL/INSTALLATION

id021400800500

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



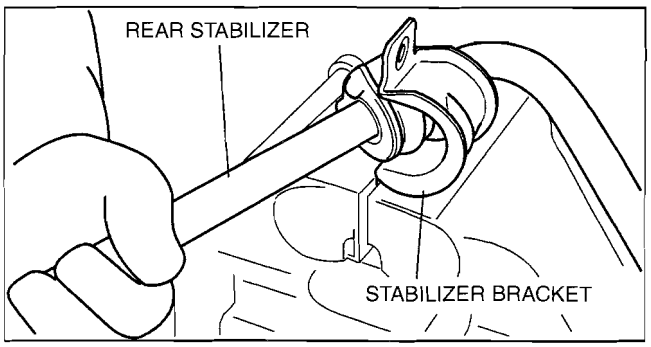
c3u0214w014

1	Rear crossmember bracket
2	Rear stabilizer component (See 02-14-12 Rear Stabilizer Component Installation Note.)
3	Stabilizer control link

4	Stabilizer bracket (See 02-14-10 Stabilizer Bracket Removal Note.) (See 02-14-11 Stabilizer Bracket Installation Note.)
5	Stabilizer bushing (See 02-14-11 Stabilizer Bushing Installation Note.)
6	Rear stabilizer

Stabilizer Bracket Removal Note

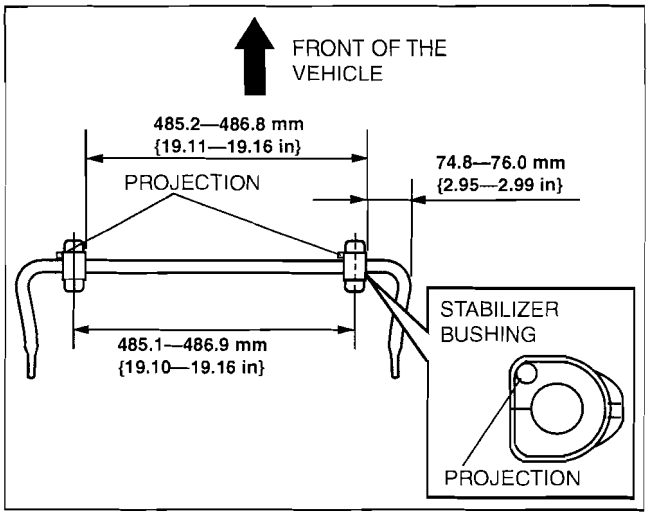
1. Secure the stabilizer bracket flange using a vise.
2. Remove the stabilizer bracket.



am3uuw0000088

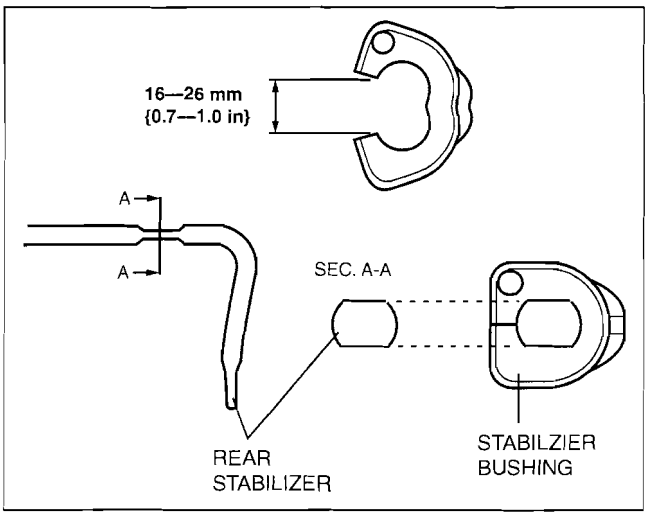
Stabilizer Bushing Installation Note

1. Place the stabilizer bushing so that the projection is facing toward the left side of the vehicle.



c3u0214w016

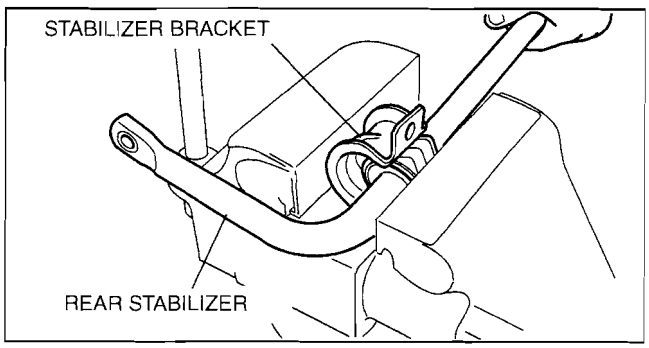
2. Widen the stabilizer bushing opening **16—26 mm {0.7—1.0 in}** and install the bushing to the rear stabilizer as shown in the figure.



am3uuw0000088

Stabilizer Bracket Installation Note

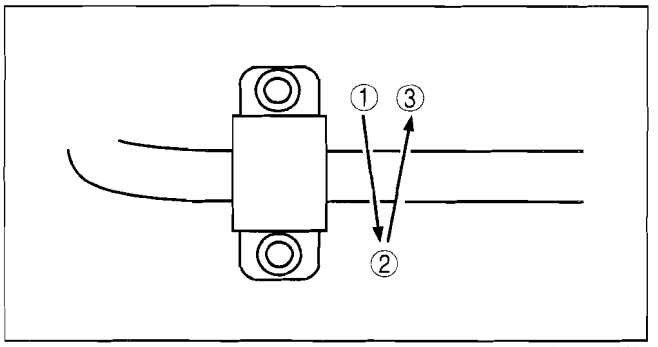
1. Apply grease to the stabilizer bushing.
2. Install the stabilizer bracket using a vise.



am3uuw0000088

Rear Stabilizer Component Installation Note

1. Tighten the bolts in order indicated in the figure.



am3uuw0000088

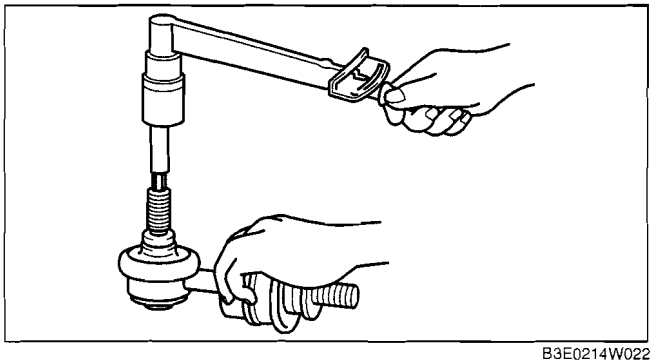
STABILIZER CONTROL LINK INSPECTION

id021400800300

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending or damage. If there is any malfunction, replace the stabilizer control link.
3. Rotate the ball joint stud **10 times** and shake it side to side **10 times**.
4. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.

   Stabilizer control link ball joint rotational torque
   0.5—2.0 N·m {6—20 kgf·cm, 5—17 in·lbf}

   - If not within the specification, replace the stabilizer control link.



B3E0214W022

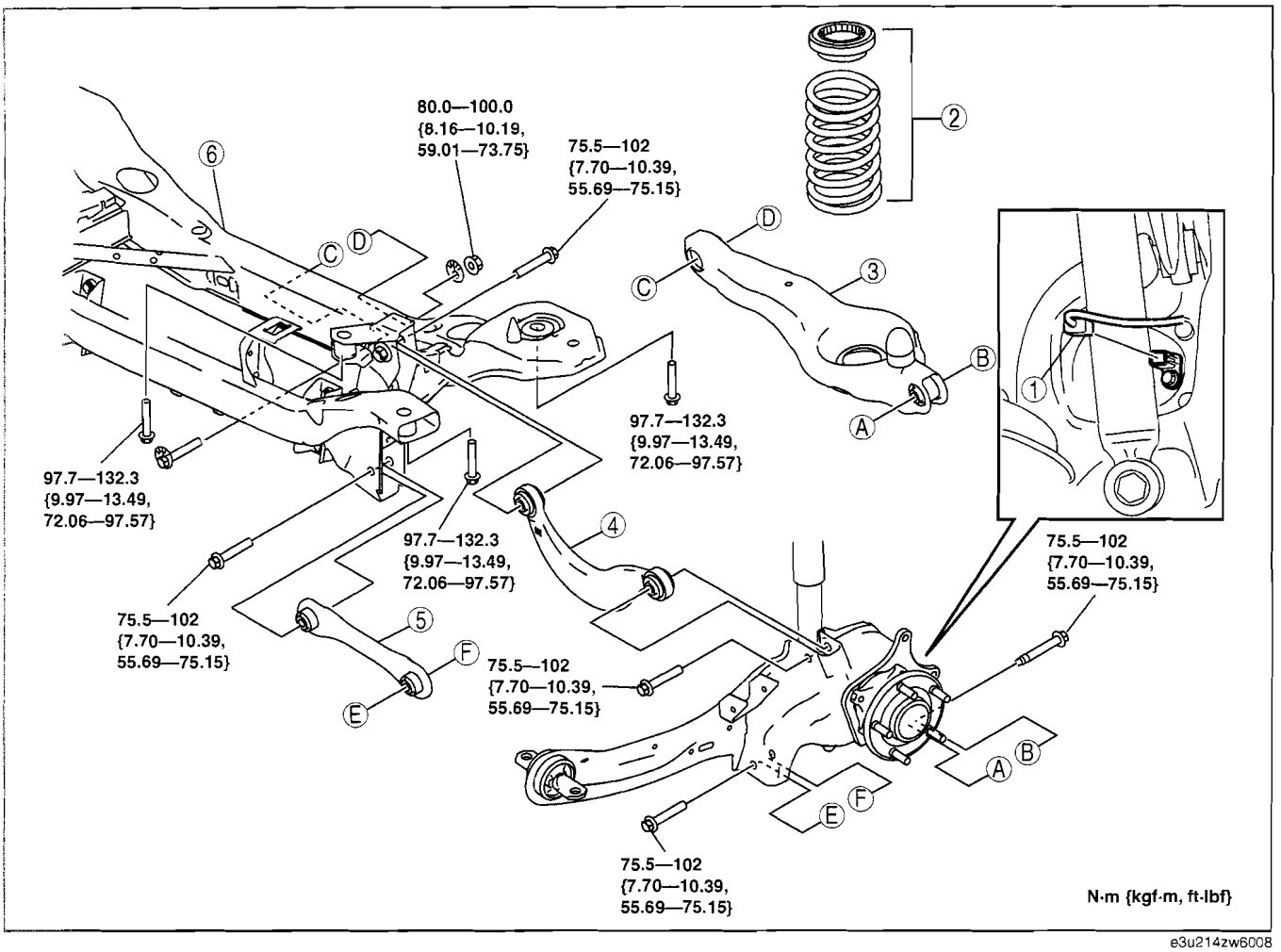
REAR CROSSMEMBER REMOVAL/INSTALLATION

id021400801000

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor wiring harness connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove the rear stabilizer. (See 02-14-10 REAR STABILIZER REMOVAL/INSTALLATION.)
2. Remove the charcoal canister. (See 01-16A-7 CHARCOAL CANISTER REMOVAL/INSTALLATION[LF, L3].) (See 01-16B-6 CHARCOAL CANISTER REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the evaporative emission (EVAP) system leak detection pump. (See 01-16A-9 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[LF, L3].) (See 01-16B-7 EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Inspect the wheel alignment and adjust it if necessary. (See 02-11-4 REAR WHEEL ALIGNMENT.)



e3u214zw6008

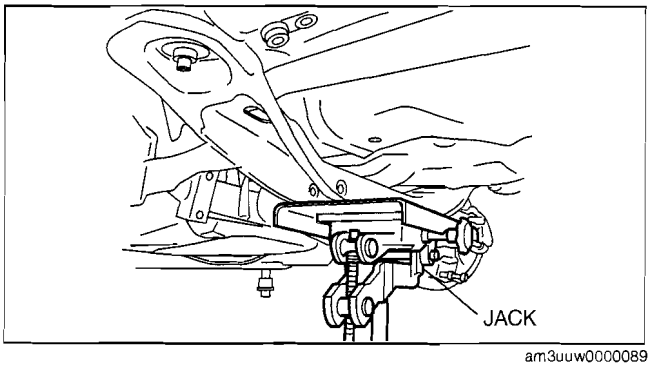
1	ABS wheel-speed sensor wiring harness connector
2	Rear coil spring (See 02-14-4 REAR COIL SPRING REMOVAL/ INSTALLATION.)
3	Rear lower arm (See 02-14-5 REAR LOWER ARM REMOVAL/ INSTALLATION.)
4	Rear upper arm (See 02-14-7 REAR UPPER ARM REMOVAL/ INSTALLATION.)
5	Rear lateral link (See 02-14-6 REAR LATERAL LINK REMOVAL/ INSTALLATION.)
6	Rear crossmember (See 02-14-13 Rear Crossmember Removal Note.)

Rear Crossmember Removal Note

Warning

- **Verify that the crossmember is securely supported by a jack. If the rear crossmember falls off, it can cause serious injury or death, and damage to the vehicle.**

1. Support the rear crossmember with the jack and remove the bolt.
2. Remove the rear crossmember.



am3uuw0000089

02-50 TECHNICAL DATA

SUSPENSION TECHNICAL DATA

id025000800100

Front wheel alignment [LF and L3] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Maximum steering angle [Tolerance ±3°]		Inner	39°48′				
		Outer	32°48′				
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Caster angle*2 [Tolerance ±1°]			2°54′	2°56′	2°58′	3°00′	3°02′
Camber angle*2 [Tolerance ±1°]			−0°39′	−0°40′		−0°41′	
Steering axis inclination (Reference value)			13°52′	13°53′		13°55′	

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Front wheel alignment [L3 WITH TC] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Maximum steering angle [Tolerance ±3°]		Inner	36°00′				
		Outer	30°12′				
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Caster angle*2 [Tolerance ±1°]			3°01′	3°02′	3°04′	3°06′	3°08′
Camber angle*2 [Tolerance ±1°]			−0°55′	−0°56′			−0°57′
Steering axis inclination (Reference value)			14°18′	14°20′			14°21′

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 . Difference between left and right must not exceed **1°30′**.

Rear wheel alignment [LF and L3] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Camber angle*2 (Reference value) [Tolerance ±1°]			−1°20′	−1°21′	−1°23′	−1°25′	−1°27′
Thrust angle (Reference value) [Tolerance ±0°48′]			0°				

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Rear wheel alignment [L3 WITH TC] (Unloaded)*1

Item			Fuel gauge indication				
			Empty	1/4	1/2	3/4	Full
Total toe-in	Tire [Tolerance ±4 {±0.16}]	(mm {in})	2 {0.08}				
	Rim inner		1±3 {0.04±0.12}				
		(degree)	0°11′±0°22′				
Camber angle*2 (Reference value) [Tolerance ±1°]			−1°36′	−1°37′	−1°39′	−1°40′	−1°42′
Thrust angle (Reference value) [Tolerance ±0°48′]			0°				

*1 : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
*2 : Difference between left and right must not exceed **1°30′**.

Wheel and tires

Item			Specification			
Standard tire and wheel						
Wheel	Size		15 ×6J	16 × 6 1/2J	17 × 6 1/2J	18 × 7J
	Offset	(mm {in})	52.5 {2.07}			
	Pitch circle diameter	(mm {in})	114.3 {4.50}			
	Material		Steel	Aluminum alloy		
Tire	Size		P195/65R15 89H	P205/55R16 89H	P205/50R17 88V	215/45R18 93Y
	Air pressure (kPa {psi})	Front	230 {34}	220 {32}	220 {32}	230 {34}
		Rear				220 {32}
	Remaining tread	(mm {in})	1.6 {0.06}			
Wheel and tire	Tightening torque	(N·m {kgf·m, ft·lbf})	88.2—117.6 {9.00—11.99, 65.06—86.73}			
	Wheel and tire runout (mm {in})	Radial direction	1.5 {0.06} max.			
		Lateral direction	2.5 {0.10} max.	2.0 {0.08} max.		
	Wheel imbalance	(g {oz})	Knock-type*2: 9 {0.32} max.	Adhesive-type*1: 14 {0.49} max. Knock-type*2: 9 {0.31} max.	Adhesive-type*1: 13 {0.46} max. Knock-type*2: 8 {0.28} max.	Adhesive-type*1: 11 {0.38} max. Knock-type*2: 7 {0.25} max.	Adhesive-type*1: 10 {0.35} max. Knock-type*2: 6 {0.21} max.
Temporary spare tire						
Wheel	Size		15× 4T	16× 4T		17× 4T
	Offset	(mm {in})	45 {1.8}			40 {1.6}
	Pitch circle diameter	(mm {in})	114.3 {4.50}			
	Material		Steel			
Tire	Size		T115/70 D15	T125/70 D16		T125/70 D16
	Air pressure	(kPa {psi})	420 {60}			
Wheel and tire	Wheel and tire runout (mm {in})	Radial direction	2.0 {0.08} max.			
		Lateral direction	2.5 {0.10} max.			
	Tightening torque	(N·m {kgf·m, ft·lbf})	88.2—117.6 {9.00—11.99, 65.06—86.73}			

*1 : Total weight exceeds **160 g {5.65 oz}**.
*2 : One balance weight: **60 g {2.12 oz}** max. If the total weight exceeds **100 g {3.53 oz}** on one side, rebalance after moving the tire around on the rim. Do not use three or more balance weights.

DRIVELINE/AXLE

03
SECTION

03-10 GENERAL PROCEDURES

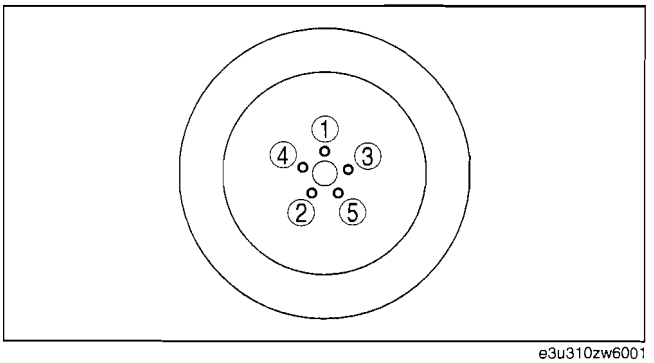
GENERAL PROCEDURES (FRONT AND REAR AXLES)

id031000800100

Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.

   Tightening torque
   88.2—117.6 N·m {9.00—11.99 kgf·m, 65.06—86.73 ft·lbf}



e3u310zw6001

Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

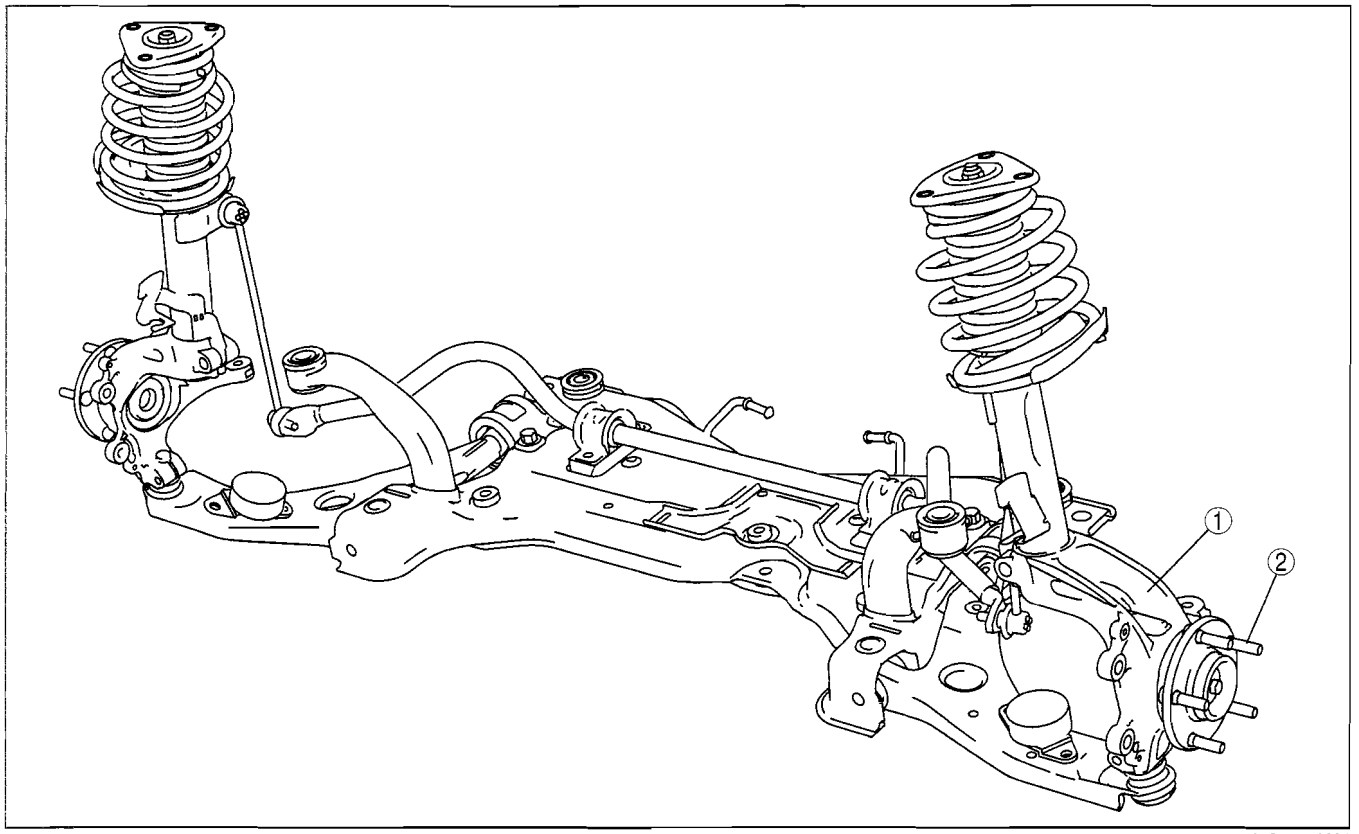
Suspension Links Removal/Installation

1. For the joint sections with rubber bushings, raise the vehicle using a lift, and then temporarily tighten the installation bolts and nuts. Lower the vehicle to the ground and tighten them completely with the specified torque.

03-11 FRONT AXLE

FRONT AXLE LOCATION INDEX

id031100800100



e3u311zw6001

1	Wheel hub, steering knuckle (See 03-11-2 WHEEL HUB, STEERING KNUCKLE INSPECTION.) (See 03-11-3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.)

2	Wheel hub bolt (See 03-11-2 FRONT WHEEL HUB BOLT REPLACEMENT.)

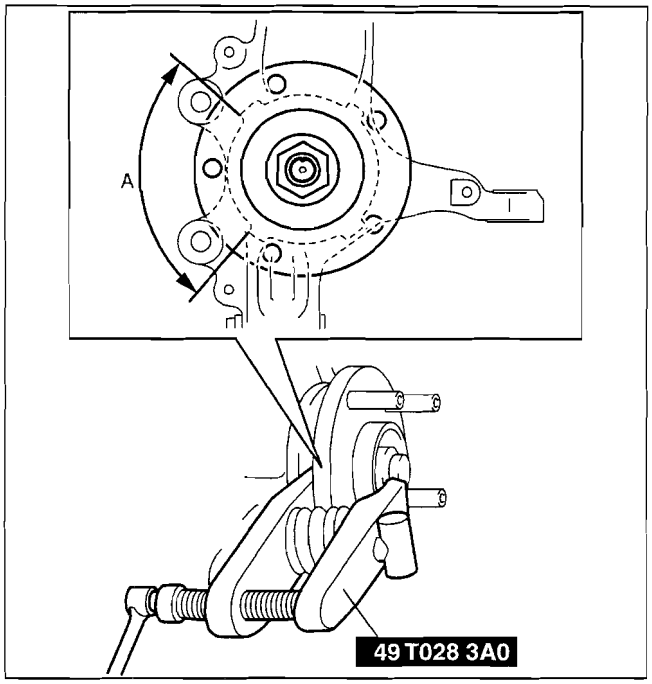
FRONT WHEEL HUB BOLT REPLACEMENT

id031100800200

1. Remove the brake calliper component and disc plate.
2. Remove the wheel hub bolt using the **SST** as shown in the figure.

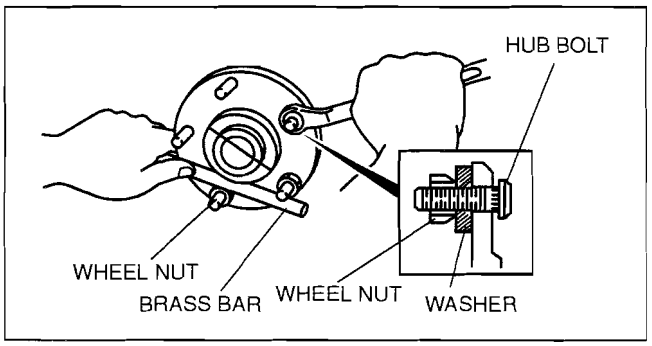
Note
- When removing the wheel hub bolts, perform the work between range A shown in the figure to assure a space for the bolt removal.

3. Place a new wheel hub bolt in the wheel hub.



am5uuw0000086

4. Install the wheel hub by placing a proper sized washer on the hub, and tightening the nut as shown in the figure.



am3uuw0000099

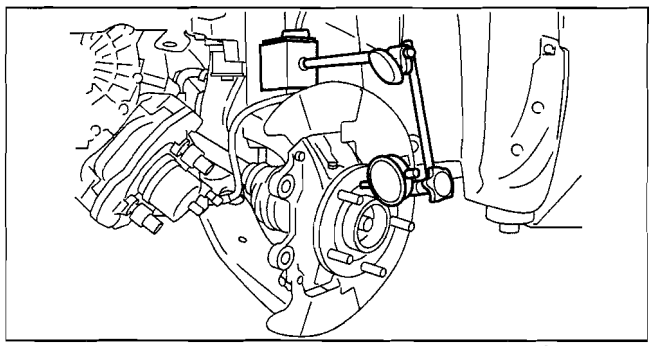
WHEEL HUB, STEERING KNUCKLE INSPECTION

id031100800300

Wheel Bearing Excessive Play Inspection

1. Install the magnetic base and dial gauge as shown in the figure and measure the wheel bearing axial excessive play.
   - If it exceeds the maximum specification, replace the wheel hub bearing.

Maximum front wheel bearing play
0.05 mm {0.002 in}



B3E0311W002

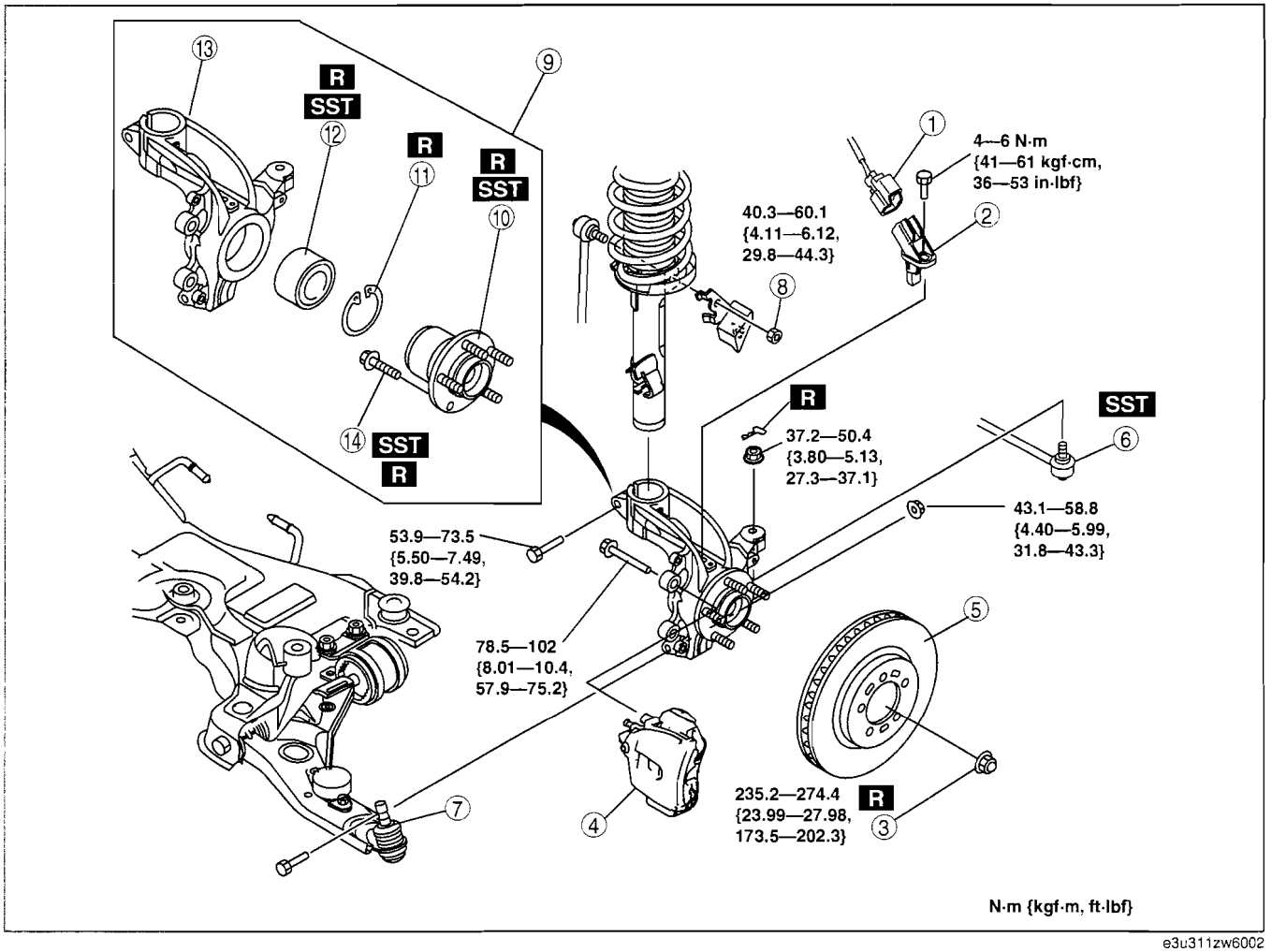
WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION

id031100800400

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, inspect the front wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



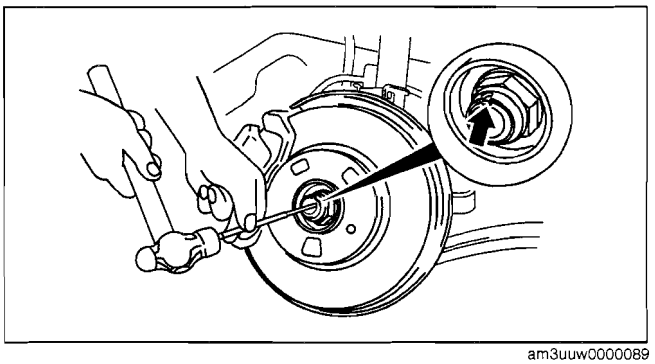
e3u311zw6002

1	ABS wheel-speed sensor connector
2	ABS wheel-speed sensor
3	Locknut (See 03-11-4 Locknut Removal Note.) (See 03-11-7 Locknut Installation Note.)
4	Brake caliper component (See 03-11-4 Brake Caliper Removal Note.)
5	Disc plate (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[LF, L3].) (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[L3 WITH TC].)
6	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
7	Front lower arm ball joint

8	Stabilizer control link upper nut
9	Wheel hub, steering knuckle component (See 03-11-4 Wheel Hub, Steering Knuckle Component Removal Note.)
10	Wheel hub component (See 03-11-4 Wheel Hub Component Removal Note.) (See 03-11-6 Wheel Hub Component Installation Note.)
11	Retaining clip
12	Wheel bearing (See 03-11-5 Wheel Bearing Removal Note.) (See 03-11-6 Wheel Bearing Installation Note.)
13	Steering knuckle
14	Hub bolt (See 03-11-5 Wheel Hub Bolt Removal Note.) (See 03-11-6 Wheel Hub Bolt Installation Note.)

Locknut Removal Note

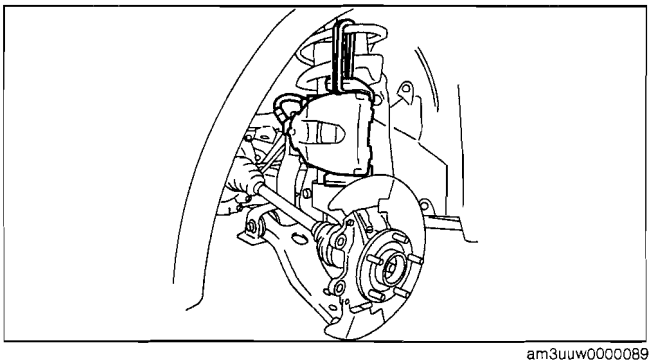
1. Knock the crimped portion of the locknut outward using a small chisel and a hummer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.



am3uuw0000089

Brake Caliper Removal Note

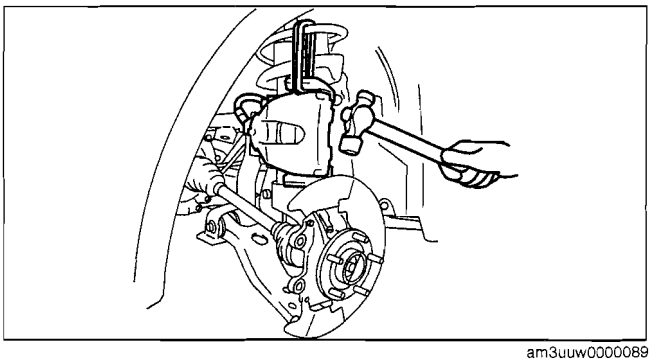
1. Remove the brake caliper component from the steering knuckle and suspend it out of the way using a cable.



am3uuw0000089

Wheel Hub, Steering Knuckle Component Removal Note

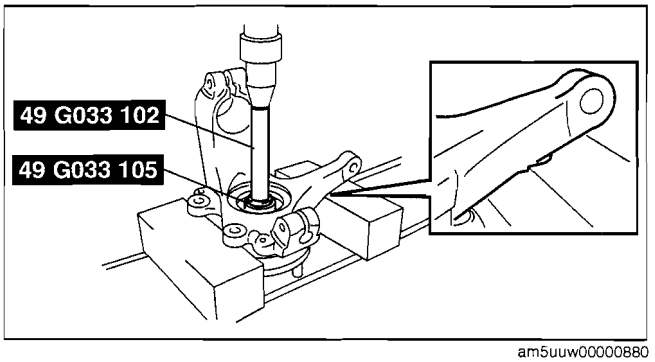
1. Separate the shock absorber from the wheel hub, steering knuckle component by tapping the upper part of the steering knuckle with a hammer.



am3uuw0000089

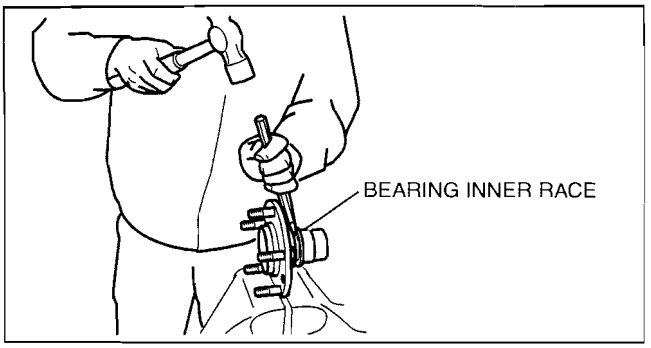
Wheel Hub Component Removal Note

1. Remove the wheel hub component using the **SSTs**.



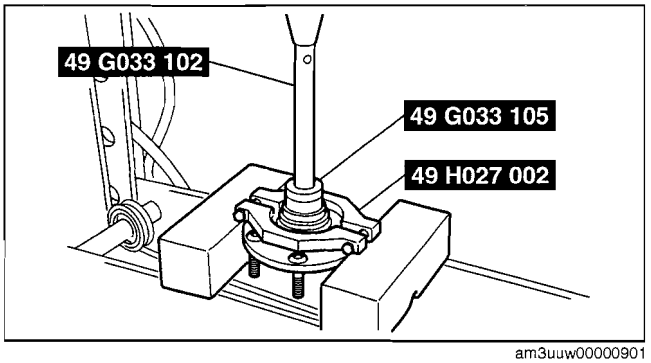
am5uuw00000880

2. If the bearing inner race remains on the wheel hub component, use a chisel to secure a sufficient space for installing the **SST** (49 H027 002) between wheel hub component and bearing inner race.



am5uuw0000018

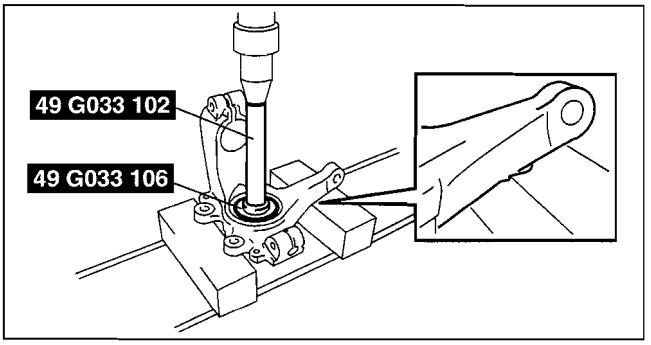
3. Remove the bearing inner race using the **SSTs**.



am3uuw00000901

Wheel Bearing Removal Note

1. Remove the wheel bearing using the **SSTs**.



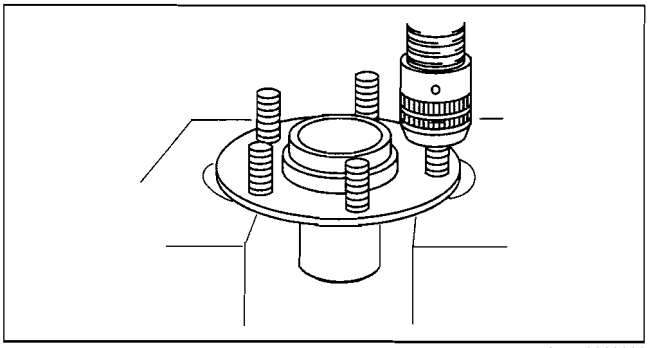
am5uuw00000881

Wheel Hub Bolt Removal Note

Note

- The hub bolts do not need to be removed unless they are being replaced.

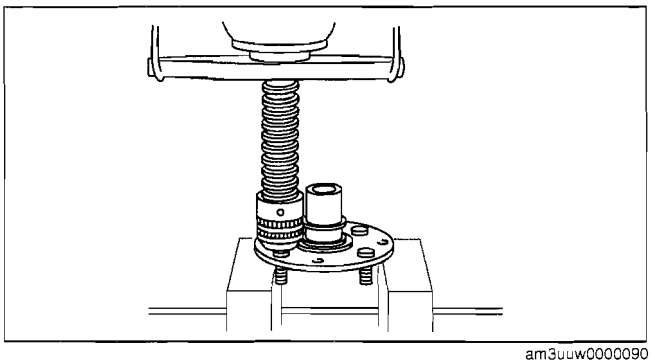
1. Remove the hub bolt using a press.



am3uuw0000090

Wheel Hub Bolt Installation Note

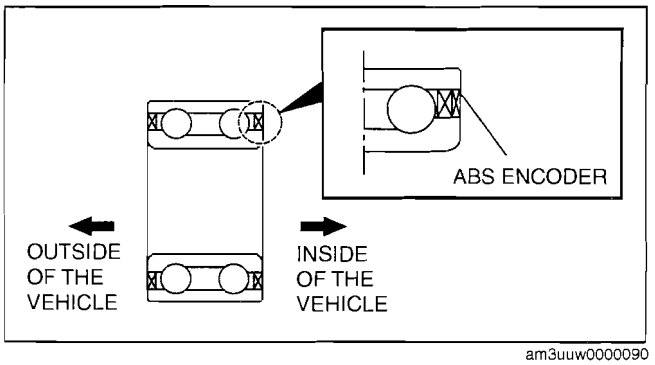
1. Install the new hub bolt using a press.



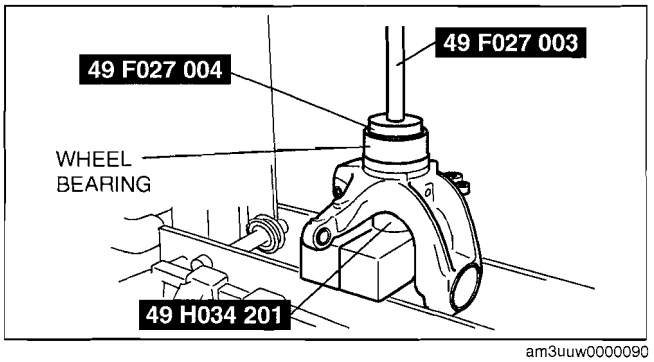
Wheel Bearing Installation Note

Caution

- **Install the wheel bearing with the ABS encoder facing inside of the vehicle.**

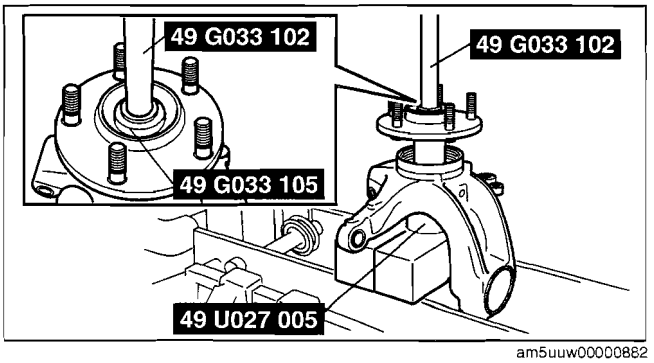


1. Install the new wheel bearing using the **SSTs**.



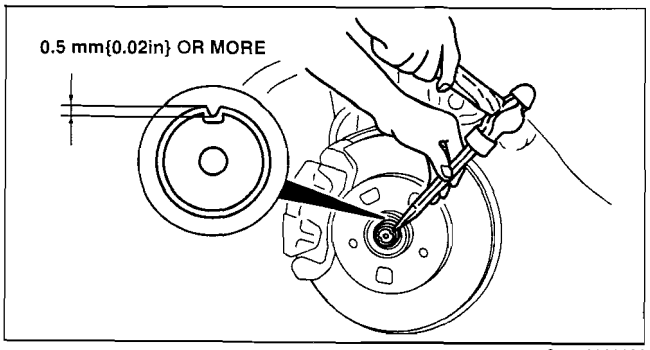
Wheel Hub Component Installation Note

1. Install the wheel hub component using the **SSTs**.



Locknut Installation Note

1. Install a new locknut and stake it as shown.

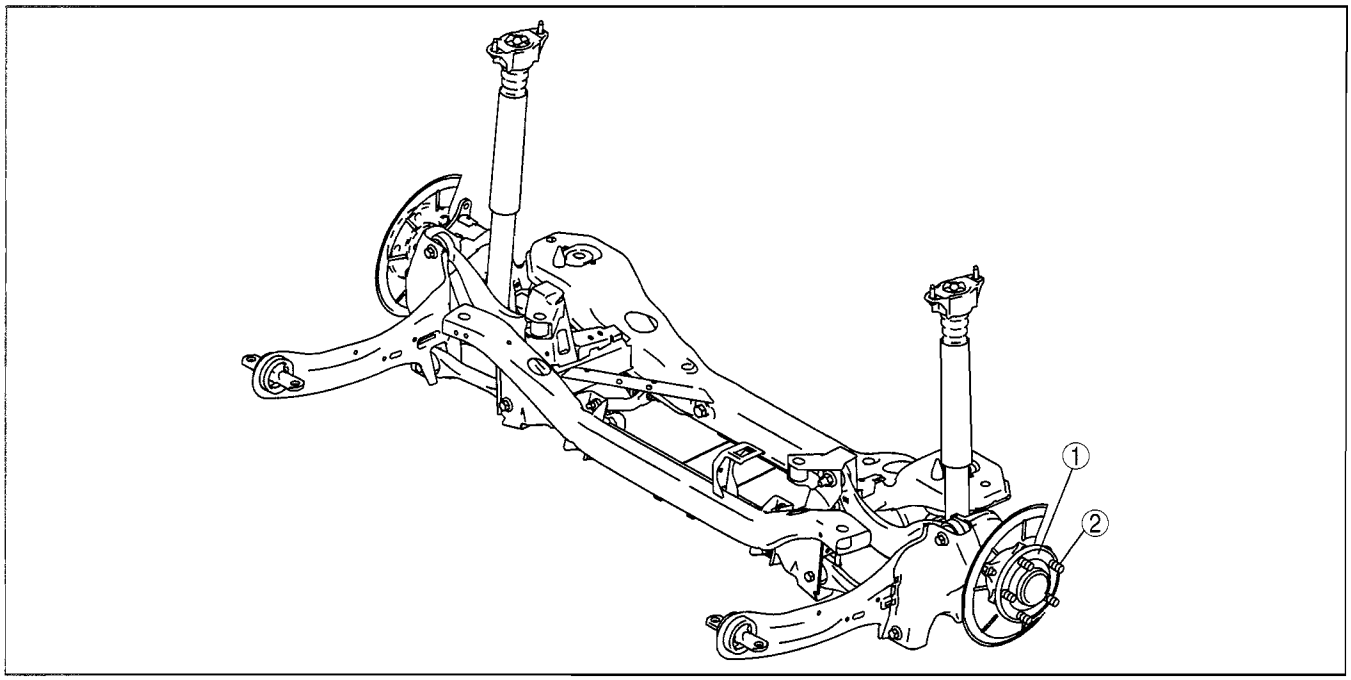


am3uuw0000090

03-12 REAR AXLE

REAR AXLE LOCATION INDEX

id031200800100



e3u312zw6001

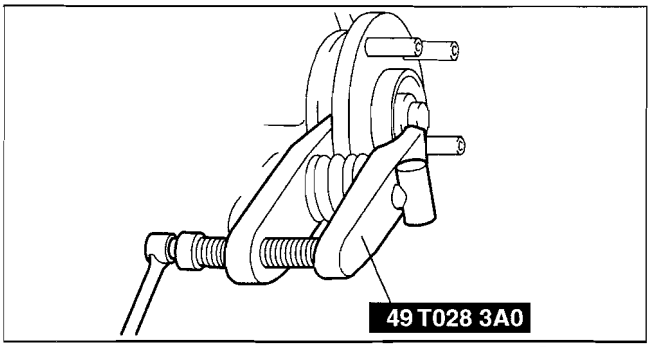
1	Wheel hub component (See 03-12-2 WHEEL HUB COMPONENT INSPECTION.) (See 03-12-3 WHEEL HUB COMPONENT REMOVAL/INSTALLATION.)

2	Wheel hub bolt (See 03-12-2 WHEEL HUB BOLT REPLACEMENT.)

WHEEL HUB BOLT REPLACEMENT

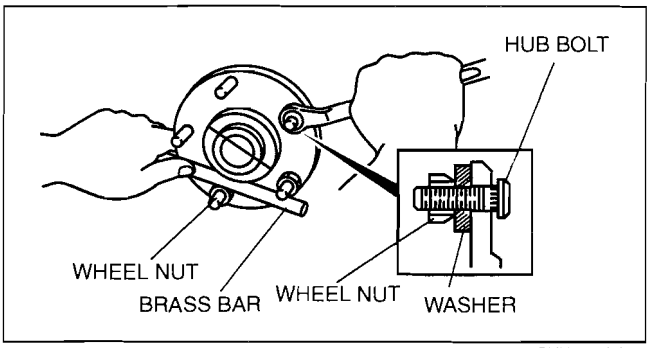
id031200800800

1. Remove the brake calliper component and disc plate.
2. Remove the wheel hub bolt using the **SST** as shown in the figure.
3. Place a new wheel hub bolt in the wheel hub.



D3U312ZSI001

4. Install the wheel hub by placing a proper sized washer on the hub, and tightening the nut as shown in the figure.



CHU0311W005

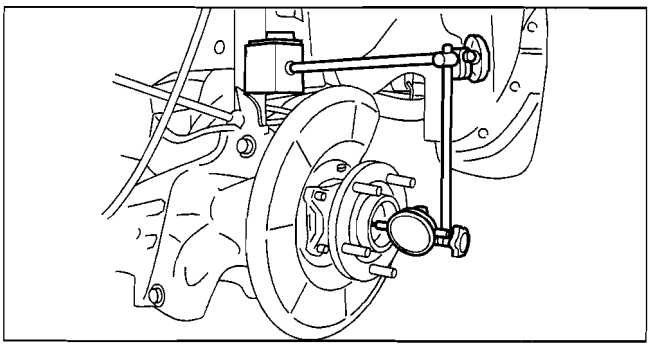
WHEEL HUB COMPONENT INSPECTION

id031200800300

Wheel Bearing Excessive Play Inspection

1. Install the magnetic base and dial gauge as shown in the figure and measure the wheel bearing axial excessive play.
   - If it exceeds the maximum specification, replace the wheel hub component.

Maximum rear wheel bearing play
0.05 mm {0.002 in}



B3E0312W002

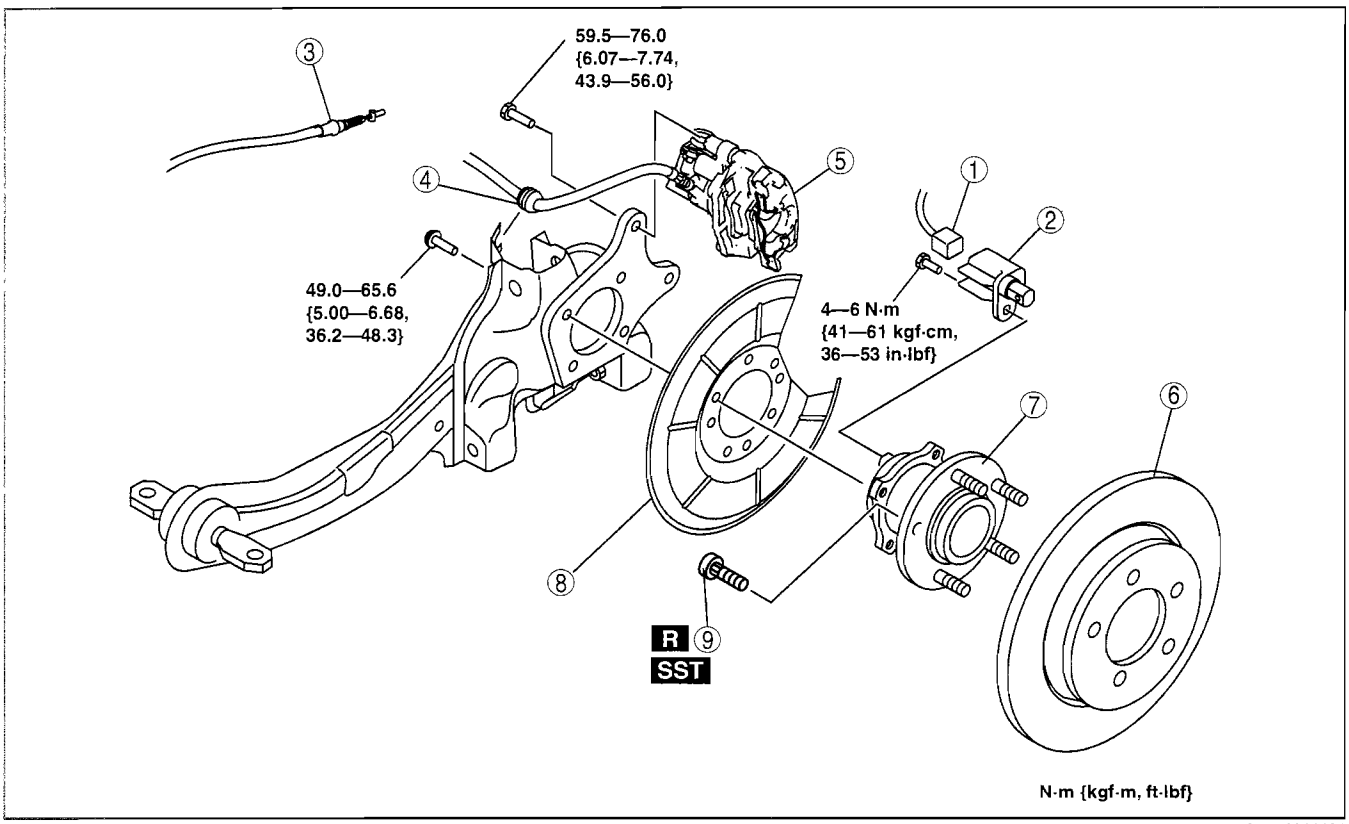
WHEEL HUB COMPONENT REMOVAL/INSTALLATION

id031200800400

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor connector (wheel hub side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



am3uuw0000091

1	ABS wheel-speed sensor connector
2	ABS wheel-speed sensor
3	Rear parking brake cable (See 04-12-2 PARKING BRAKE LEVER REMOVAL/INSTALLATION.)
4	Brake hose
5	Brake caliper component (See 03-12-4 Brake Caliper Component Removal Note.)

6	Disc plate (See 04-11-30 REAR BRAKE (DISC) REMOVAL/INSTALLATION.)
7	Wheel hub component
8	Dust cover
9	Wheel hub bolt (See 03-12-4 Wheel Hub Bolt Removal Note.) (See 03-12-4 Wheel Hub Bolt Installation Note.)

Brake Caliper Component Removal Note

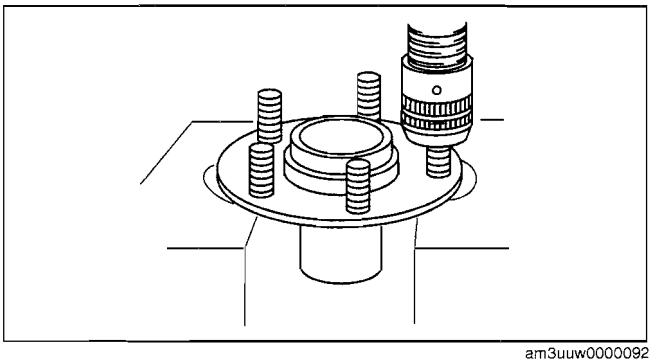
1. Remove the brake caliper component from the trailing link and suspend it out of the way using a cable.

Wheel Hub Bolt Removal Note

Note

- The hub bolts do not need to be removed unless they are being replaced.

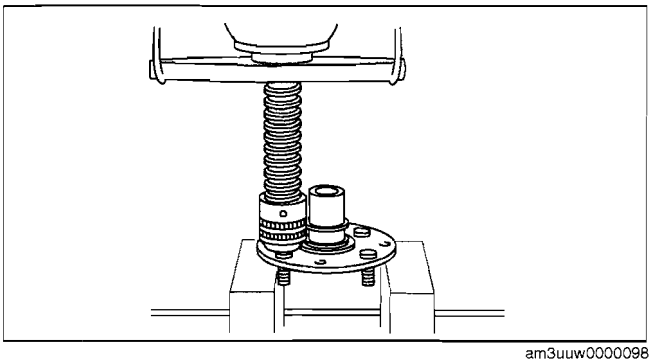
1. Remove the hub bolt using a press.



am3uuw0000092

Wheel Hub Bolt Installation Note

1. Install the new hub bolt using a press.

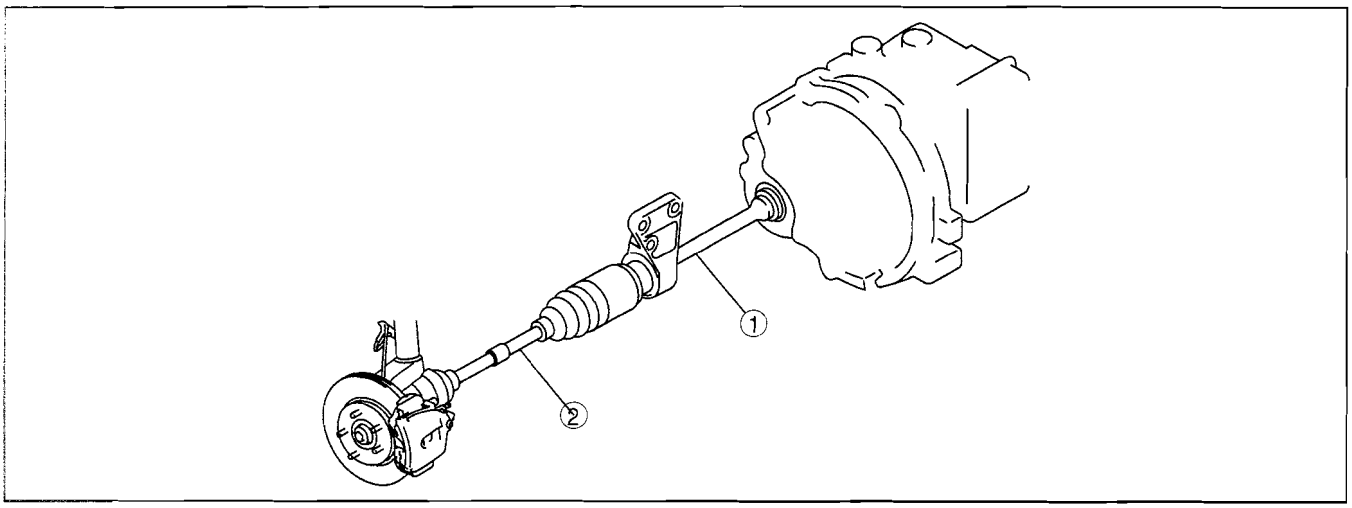


am3uuw0000098

03-13 DRIVE SHAFT

DRIVE SHAFT LOCATION INDEX

id031300800100



c3u0313w105

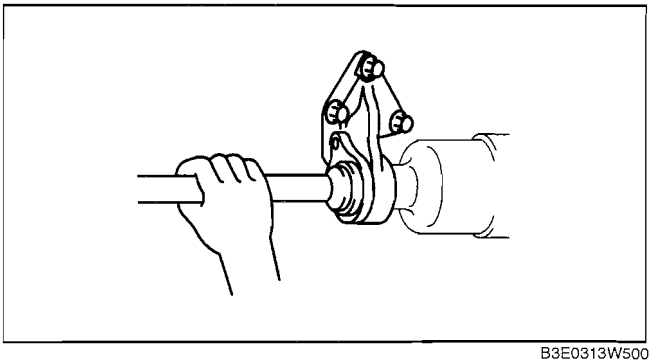
1	Joint shaft (See 03-13-2 JOINT SHAFT INSPECTION.) (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].) (See 03-13-6 JOINT SHAFT DISASSEMBLY/ASSEMBLY.)

2	Drive shaft (See 03-13-8 DRIVE SHAFT INSPECTION.) (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-12 DRIVE SHAFT (TRIPOD JOINT) DISASSEMBLY/ASSEMBLY.)

JOINT SHAFT INSPECTION

id031300801500

1. Verify that there is no torsion or cracks on the joint shaft.
   - If there is any malfunction, replace the joint shaft.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly.
   - If there is any malfunction, replace the joint shaft.



B3E0313W500

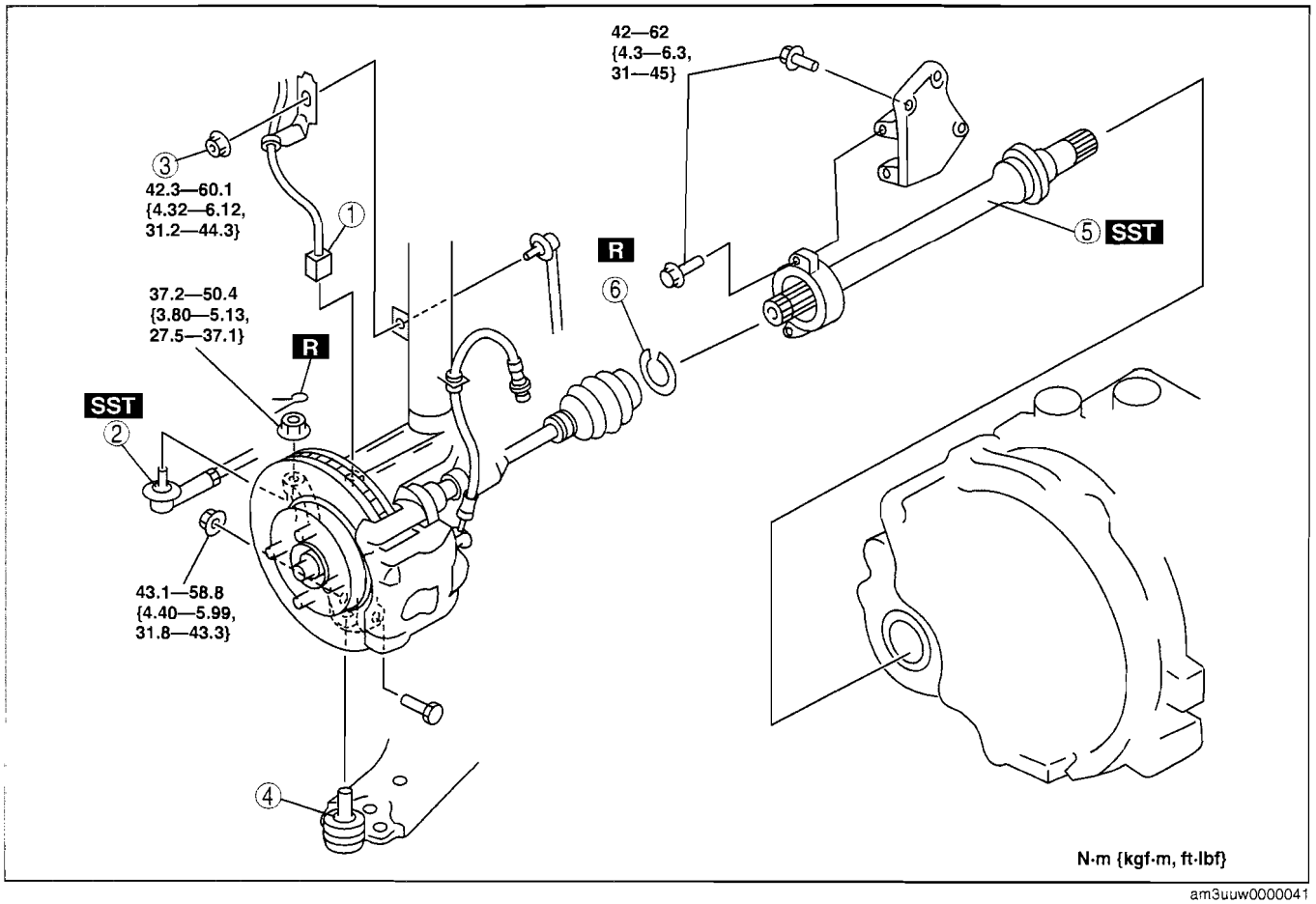
JOINT SHAFT REMOVAL/INSTALLATION[LF]

id031300800917

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor wiring harness will not be pulled by mistake while servicing the vehicle.**

1. Drain the transaxle oil. (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R].) (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



am3uuw0000041

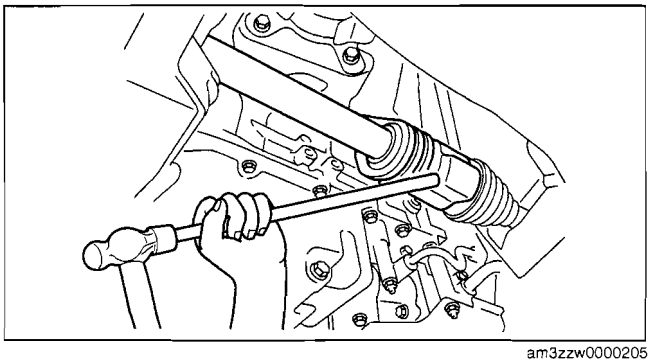
1	ABS wheel-speed sensor connector
2	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
3	Stabilizer control link upper nut
4	Front lower arm ball joint
5	Joint shaft (See 03-13-3 Joint Shaft Removal Note.)
6	Clip (See 03-13-3 Clip Installation Note.)

Joint Shaft Removal Note

1. Disconnect the drive shaft (RH) from the joint shaft by tapping the transaxle side outer ring with a brass bar and hammer.
2. Disconnect the joint shaft bracket from the cylinder block and remove the joint shaft.

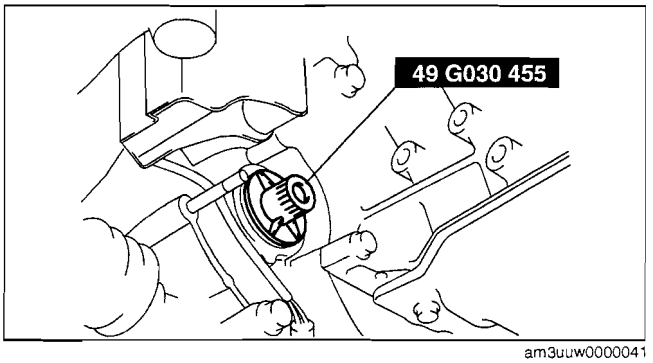
Caution

- **The sharp edges of the joint shaft can slice or puncture the oil seal. Be careful when removing the joint shaft from the transaxle.**



am3zzw0000205

3. Install the **SST** to the transaxle after the joint shaft is removed.

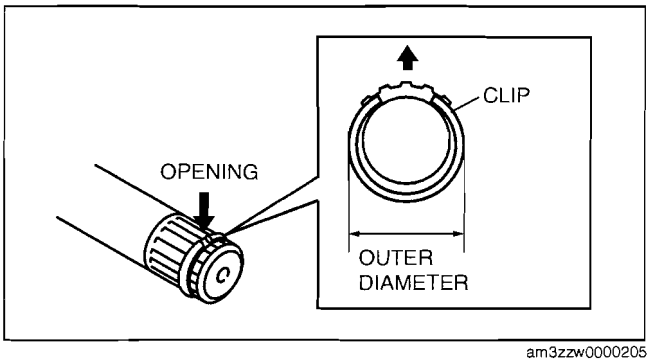


am3uuw0000041

Clip Installation Note

1. Install a new joint shaft clip to the clip groove at the end of the joint shaft with the clip opening facing upward and the clip width within the specification.
2. After installation, measure the outer diameter.
   - If it exceeds the specification, repeat installation using a new clip.

Standard
31.2 mm {1.23 in} or less



am3zzw0000205

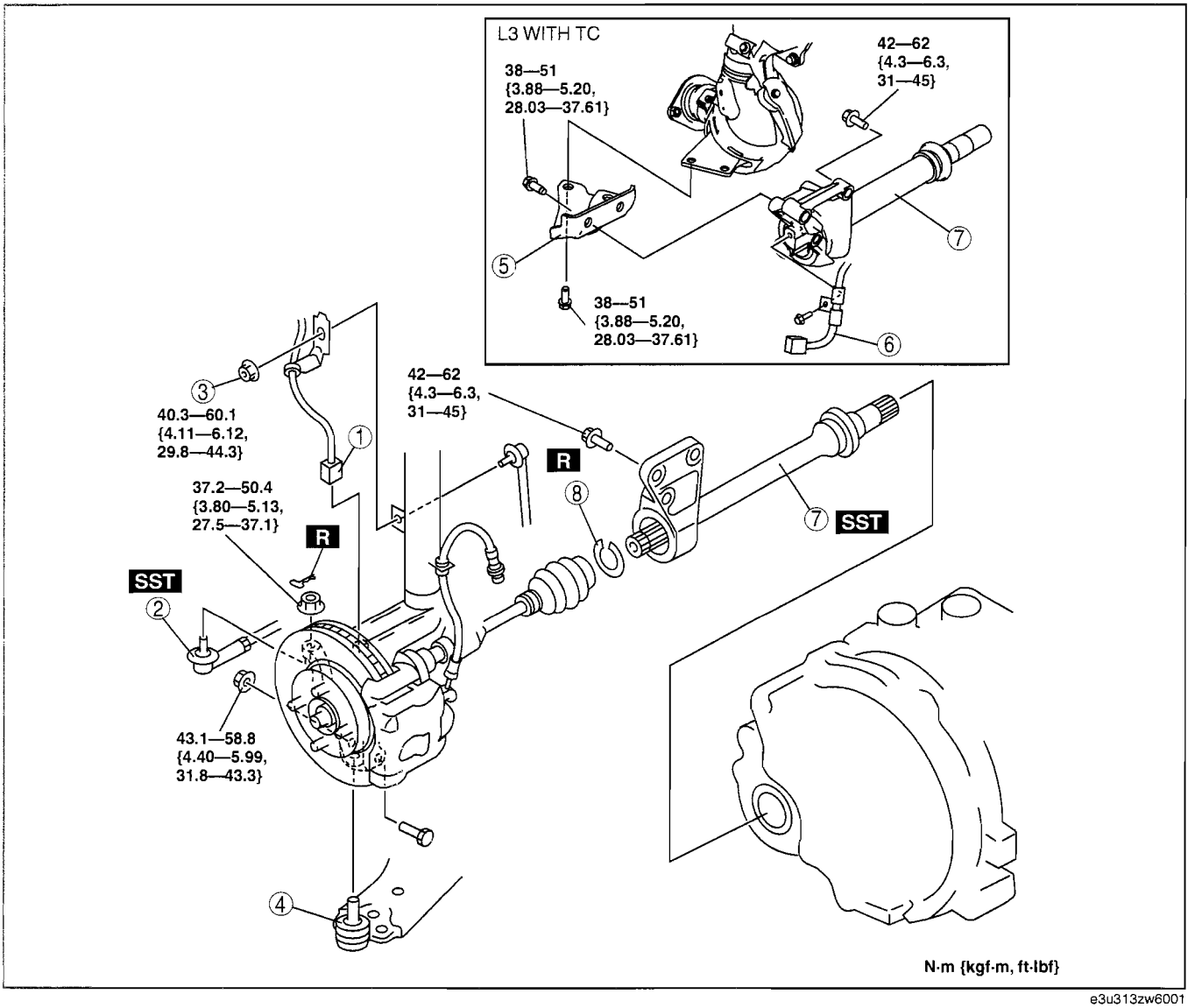
JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC]

id031300800918

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor wiring harness will not be pulled by mistake while servicing the vehicle.**

1. Drain the transaxle oil. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].) (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R].) (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



e3u313zw6001

1	ABS wheel-speed sensor connector
2	Tie-rod end ball joint (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.)
3	Stabilizer control link upper nut
4	Front lower arm ball joint

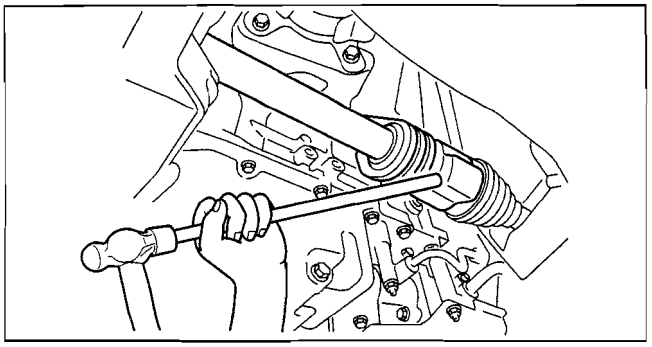
5	WU-TWC bracket
6	CKP sensor connecor and harness bracket
7	Joint shaft (See 03-13-5 Joint Shaft Removal Note.)
8	Clip (See 03-13-5 Clip Installation Note.)

Joint Shaft Removal Note

1. Disconnect the drive shaft (RH) from the joint shaft by tapping the transaxle side outer ring with a brass bar and hammer.
2. Disconnect the joint shaft bracket from the cylinder block and remove the joint shaft.

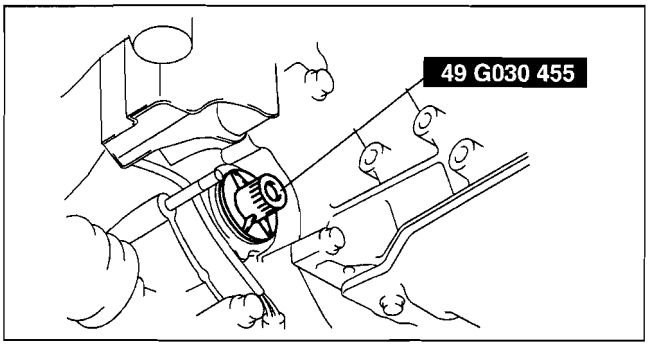
Caution

- **The sharp edges of the joint shaft can slice or puncture the oil seal. Be careful when removing the joint shaft from the transaxle.**



am3uuw0000041

3. Install the **SST** to the transaxle after the joint shaft is removed.



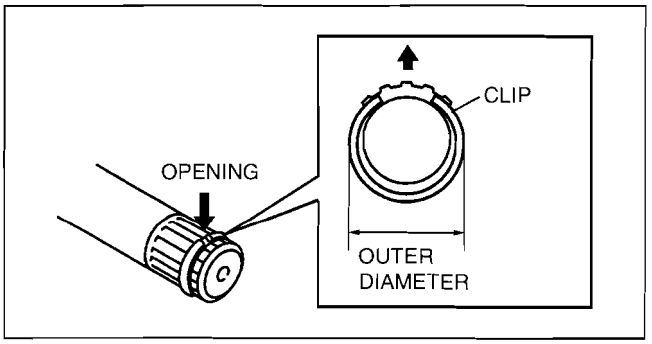
am3uuw0000099

Clip Installation Note

1. Install a new joint shaft clip to the clip groove at the end of the joint shaft with the clip opening facing upward and the clip width within the specification.
2. After installation, measure the outer diameter.
   - If it exceeds the specification, repeat installation using a new clip.

Standard

L3: 31.0 mm {1.22 in} or less
L3 WITH TC: 31.2 mm {1.23 in} or less

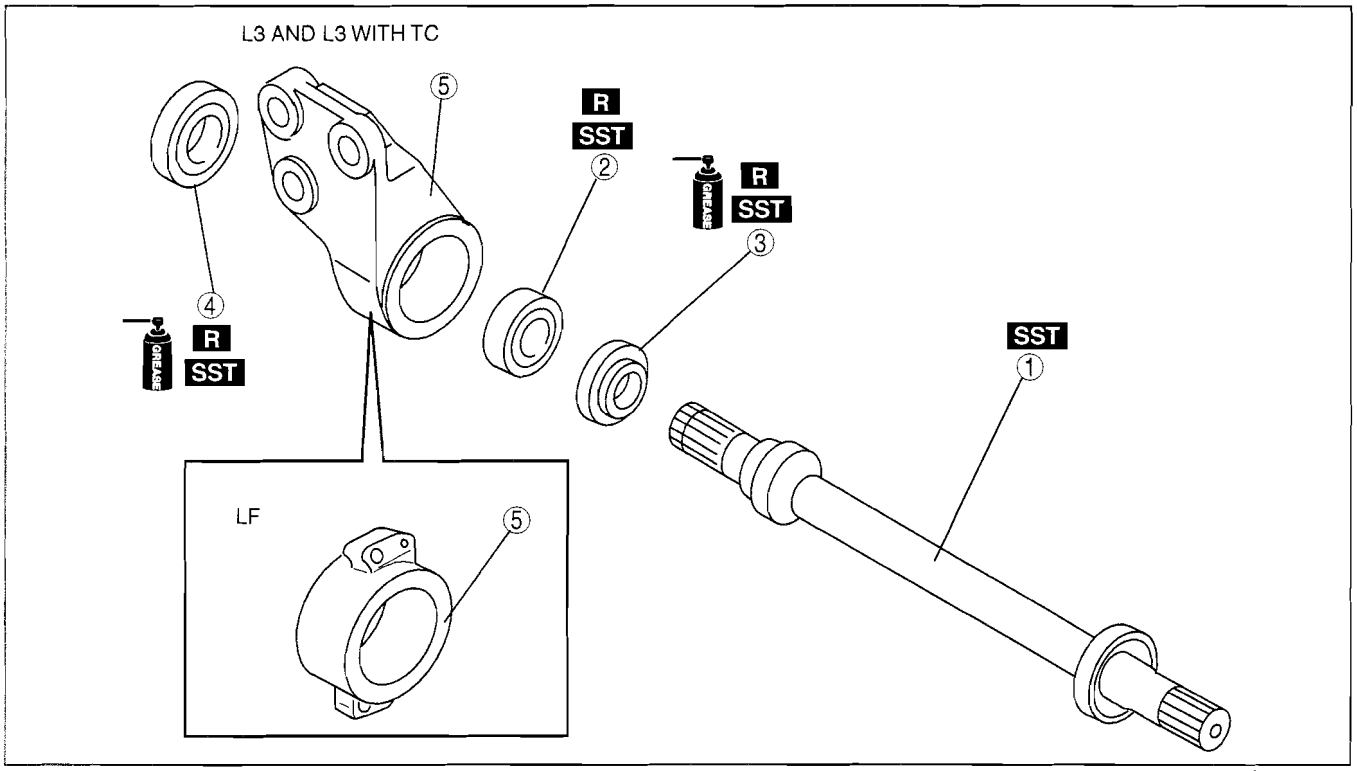


am3uuw0000041

JOINT SHAFT DISASSEMBLY/ASSEMBLY

id031300801400

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

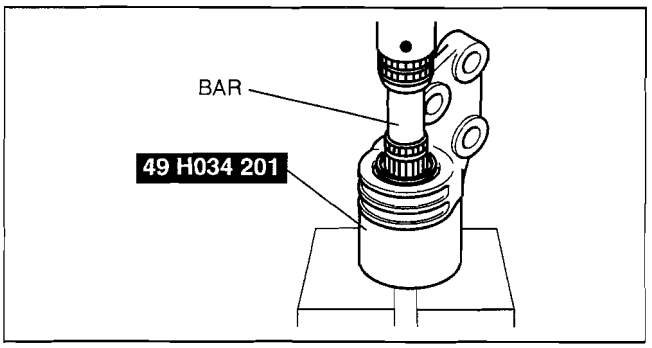


am3uuw0000041

1	Joint shaft (See 03-13-6 Joint Shaft Disassembly Note.) (See 03-13-8 Joint Shaft Assembly Note.)
2	Bearing (See 03-13-7 Bearing Disassembly Note.) (See 03-13-7 Bearing Assembly Note.)
3	Dust seal (LH) (See 03-13-8 Dust Seal (LH) Assembly Note.)
4	Dust seal (RH) (See 03-13-7 Dust Seal (RH) Assembly Note.)
5	Bracket

Joint Shaft Disassembly Note

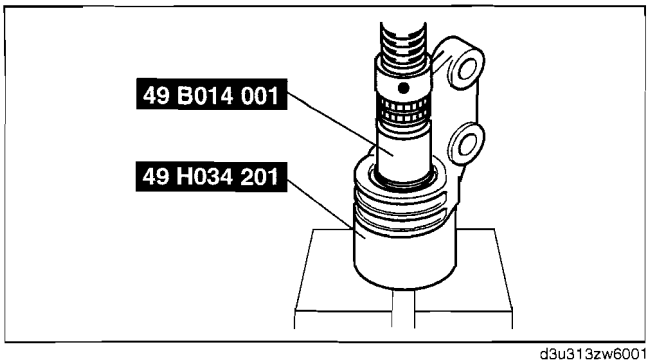
1. Remove the joint shaft using the **SST** and a press.



c3u0313w010

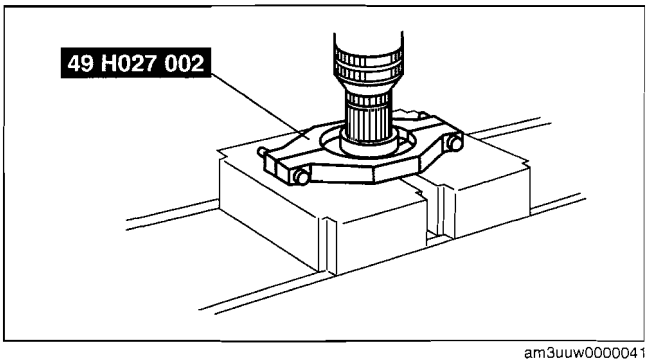
Bearing Disassembly Note

1. Remove the bearing and the dust seal (RH/LH) using the **SSTs**.



d3u313zw6001

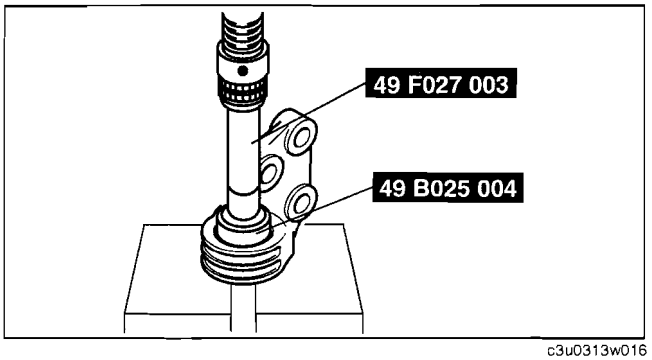
2. If the bearing remains on the joint shaft, set the **SST** and joint shaft to the press.



am3uuw0000041

Dust Seal (RH) Assembly Note

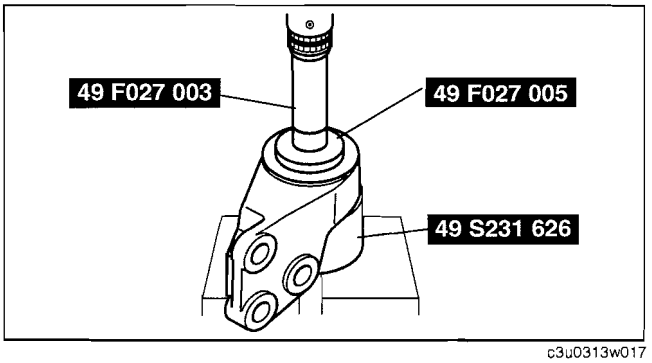
1. Apply grease to a new dust seal lip.
2. Install the dust seal (RH) using the **SSTs**.



c3u0313w016

Bearing Assembly Note

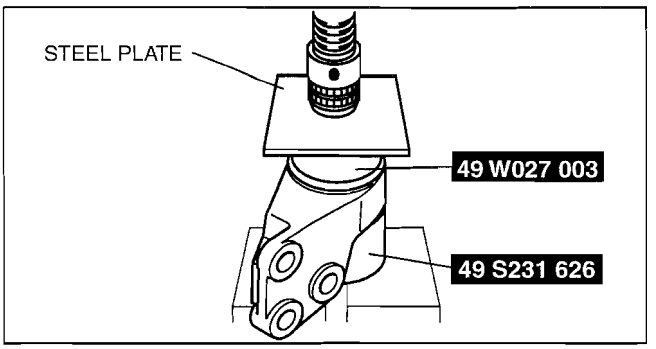
1. Install a new bearing using the **SSTs**.



c3u0313w017

Dust Seal (LH) Assembly Note

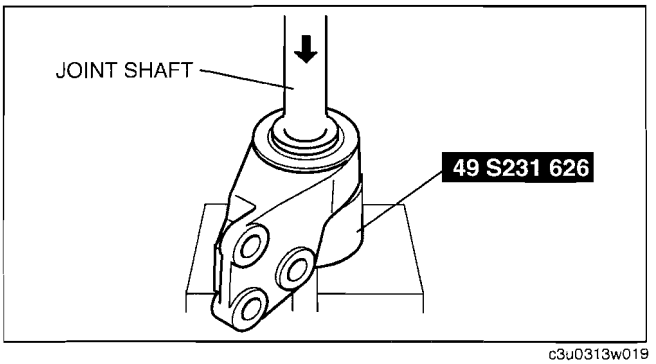
1. Apply grease to a new dust seal lip.
2. Install a new dust seal (LH) using the steel plate and the **SSTs**.



c3u0313w018

Joint Shaft Assembly Note

1. Press fit the joint shaft using the **SST** and a press.

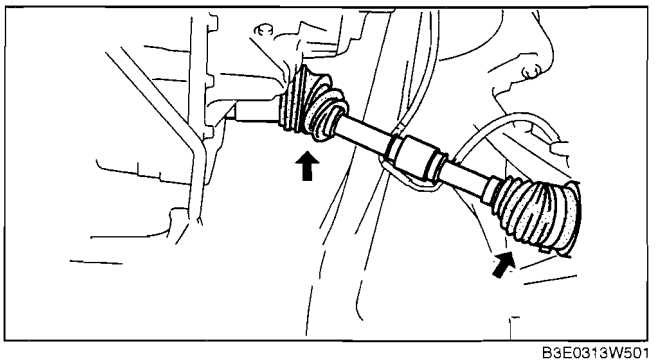


c3u0313w019

DRIVE SHAFT INSPECTION

id031300801800

1. Inspect the connections for any looseness.
   - If there is any malfunction, tighten or replace the applicable part.
2. Inspect the dust boot for damage and cracks.
   - If there is any malfunction, replace the applicable part.
3. Move the spline and joint up and down, left and right by hand and verify that there is no excessive play.
   - If there is any malfunction, replace the applicable part.



B3E0313W501

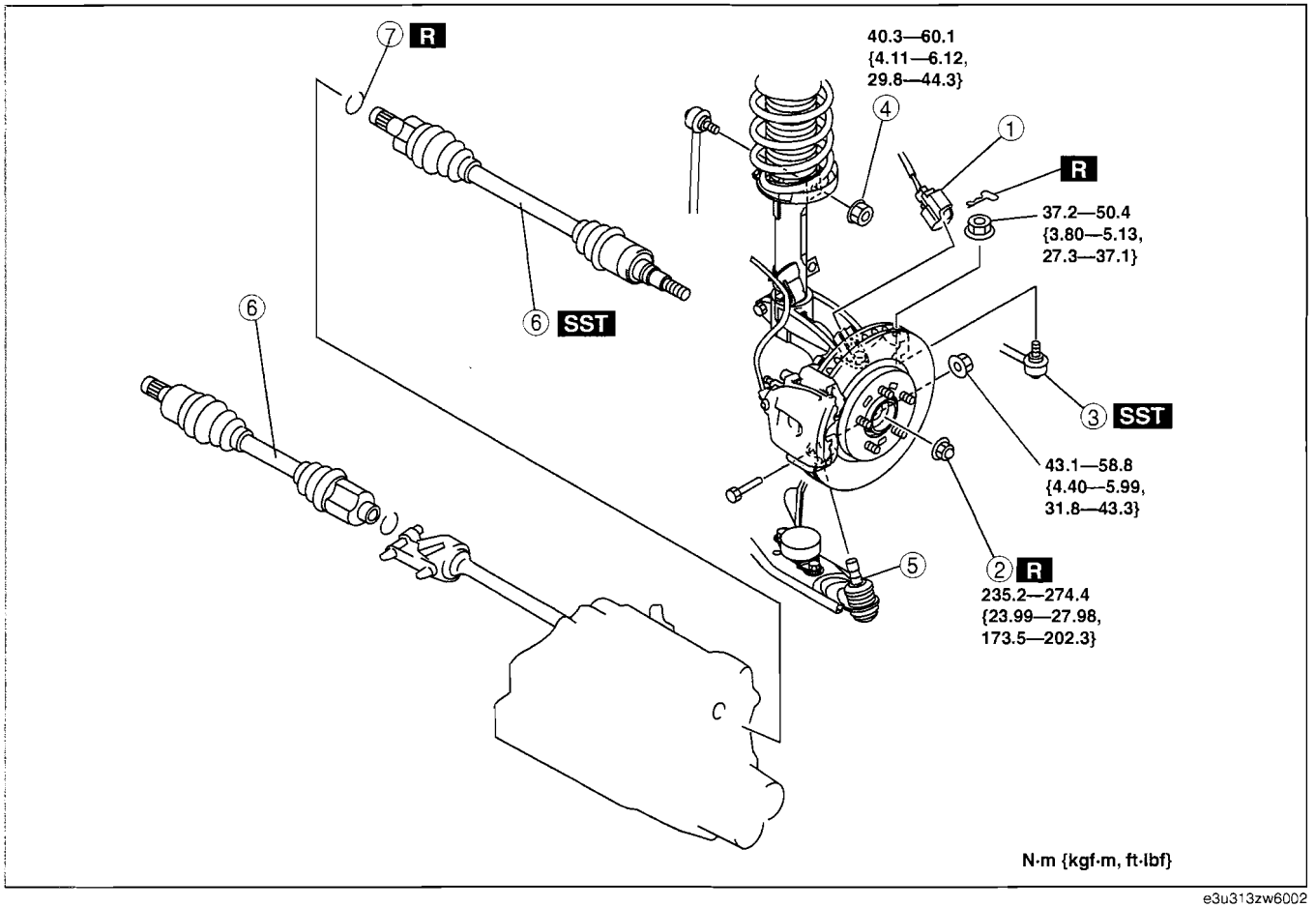
DRIVE SHAFT REMOVAL/INSTALLATION

id031300801900

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Drain the transaxle oil. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].) (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].) (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R]) (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



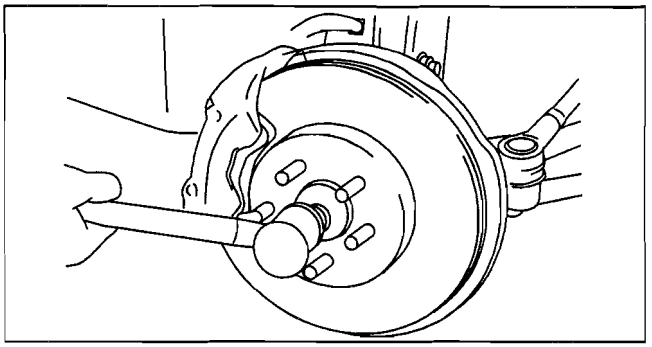
e3u313zw6002

1	ABS wheel-speed sensor connector
2	Locknut (See 03-11-3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.)
3	Tie-rod end ball joint (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.)

4	Stabilizer control link upper nut
5	Front lower arm ball joint
6	Drive shaft (See 03-13-10 Drive Shaft Removal Note.) (See 03-13-11 Drive Shaft Installation Note.)
7	Clip (See 03-13-11 Clip Installation Note.)

Drive Shaft Removal Note

1. Install a spare bolt onto the drive shaft.
2. Tap the bolt with a copper hammer and separate the drive shaft from the axle.
3. Separate the drive shaft from the wheel hub.

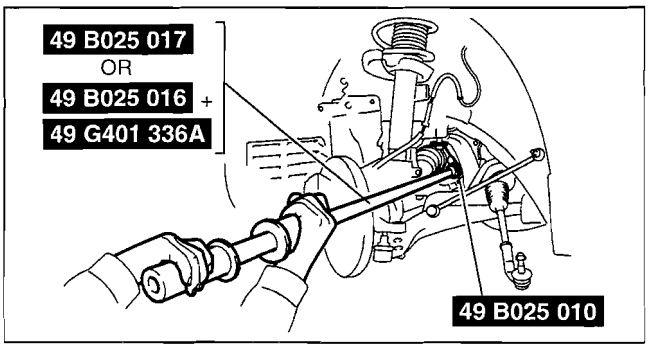


am3uuw0000042

4. Separate the drive shaft (LH) from the transaxle using the **SST**.

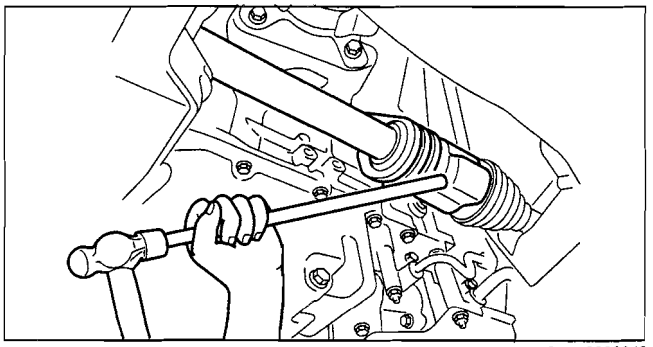
Caution

- **Be careful not to damage the transaxle oil seal with the bar.**



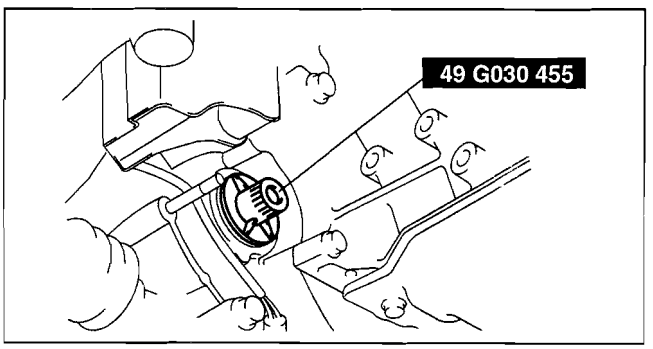
am3zzw0000338

5. Disconnect the drive shaft (RH) from the joint shaft by tapping the transaxle side outer ring with a brass bar and hammer.



am3uuw0000042

6. Install the **SST** to the transaxle after the drive shaft is removed.



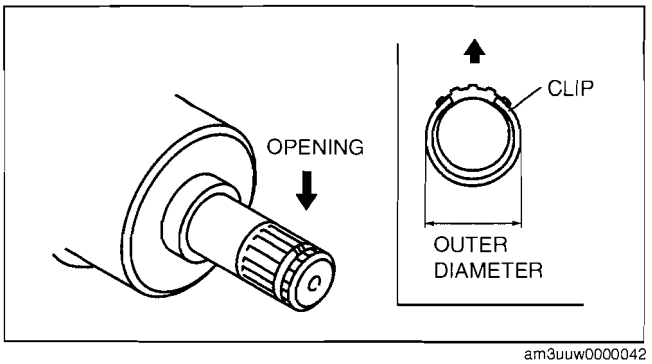
c3u0313w504

Clip Installation Note

1. Install a new drive shaft clip to the clip groove at the end of the drive shaft with the clip opening facing upward and the clip width within the specification.

   Standard
   LF (ATX): 29.5 mm {1.16 in}
   LF (MTX) and L3: 31.2 mm {1.23 in}
   L3 WITH TC: 33.2 mm {1.30 in}

2. After installation, measure the outer diameter.
   - If it exceeds the specification, repeat installation using a new clip.

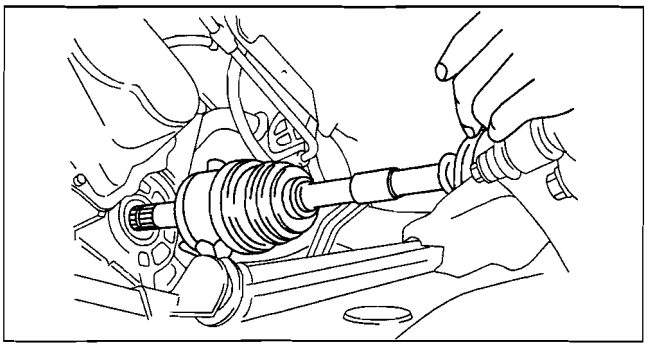


am3uuw0000042

Drive Shaft Installation Note
Left side

Caution
- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.**

1. Insert the drive shaft into the wheel hub.
2. Apply transaxle oil to the oil seal lip.
3. Install the drive shaft to the transaxle.
4. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.


am3uuw0000042

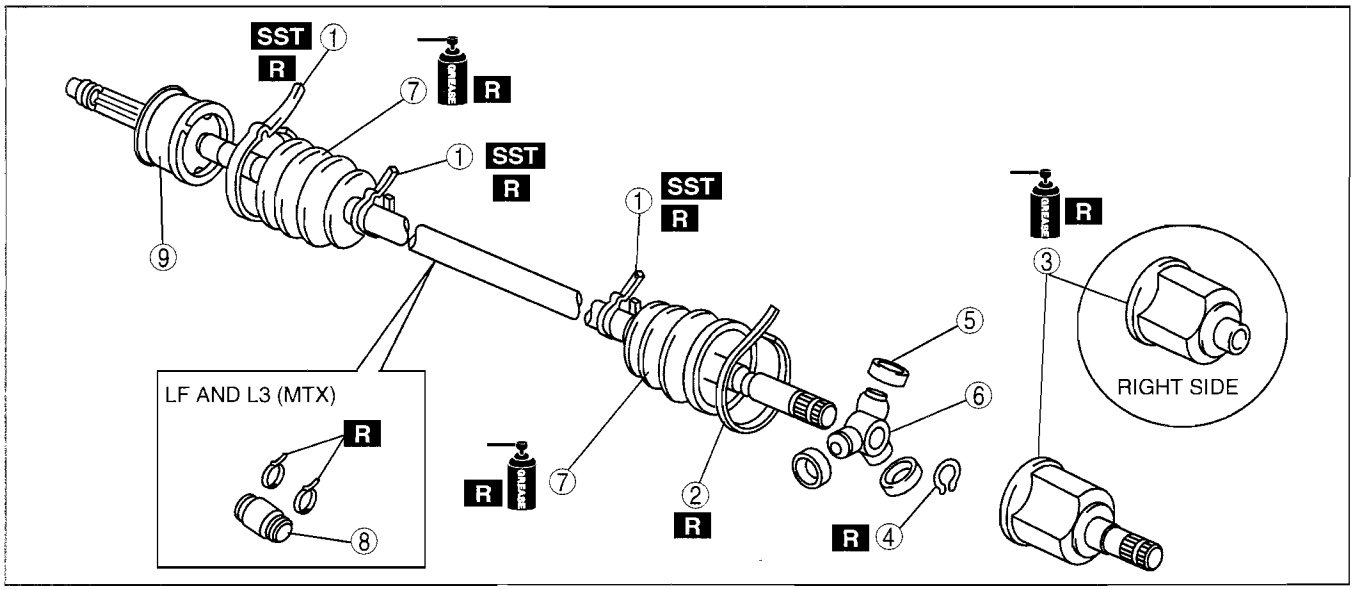
Right side

1. Install a new clip onto the joint shaft. (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
2. Insert the drive shaft to the wheel hub.
3. Insert the drive shaft to the joint shaft.
4. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.

DRIVE SHAFT (TRIPOD JOINT) DISASSEMBLY/ASSEMBLY

id031300801700

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000043

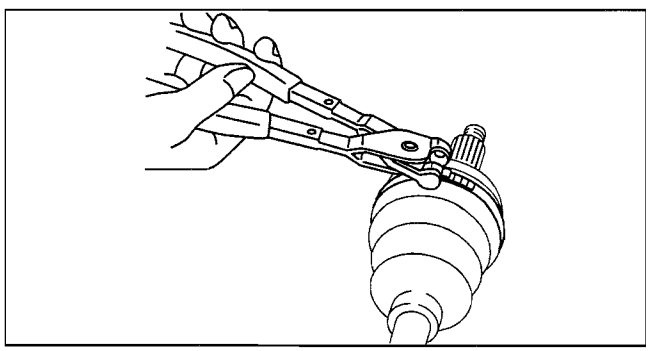
1	Boot band (wheel side, transaxle side smaller diameter) (See 03-13-12 Boot Band (Wheel Side, Transaxle Side Smaller Diameter) Disassembly Note.) (See 03-13-16 Boot Band (Wheel Side, Transaxle Side Smaller Diameter) Assembly Note.)
2	Boot band (transaxle side larger diameter) (See 03-13-13 Boot Band (Transaxle Side Larger Diameter) Disassembly Note.) (See 03-13-15 Boot Band (Transaxle Side Larger Diameter) Assembly Note.)
3	Outer ring (See 03-13-13 Outer Ring Disassembly Note.) (See 03-13-15 Outer Ring Assembly Note)
4	Snap ring (See 03-13-13 Snap Ring, Tripod Joint Disassembly Note.) (See 03-13-14 Tripod Joint, Snap Ring Assembly Note.)
5	Free ring (ATX)
6	Tripod joint (See 03-13-13 Snap Ring, Tripod Joint Disassembly Note.) (See 03-13-14 Tripod Joint, Snap Ring Assembly Note.)
7	Boot (See 03-13-13 Boot Disassembly Note.) (See 03-13-14 Boot Assembly Note.)
8	Dynamic damper (LF and L3 (MTX)) (See 03-13-14 Dynamic Damper Assembly Note.)
9	Shaft and ball joint component

Boot Band (Wheel Side, Transaxle Side Smaller Diameter) Disassembly Note

Note

- Remove the boot band only if there is a malfunction.

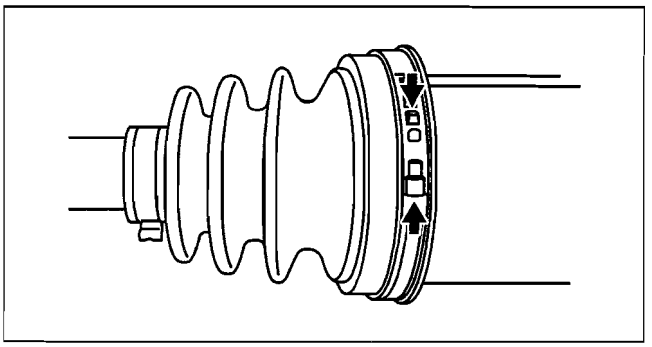
1. Remove the boot band using end clamp pliers.



am3uuw0000043

Boot Band (Transaxle Side Larger Diameter) Disassembly Note

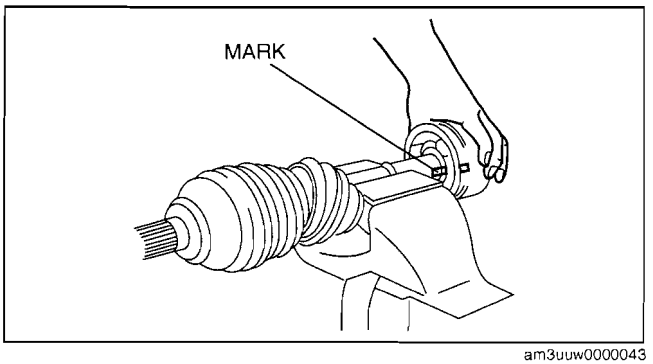
1. Pry up the boot band at the points indicated in the figure using pliers and remove the band.



am3uuw0000043

Outer Ring Disassembly Note

1. Place an alignment mark on the drive shaft and outer ring.
2. Remove the outer ring.



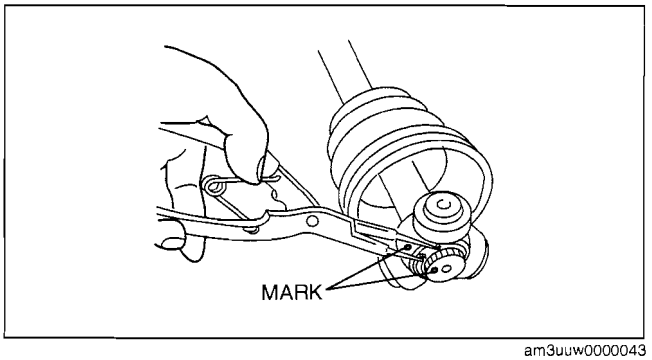
am3uuw0000043

Snap Ring, Tripod Joint Disassembly Note

1. Place an alignment mark on the shaft and tripod joint.
2. Remove the snap ring using snap ring pliers.
3. Remove the tripod joint from the shaft.

Caution

- **Do not tap the tripod joint with a hammer.**



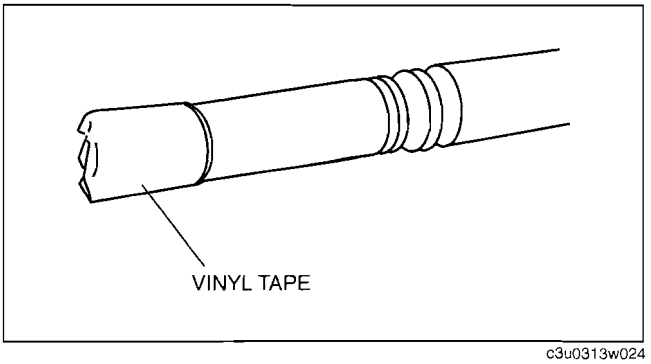
am3uuw0000043

Boot Disassembly Note

Note

- Remove the wheel side boot only if there is any malfunction.

1. Wrap the shaft splines with tape.
2. Remove the boot.



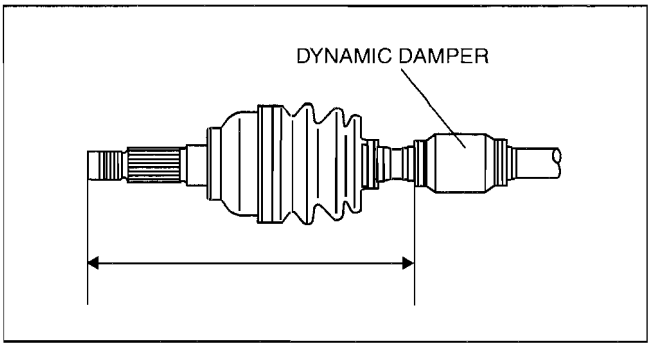
c3u0313w024

Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

   Standard length
   RH: 303.7—313.7 mm {11.96—12.35 in}
   LH: 288.7—298.7 mm {11.37—11.75 in}

2. Install the new boot band onto the dynamic damper.



am3uuw0000043

Boot Assembly Note

Note
- The boot shapes on the wheel side and the differential side are different. Do not install the wrong boot by mistake.

1. Fill the inside of the new dust boot (wheel side) with grease.

   Caution
   - **Do not touch the grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

   Grease amount
   LF and L3 (ATX): 103—113 g {3.64—3.98 oz}
   LF and L3 (MTX): 105—115 g {3.71—4.05 oz}
   L3 WITH TC: 120—130 g {4.24—4.58 oz}

2. Install the boot with the drive shaft spline still wrapped with vinyl tape.
3. Remove the vinyl tape.

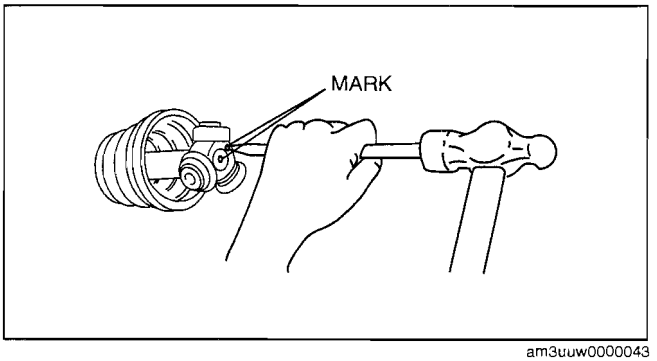
Tripod Joint, Snap Ring Assembly Note

1. While aligning the marks on the shaft and the tripod joint, insert the tripod joint using a bar and a hammer.

   Caution
   - **Do not tap the roller with a hammer.**

2. Insert a new snap ring using snap ring pliers.

   Caution
   - **Be sure the snap ring engages correctly in the groove of the shaft.**



am3uuw0000043

Outer Ring Assembly Note

1. Fill the outer ring and boot (transaxle side) with the specified grease.

Caution

- **Do not touch the grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount

LF and L3 (ATX): 105—119 g {3.71—4.19 oz}
LF and L3 (MTX): 140—145 g {4.95—5.11 oz}
L3 WITH TC (RH): 135—145 g {4.77—5.11 oz}
L3 WITH TC (LH): 174—188 g {6.15—6.63 oz}

2. Assemble the outer ring.
3. Set the drive shaft to the standard length.

Front drive shaft standard length

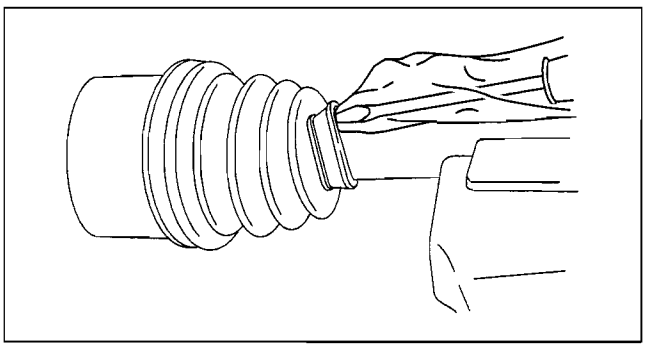
LF and L3 (ATX (RH)): 546.1—556.1 mm {21.50—21.89 in}
LF and L3 (ATX (LH)): 626.9—636.9 mm {24.69—25.07 in}
LF and L3 (MTX (RH)): 610.02—620.02 mm {24.02—24.41 in}
LF and L3 (MTX (LH)): 639.04—649.04 mm {25.16—25.55 in}
L3 WITH TC (RH): 587.55—597.55 mm {23.14—25.52 in}
L3 WITH TC (LH): 600.0—610.0 mm {23.63—24.01 in}

4. Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth wrapped screwdriver.

Caution

- **Do not let the grease leak.**
- **Do not damage the boot.**

5. Verify that the drive shaft length is within the specification under atmospheric pressure inside the boot.
   - If not within the specification, repeat from Step 3.



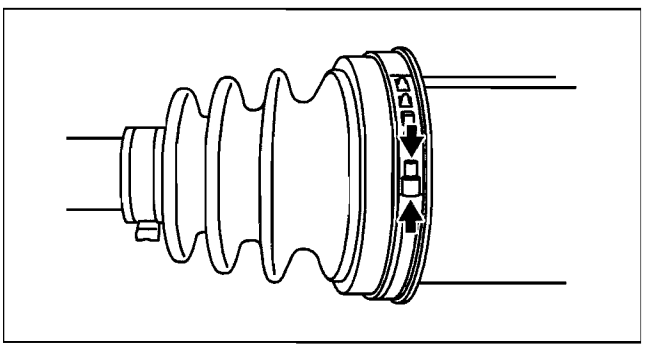
am3uuw0000043

Boot Band (Transaxle Side Larger Diameter) Assembly Note

1. Pry up the boot band at the points indicated in the figure using pliers and tighten the boot band.

Caution

- **Verify that the boot band is installed securely to the boot slot.**

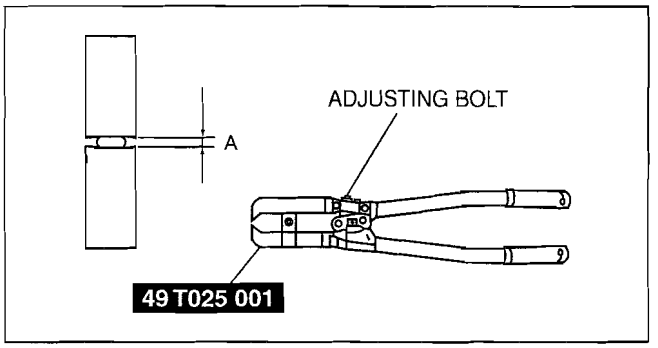


am3uuw0000044

Boot Band (Wheel Side, Transaxle Side Smaller Diameter) Assembly Note

1. Adjust opening width A by turning the adjusting bolt of the **SST**.

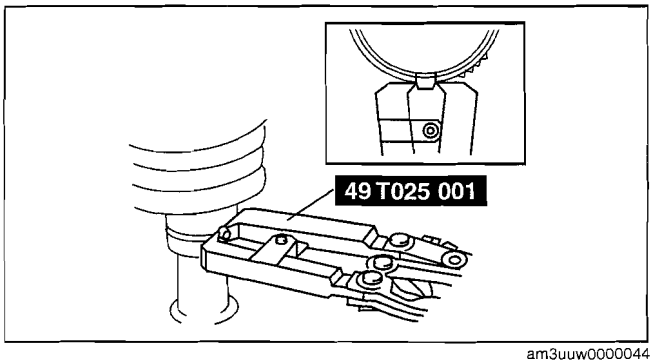
   Standard A
   1.6 mm {0.063 in}



c3u0313w027

2. Crimp the wheel side small boot band completely closed so there is no gap using the **SST**.
3. Verify that the boot band does not protrude from the boot band installation area.
   - If the boot band protrudes from the boot band installation area, replace the boot band and repeat Step 2.
4. Fill the boot with the repair kit grease.
5. Adjust opening width A of the **SST** to the specification.

   Standard A
   2.0 mm {0.079 in}



am3uuw0000044

6. Crimp the wheel side large boot band completely closed so there is no gap using the **SST**.
7. Verify that the boot band does not protrude from the boot band installation area.
   - If the boot band protrudes from the boot band installation area, replace the boot band and repeat Step 6.

03-50 TECHNICAL DATA

DRIVELINE/AXLE TECHNICAL DATA

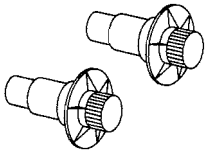
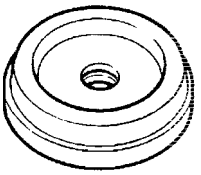
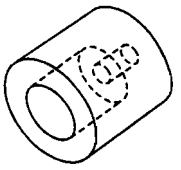
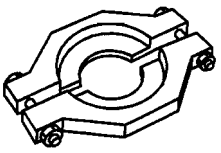
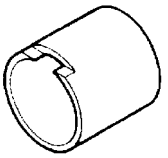
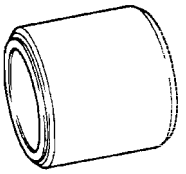
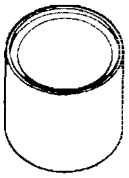
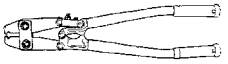
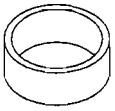
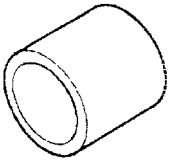
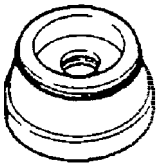
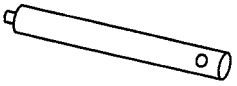
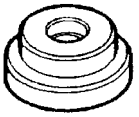
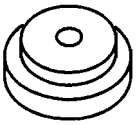
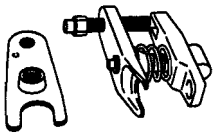
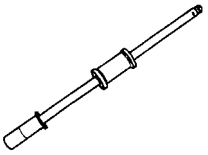
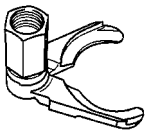
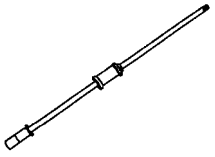
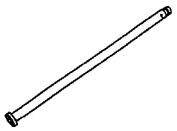
id035000800100

Item	Specification
Maximum front wheel bearing play	0.05 mm {0.002 in}
Maximum rear wheel bearing play	0.05 mm {0.002 in}
Front drive shaft standard length	LF and L3 (ATX (RH)): 546.1—556.1 mm {21.50—21.89 in} LF and L3 (ATX (LH)): 626.9—636.9 mm {24.69—25.07 in} LF and L3 (MTX (RH)): 610.02—620.02 mm {24.02—24.41 in} LF and L3 (MTX (LH)): 639.04—649.04 mm {25.16—25.55 in} L3 WITH TC (RH): 587.55—597.55 mm {23.14—25.52 in} L3 WITH TC (LH): 600.0—610.0 mm {23.63—24.01 in}

03-60 SERVICE TOOLS

DRIVELINE/AXLE SST

id036000800200

49 G030 455 Diff. side gear holder 	49 F027 004 Attachment ø80 	49 U027 005 Bearing installer 
49 H027 002 Bearing remover 	49 H034 201 Support block 	49 B014 001 Oil seal installer 
49 B025 004 Dust seal installer 	49 F027 003 Handle 	49 T025 001 Boot clamp crimper 
49 S231 626 Support block 	49 W027 003 Bearing installer 	49 F027 005 Attachment ø62 
49 G033 102 Handle 	49 G033 105 Attachment 	49 G033 106 Attachment 
49 T028 3A0 Ball Joint Puller set 	49 0223 630B Rear shaft puller body 	49 B025 010 Attachment 
49 B025 017 Sliding hammer 	49 B025 016 Extension 	—

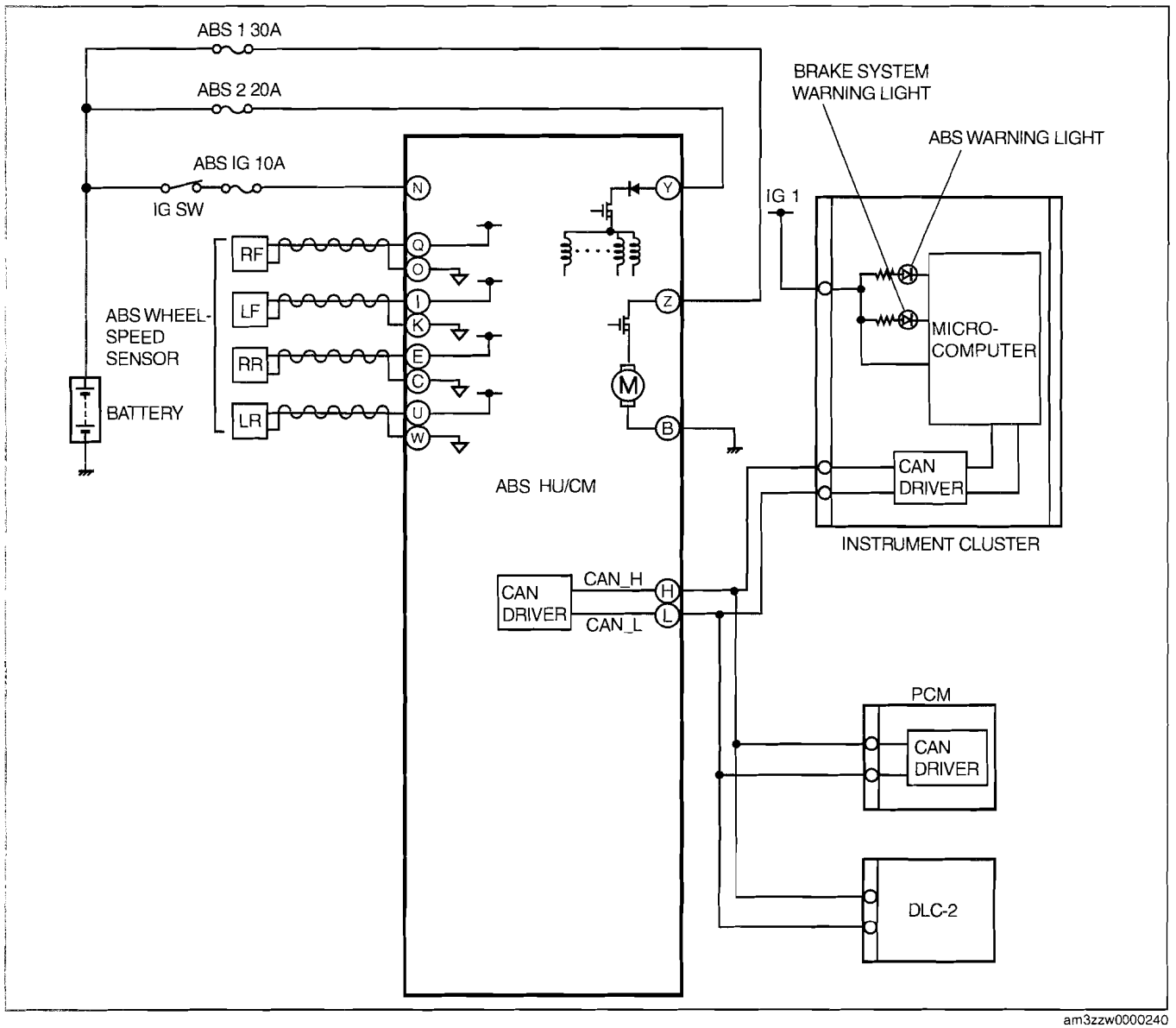
BRAKES

04
SECTION

04-02A ON-BOARD DIAGNOSTIC [ABS]

ABS SYSTEM WIRING DIAGRAM[ABS]

id0402a7802300



am3zzw0000240

ON-BOARD DIAGNOSIS[ABS]

id0402a7805500

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the ABS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - Provides a quick inspection of the ABS usually performed at the start of each diagnostic procedure.
  - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - Read/clear diagnostic results, PID monitor and record and active command modes.

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the ABS HU/CM memory.

PID/Data monitor and record

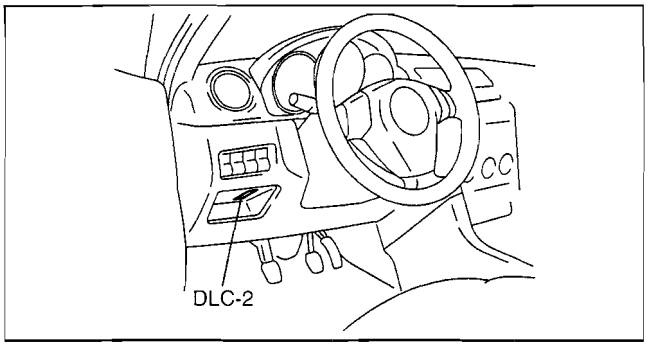
- This function allows you to access certain data values, input signals, calculated values, and system status information.

Active command modes

- This function allows you to control devices through the M-MDS.

Reading DTCs Procedure

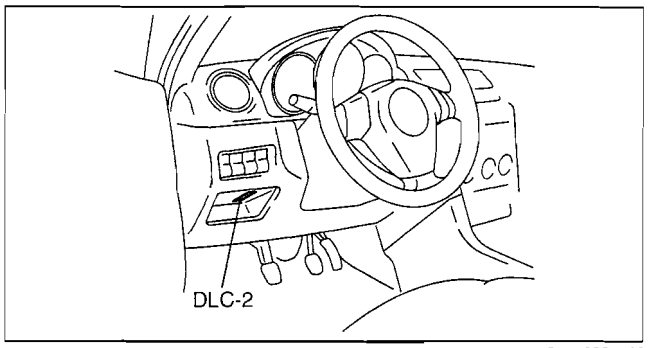
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the ABS. (See 04-02A-3 Clearing DTCs Procedures.)



am3zzw0000168

Clearing DTCs Procedures

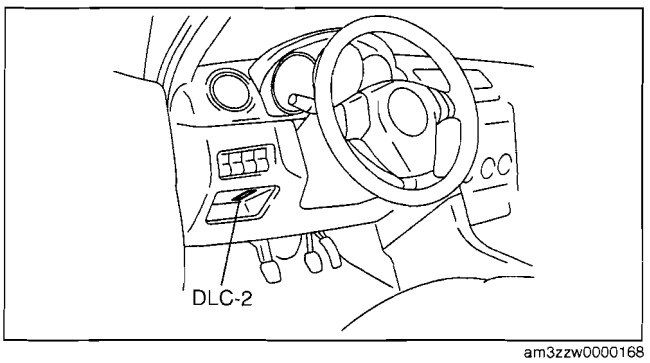
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



am3zzw0000168

PID/Data Monitor and Record Procedure

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3zzw0000168

Note

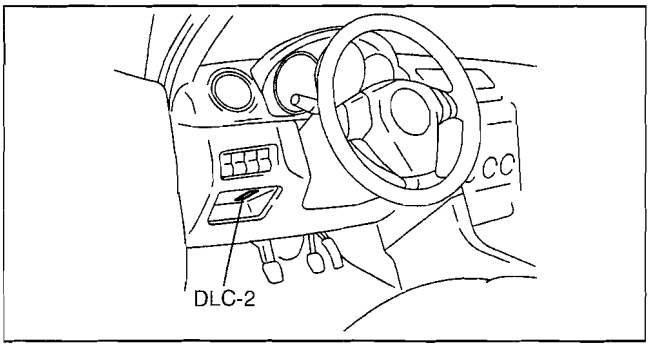
- The PID/Data monitor function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually using a active command modes function.

Active Command Modes Procedure

Note

- Performing the active command modes function while the engine is running could result in the DTC U2064 being stored in the instrument cluster. Therefore, perform the active command mode inspection while the engine is stopped. If the active command mode inspection is accidentally performed while the engine is running, inspect the instrument cluster for the recorded DTCs, and then clear any that have been recorded.

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
3. Select the active command modes from the PID table.
4. Perform the active command modes, inspect the operations for each parts.
   - If there is no operation sound from the relay, motor, and solenoid after the active command mode inspection is performed, it is possible that there is an open or short circuit in the wiring harness, relay, motor or solenoid, or sticking and operation malfunction.



am3zzw0000168

DTC Table

DTC M-MDS	System malfunction location	Page
B1317	Power supply system	(See 04-02A-6 DTC B1317, B1318[ABS].)
B1318	Power supply system	(See 04-02A-6 DTC B1317, B1318[ABS].)
B1342	ABS HU/CM (internal malfunction)	(See 04-02A-7 DTC B1342, C1267[ABS].)
C1095	Pump motor, motor relay	(See 04-02A-8 DTC C1095[ABS].)
C1141	LF ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1142	RF ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1143	LR ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1144	RR ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1145	RF ABS wheel-speed sensor	(See 04-02A-11 DTC C1145, C1155, C1165, C1175[ABS].)
C1155	LF ABS wheel-speed sensor	(See 04-02A-11 DTC C1145, C1155, C1165, C1175[ABS].)
C1165	RR ABS wheel-speed sensor	(See 04-02A-11 DTC C1145, C1155, C1165, C1175[ABS].)
C1175	LR ABS wheel-speed sensor	(See 04-02A-11 DTC C1145, C1155, C1165, C1175[ABS].)
C1233	LF ABS wheel-speed sensor/ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1234	RF ABS wheel-speed sensor/ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1235	RR ABS wheel-speed sensor/ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1236	LR ABS wheel-speed sensor/ABS sensor rotor	(See 04-02A-9 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS].)
C1267	ABS HU/CM (internal malfunction)	(See 04-02A-7 DTC B1342, C1267[ABS].)
C1446	Brake switch	(See 04-02A-13 DTC C1446[ABS].)
U1900	CAN line	(See 04-02A-14 DTC U1900, U2012[ABS].)
U2012	CAN line	(See 04-02A-14 DTC U1900, U2012[ABS].)

PID/DATA Monitor Table

PID name (definition)	Unit/Condition	Operation condition (reference)	Action	ABS HU/CM terminal
BOO_ABS (Brake pedal switch input)	On/Off	• Brake pedal depressed: On • Brake pedal released: Off	Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.)	—
CCNTABS (Number of continuous codes)	—	• DTCs detected: **1—255** • No DTCs detected: **0**	Perform the DTC inspection. (See 04-02A-4 DTC Table.)	—
LF_WSPD (Left front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: Vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)	I, K
LR_WSPD (Left rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: Vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)	U, W
RF_WSPD (Right front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: Vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)	Q, O
RR_WSPD (Right rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: Vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)	E, C

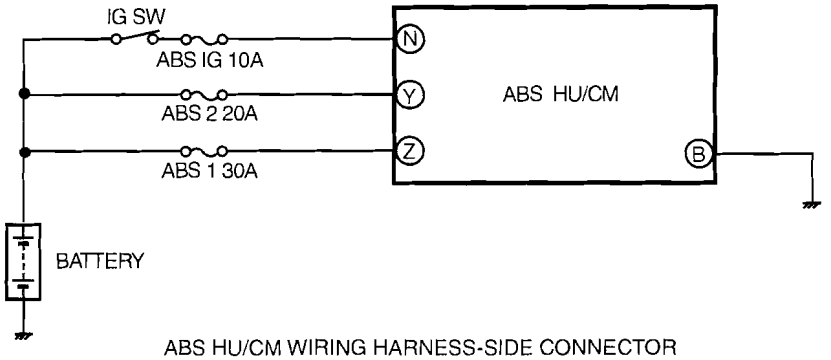
Active Command Modes Table

Command name	Output part	Operation	Operating condition
PMP_MOTOR	Pump motor	On/Off	Ignition switch at ON
RF_OUTLET	RF outlet solenoid valve		
RF_INLET	RF inlet solenoid valve		
LF_OUTLET	LF outlet solenoid valve		
LF_INLET	LF inlet solenoid valve		
RR_OUTLET	RR outlet solenoid valve		
RR_INLET	RR inlet solenoid valve		
LR_OUTLET	LR outlet solenoid valve		
LR_INLET	LR inlet solenoid valve		

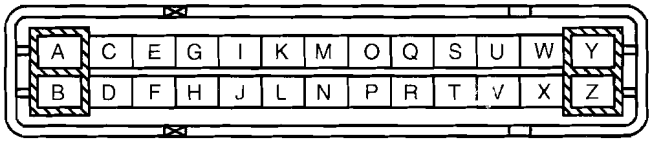
DTC B1317, B1318[ABS]

id0402a7806500

DTC B1317, B1318	Power supply system
DETECTION CONDITION	• B1317 — High ignition voltage (**16 V or more**) is detected at the voltage monitor of the solenoid valve or motor monitor. • B1318 — When driving the vehicle at **20 km/h {12.4 mph} or more**, low ignition voltage (**10 V or less**) is detected at the voltage monitor of the solenoid valve or motor monitor.
POSSIBLE CAUSE	• ABS 1 30A/ABS 2 20A/ABS IG 10A fuse malfunction • Open or short circuit in wiring harness between ABS HU/CM terminal N and battery • Open or short circuit in wiring harness between ABS HU/CM terminal Y and battery • Open or short circuit in wiring harness between ABS HU/CM terminal Z and battery • Open circuit in wiring harness between ABS HU/CM terminal B and body ground • Battery deterioration • Generator malfunction • Poor connection at connectors (female terminal)



ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY VOLTAGE** • Is the battery positive terminal voltage normal?	Yes	Inspect for normal connection of the battery terminals. Go to the next step.
		No	Charge or replace the battery, then go to Step 6. (See 01-17A-6 BATTERY RECHARGING[LF, L3].) (See 01-17A-2 BATTERY REMOVAL/ INSTALLATION[LF, L3].)
2	**INSPECT BATTERY GRAVITY** • Is battery specific gravity as specified?	Yes	Go to the next step.
		No	Replace the battery, then go to Step 6. (See 01-17A-2 BATTERY REMOVAL/ INSTALLATION[LF, L3].)
3	**INSPECT CHARGING SYSTEM** • Are the generator and the drive belt tensions normal?	Yes	Go to the next step.
		No	Replace the generator and/or drive belt if necessary. (See 01-17A-6 GENERATOR REMOVAL/ INSTALLATION[LF, L3].) (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].) Go to Step 6.

STEP	INSPECTION		ACTION
4	**INSPECT ABS HU/CM POWER SUPPLY FOR OPEN CIRCUIT** • Disconnect the ABS HU/CM connectors. • Turn the ignition switch to the ON position. • Measure the voltage between following connector terminals of the ABS HU/CM (vehicle harness-side) and body ground: — ABS HU/CM: N—Body ground — ABS HU/CM: Y—Body ground — ABS HU/CM: Z—Body ground • Is the voltage **10 V or more**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
5	**INSPECT ABS HU/CM GROUND FOR POOR GROUND OR OPEN CIRCUIT** • Turn the ignition switch off. • Measure the resistance between following connector terminal of ABS HU/CM (vehicle harness-side) and body ground: — ABS HU/CM: B—Body ground • Is the resistance **within 0—1 ohm**?	Yes	Go to the next step.
		No	If there is open circuit: • Repair or replace the wiring harness, then go to the next step. If resistance is not within specification: • Repair or replace the poor ground part, then go to the next step.
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Start the engine and drive the vehicle at **20 km/h {12.4 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

DTC B1342, C1267[ABS]

id0402a7803200

DTC B1342, C1267	ABS HU/CM (internal malfunction)
DETECTION CONDITION	• The ABS HU/CM on-board diagnostic function detects control module internal malfunction.
POSSIBLE CAUSE	• ABS HU/CM internal malfunction

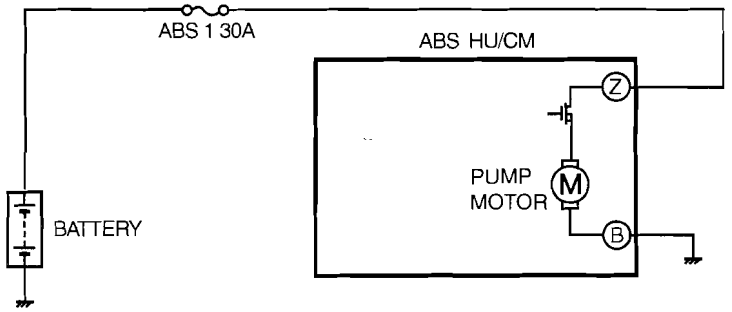
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY NO ABS HU/CM MALFUNCTION** • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Start the engine and drive the vehicle at **10km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

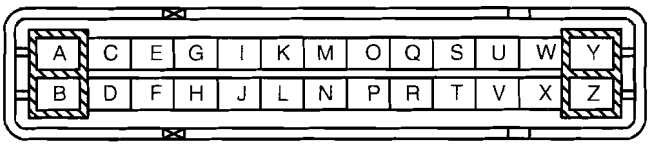
DTC C1095[ABS]

id0402a7802800

DTC C1095	Pump motor, motor relay
DETECTION CONDITION	• ABS motor monitor signal does not correspond to ABS HU/CM OFF signal. • ABS motor monitor signal does not correspond to ABS HU/CM ON signal. • ABS motor monitor OFF signal is input within specified time limit when motor signal is switched from ON to OFF by ABS HU/CM.
POSSIBLE CAUSE	• ABS 1 (30 A) fuse malfunction • Open circuit or short to ground in the wiring harness between the battery and ABS HU/CM terminal Z • Open circuit in the wiring harness between ABS HU/CM terminal B and body ground • Open or short circuit in ABS HU/CM internal motor relay, or stuck motor relay • Open or short circuit in ABS HU/CM internal pump motor, or frozen pump motor • Poor connection at connectors (female terminal)



ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS FUSE CONDITION** • Is the ABS fuse (ABS 1 30 A) normal?	Yes	Go to the next step.
		No	Replace the ABS fuse, then go to Step 6.
2	**VERIFY PUMP MOTOR OPERATION** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Turn the ignition switch to the ON position. • Access PMP _MOTOR active command modes using the M-MDS. • Does the pump motor operate?	Yes	Go to the next step.
		No	Replace the ABS HU/CM, then go to Step 6. (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
3	**INSPECT MOTOR RELAY POWER SUPPLY FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect the ABS HU/CM connector. • Inspect for continuity between ABS HU/CM terminal Z and the positive battery terminal. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
4	**INSPECT MOTOR RELAY POWER SUPPLY FOR SHORT CIRCUIT** • Inspect for continuity between ABS HU/CM terminal Z and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 6.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT PUMP MOTOR GROUND FOR OPEN CIRCUIT** • Inspect for continuity between ABS HU/CM terminal B and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

04-02A

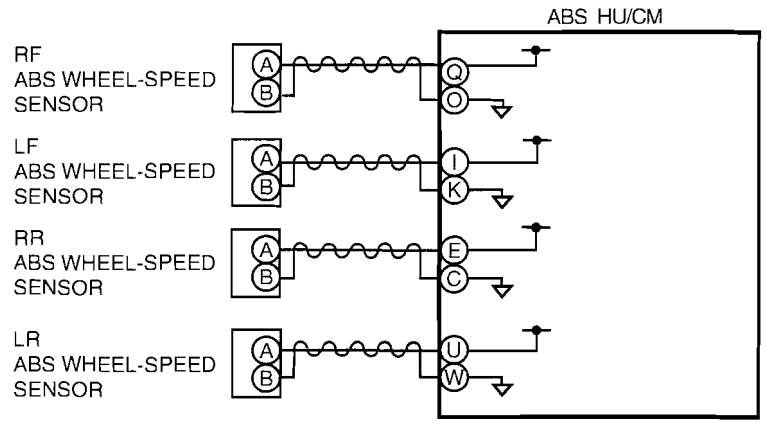
DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[ABS]

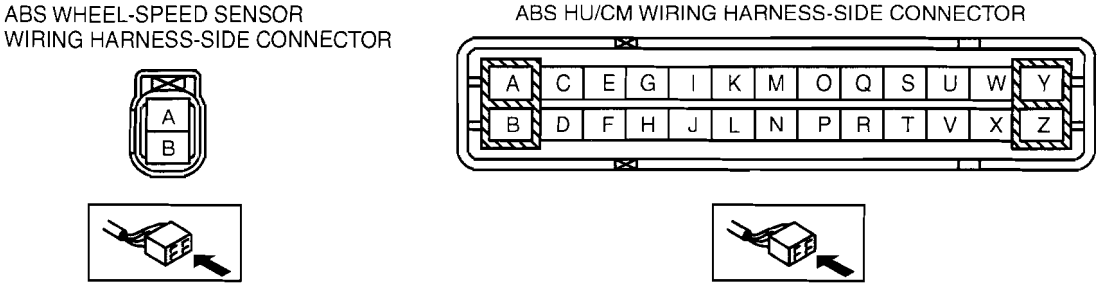
id0402a7803300

Note

- When only the driving wheels are rotated while the vehicle is jacked up, DTCs C1235 and C1236 are input to the memory.

DTC	C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236	ABS wheel-speed sensor/ABS sensor rotor
DETECTION CONDITION	• C1141, C1142, C1143, C1144 — Periodic abnormality is detected in the signal wave pattern from the ABS wheel-speed sensors. • C1234, C1233, C1235, C1236 — Wheel speed signal is not input or extremely low wheel speed signal is input from any of the four wheels when driving at a vehicle speed of **10 km/h {6.2 mph} or more**. — A large, sudden change in wheel speed signal is detected. — ABS control operates for **28 s or more**.	
POSSIBLE CAUSE	• ABS wheel-speed sensor malfunction • ABS sensor rotor malfunction (foreign material adhering) • Improper installation of ABS wheel-speed sensor and/or sensor rotor • Excessive clearance between the ABS wheel-speed sensor and sensor rotor • Continuous ABS operation	





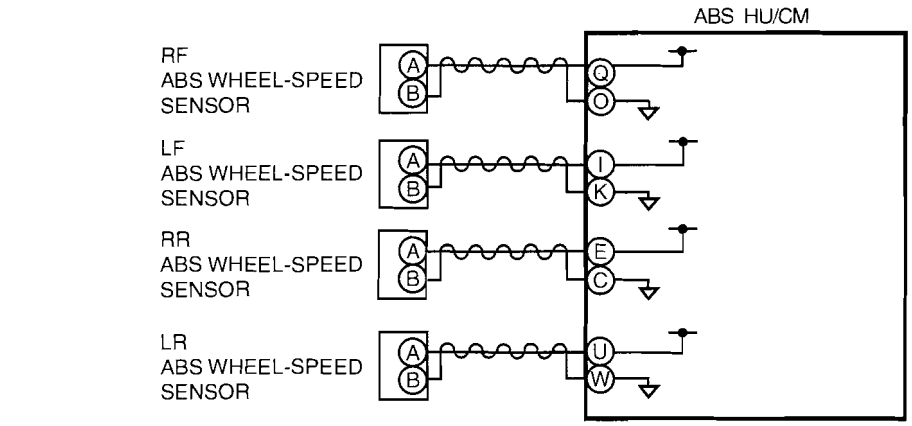
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PID FOR ABS WHEEL-SPEED SENSOR OUTPUT ERROR USING M-MDS** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Select the following PIDs using the M-MDS: LF_WSPD LR_WSPD RF_WSPD RR_WSPD • Drive the vehicle. • Verify that the vehicle speeds detected by the four ABS wheel-speed sensors are approximately the same. • Are the vehicle speeds approximately the same?	Yes	Go to Step 3.
		No	Go to the next step.
2	**INSPECT FOR SHORT TO GROUND BETWEEN ABS WHEEL-SPEED SENSOR CONNECTORS AND GROUND** • Disconnect the ABS wheel-speed sensor connectors. • Inspect for no continuity between the following ABS wheel-speed sensor connector terminals (vehicle harness-side) and body ground: — ABS wheel-speed sensor (RF): B—Body ground — ABS wheel-speed sensor (LF): B—Body ground — ABS wheel-speed sensor (RR): B—Body ground — ABS wheel-speed sensor (LR): B—Body ground • Is the continuity normal?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
3	**INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE.** • Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.) • Is the clearance normal? **Clearance** **Front: 2.1 mm {0.082 in} or less** **Rear: 1.46 mm {0.057 in} or less**	Yes	Go to the next step.
		No	Replace the ABS wheel-speed sensor, then go to Step 6. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
4	**VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION** • Is the result normal?	Yes	Go to Step 6.
		No	Replace the wheel hub component, then go to Step 6. (See 03-11-3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.) (See 03-12-3 WHEEL HUB COMPONENT REMOVAL/INSTALLATION.)
5	**INSPECT IF MALFUNCTION OCCURRED DUE TO INTERNAL MALFUNCTION OF HYDRAULIC UNIT (CLOGGING IN PIPING)** • Perform the ABS system operation inspection. (See 04-13-2 ABS SYSTEM INSPECTION.) • Is the system normal?	Yes	Go to the next step.
		No	Replace the hydraulic unit, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

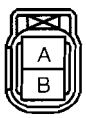
DTC C1145, C1155, C1165, C1175[ABS]

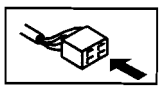
id0402a7805700

DTC C1145, C1155, C1165, C1175	ABS wheel-speed sensor
DETECTION CONDITION	• Open circuit or short to ground has been detected in the ABS wheel-speed sensor wiring harness on any of the four vehicle wheels.
POSSIBLE CAUSE	• Open circuit or short to ground in the wiring harness between the following ABS HU/CM terminals and ABS wheel-speed sensor terminals: — ABS HU/CM terminal Q—RF ABS wheel-speed sensor terminal A — ABS HU/CM terminal O—RF ABS wheel-speed sensor terminal B — ABS HU/CM terminal I—LF ABS wheel-speed sensor terminal A — ABS HU/CM terminal K—LF ABS wheel-speed sensor terminal B — ABS HU/CM terminal E—RR ABS wheel-speed sensor terminal A — ABS HU/CM terminal C—RR ABS wheel-speed sensor terminal B — ABS HU/CM terminal U—LR ABS wheel-speed sensor terminal A — ABS HU/CM terminal W—LR ABS wheel-speed sensor terminal B • ABS wheel-speed sensor malfunction • Poor connection at connectors (female terminal)

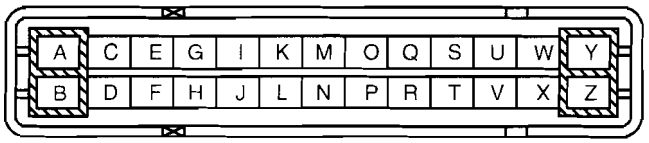


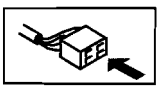
ABS WHEEL-SPEED SENSOR
WIRING HARNESS-SIDE CONNECTOR





ABS HU/CM WIRING HARNESS-SIDE CONNECTOR





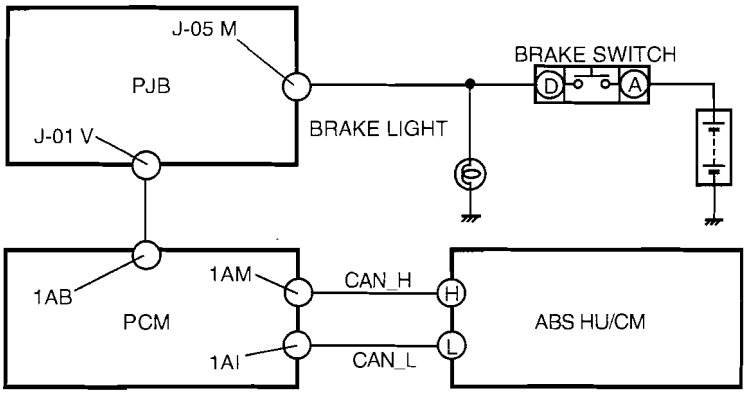
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS WHEEL-SPEED SENSOR FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the ABS HU/CM connectors. • Inspect for continuity between the following ABS HU/CM connector terminals (vehicle harness-side) and body ground: — RF ABS wheel-speed sensor(+): Q — RF ABS wheel-speed sensor(-): O — LF ABS wheel-speed sensor(+): I — LF ABS wheel-speed sensor(-): K — RR ABS wheel-speed sensor(+): E — RR ABS wheel-speed sensor(-): C — LR ABS wheel-speed sensor(+): U — LR ABS wheel-speed sensor(-): W • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 3.
2	**INSPECT ABS WHEEL-SPEED SENSOR WIRING HARNESS FOR SHORT TO GROUND** • Disconnect the ABS wheel-speed sensor connectors. • Inspect for continuity between the following ABS HU/CM connector terminals (vehicle harness-side) and body ground: — RF ABS wheel-speed sensor(+): Q — RF ABS wheel-speed sensor(-): O — LF ABS wheel-speed sensor(+): I — LF ABS wheel-speed sensor(-): K — RR ABS wheel-speed sensor(+): E — RR ABS wheel-speed sensor(-): C — LR ABS wheel-speed sensor(+): U — LR ABS wheel-speed sensor(-): W • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 4.
		No	Replace the ABS wheel-speed sensor, then go to Step 4. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
3	**INSPECT FOR OPEN CIRCUIT IN ABS WHEEL-SPEED SENSOR WIRING HARNESS** • Inspect for continuity between the ABS HU/CM connectors (vehicle harness-side) and the following vehicle harness-side connector terminals of the ABS wheel-speed sensors: — RF ABS wheel-speed sensor(+): Q—A — RF ABS wheel-speed sensor(-): O—B — LF ABS wheel-speed sensor(+): I—A — LF ABS wheel-speed sensor(-): K—B — RR ABS wheel-speed sensor(+): E—A — RR ABS wheel-speed sensor(-): C—B — LR ABS wheel-speed sensor(+): U—A — LR ABS wheel-speed sensor(-): W—B • Is there continuity?	Yes	Go to the next step.
		No	Replace the ABS wheel-speed sensor, then go to the next step. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
4	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

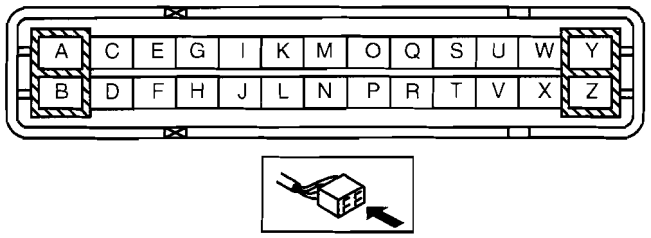
DTC C1446[ABS]

id0402a7803400

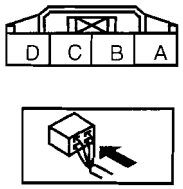
DTC C1446	Brake switch
DETECTION CONDITION	• Brake switch ON signal is input for **6 min or more** when driving at a vehicle speed of **20 km/h {12.4 mph} or more**. • Brake switch ON signal is not input even though the control module determines vehicle deceleration.
POSSIBLE CAUSE	• Open or short circuit in wiring harness between the brake switch and PJB terminal • Open or short circuit in wiring harness between the PJB and PCM terminals • Brake switch malfunction • Poor connection at connectors (female terminal)



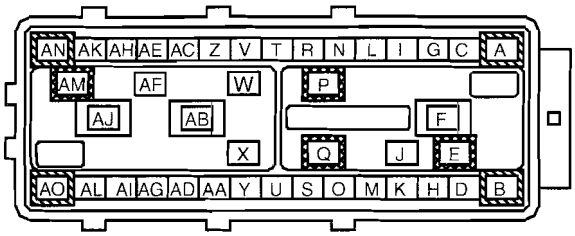
ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



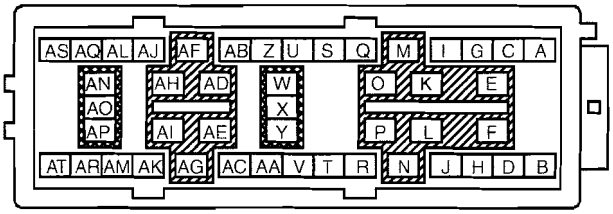
BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



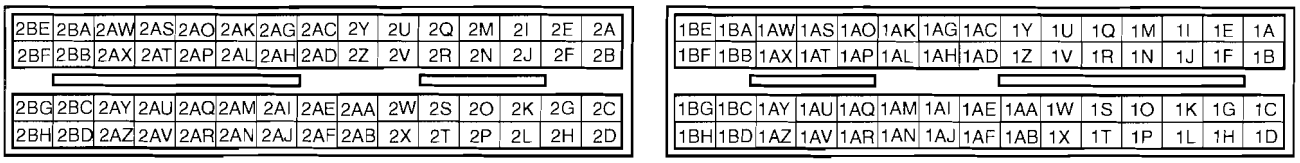
PJB J-01 WIRING HARNESS-SIDE CONNECTOR



PJB J-05 WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OPEN OR SHORT CIRCUIT IN BRAKE SWITCH SIGNAL** • Turn the ignition switch to the ON position. • Measure the voltage between the PCM terminal 1AB and body ground when the brake pedal is depressed and released: **Voltage** **Brake pedal depressed: B+** **Brake pedal released:** **1 V or less**	Yes	Go to Step 5.
		No	If it is **B+** under any condition, then go to the next step. If it is **1 V or less** under any condition, then go to Step 3.
2	**INSPECT BRAKE SWITCH SIGNAL FOR SHORT TO POWER SUPPLY CIRCUIT** • Disconnect the brake switch connector. • Measure the voltage between the brake switch connector terminal D (vehicle harness-side) and body ground. • Is the voltage **1 V or less**?	Yes	Go to Step 4.
		No	Repair or replace the wiring harness between the PCM and brake switch, then go to Step 5
3	**INSPECT BRAKE SWITCH SIGNAL FOR OPEN CIRCUIT** • Disconnect the PCM connectors. • Disconnect the brake switch connector. • Inspect continuity between the PCM connector terminal 1AB (vehicle harness-side) and brake switch terminal D: • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the PCM and brake switch, then go to Step 5.
4	**INSPECT BRAKE SWITCH** • Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to the next step.
		No	Replace the brake switch, then go to the next step. (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
5	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) • Start the engine and drive the vehicle at **20 km/h {12.4 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
6	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	DTC troubleshooting completed.

DTC U1900, U2012[ABS]

id0402a7803500

DTC U1900, U2012	CAN line
DETECTION CONDITION	• U1900 — Communication error with PCM is detected in CAN communication. • U2012 — CAN system wiring harness open or short circuit is detected.
POSSIBLE CAUSE	• CAN system wiring harness open or short circuit with PCM • PCM malfunction

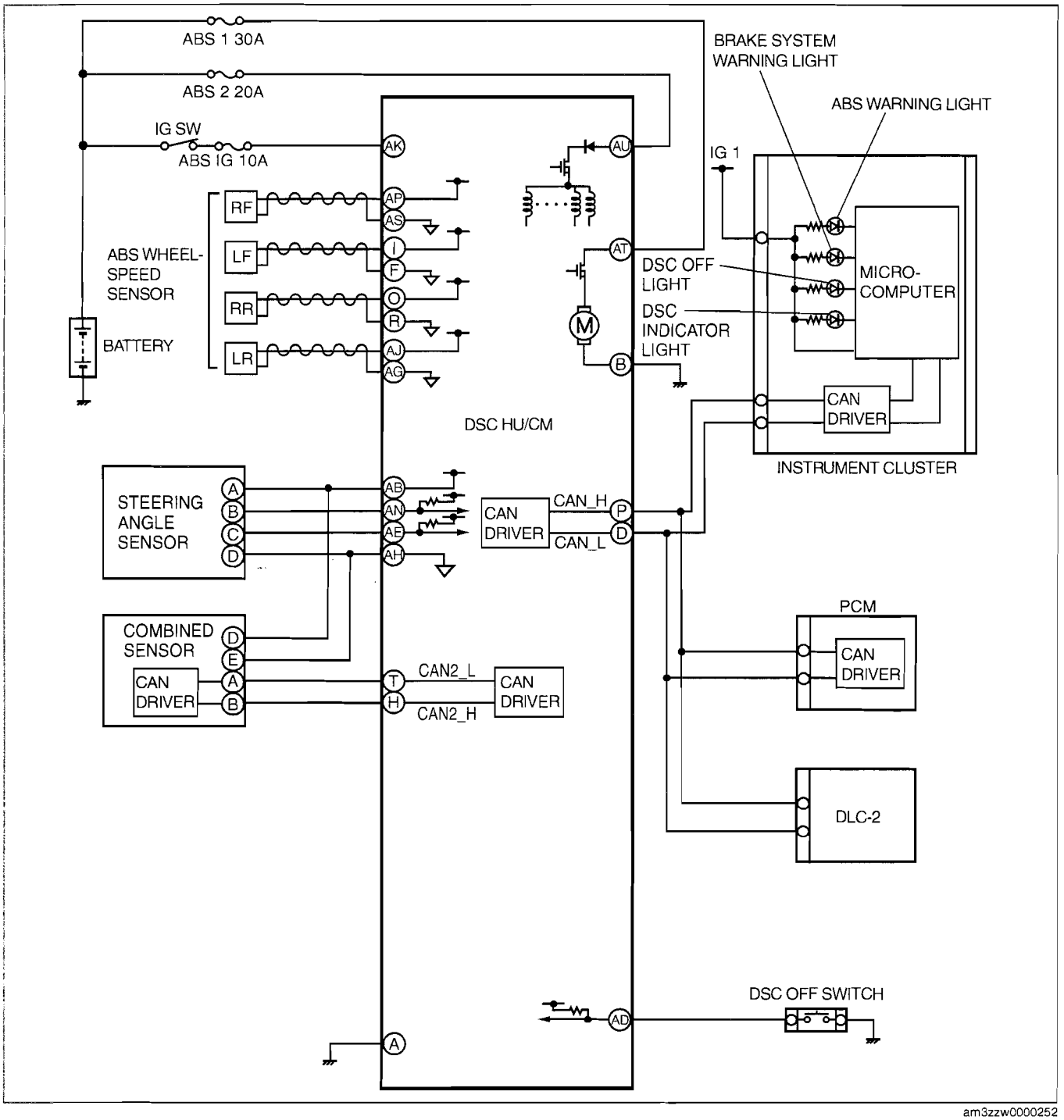
Diagnostic procedure

- Inspect according to diagnostic procedure in BODY & ACCESSORIES. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)

04-02B ON-BOARD DIAGNOSTIC [DYNAMIC STABILITY CONTROL (DSC)]

DYNAMIC STABILITY CONTROL WIRING DIAGRAM[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2804700



am3zzw0000252

ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2800200

On-Board Diagnostic (OBD) Test Description

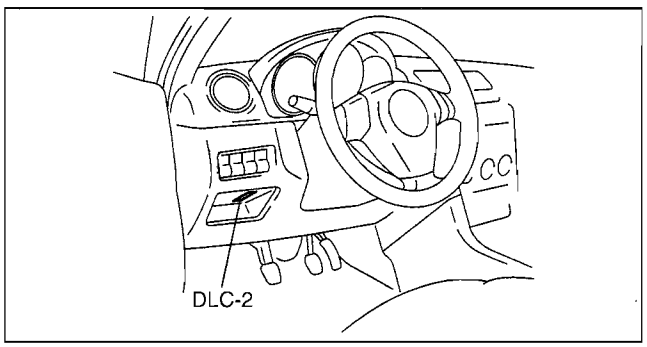
- The OBD test inspects the integrity and function of the DSC and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - — Provides a quick inspection of the DSC usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - — Read/clear diagnostic results, PID monitor and record and active command modes.

Read/clear diagnostic results
- This function allows you to read or clear DTCs in the DSC HU/CM memory.

PID/Data monitor and record
- This function allows you to access certain data values, input signals, calculated values, and system status information.

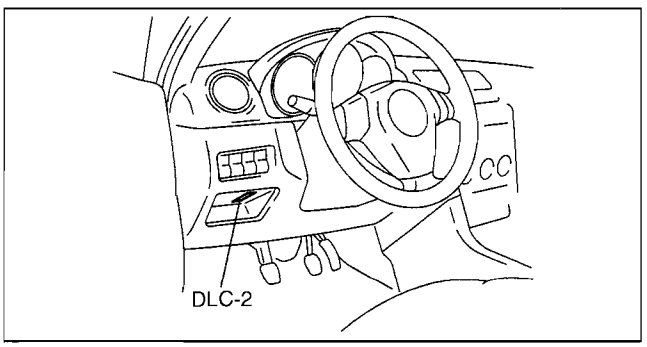
Active command modes
- This function allows you to control devices through the M-MDS.

Reading DTCs Procedure
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the DSC. (See 04-02B-3 Clearing DTCs Procedures.)



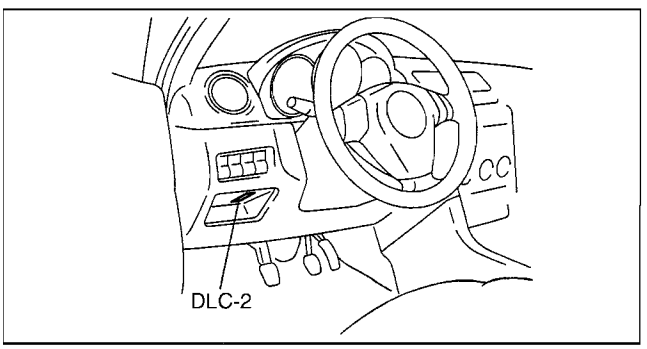
am3zzw0000163

Clearing DTCs Procedures
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



am3zzw0000163

PID/Data Monitor and Record Procedure
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



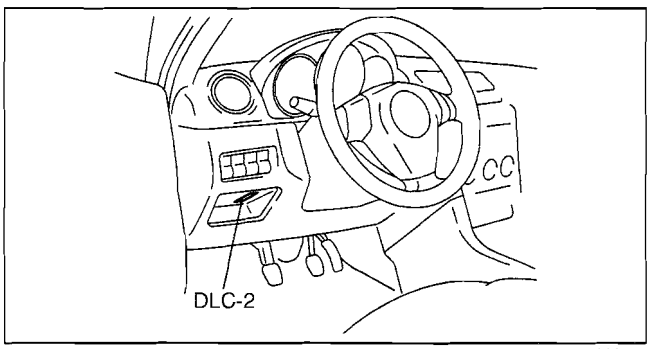
am3zzw0000163

Note
- The PID/Data monitor function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually using a active command modes function.

Active Command Modes Procedure

Note
- Performing the active command modes function while the engine is running could result in the DTC U2064 being stored in the instrument cluster. Therefore, perform the active command mode inspection while the engine is stopped. If the active command mode inspection is accidentally performed while the engine is running, inspect the instrument cluster for the recorded DTCs, and then clear any that have been recorded.

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
3. Select the active command modes from the PID table.
4. Perform the active command modes, inspect the operations for each parts.
   - If there is no operation sound from the relay, motor, and solenoid after the active command mode inspection is performed, it is possible that there is an open or short circuit in the wiring harness, relay, motor or solenoid, or sticking and operation malfunction.



am3zzw0000163

DTC Table

DTC M-MDS	System malfunction location	Page
B1317	Power supply system	(See 04-02B-8 DTC B1317, B1318[DYNAMIC STABILITY CONTROL (DSC)].)
B1318	Power supply system	(See 04-02B-8 DTC B1317, B1318[DYNAMIC STABILITY CONTROL (DSC)].)
B1342	DSC HU/CM (internal malfunction)	(See 04-02B-10 DTC B1342, C1267, C1730[DYNAMIC STABILITY CONTROL (DSC)].)
B2141	Vehicle data not recorded	(See 04-02B-10 DTC B2141[DYNAMIC STABILITY CONTROL (DSC)].)
B2741	Combined sensor (internal malfunction)	(See 04-02B-11 DTC B2741[DYNAMIC STABILITY CONTROL (DSC)].)
C1093	DSC OFF switch	(See 04-02B-12 DTC C1093[DYNAMIC STABILITY CONTROL (DSC)].)
C1095	Pump motor, motor relay	(See 04-02B-13 DTC C1095[DYNAMIC STABILITY CONTROL (DSC)].)
C1141	LF ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1142	RF ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1143	LR ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)

DTC M-MDS	System malfunction location	Page
C1144	RR ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1145	RF ABS wheel-speed sensor	(See 04-02B-16 DTC C1145, C1155, C1165, C1175[DYNAMIC STABILITY CONTROL (DSC)].)
C1155	LF ABS wheel-speed sensor	(See 04-02B-16 DTC C1145, C1155, C1165, C1175[DYNAMIC STABILITY CONTROL (DSC)].)
C1165	RR ABS wheel-speed sensor	(See 04-02B-16 DTC C1145, C1155, C1165, C1175[DYNAMIC STABILITY CONTROL (DSC)].)
C1175	LR ABS wheel-speed sensor	(See 04-02B-16 DTC C1145, C1155, C1165, C1175[DYNAMIC STABILITY CONTROL (DSC)].)
C1233	LF ABS wheel-speed sensor/ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1234	RF ABS wheel-speed sensor/ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1235	RR ABS wheel-speed sensor/ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1236	LR ABS wheel-speed sensor/ABS sensor rotor	(See 04-02B-14 DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)].)
C1267	DSC HU/CM (internal malfunction)	(See 04-02B-10 DTC B1342, C1267, C1730[DYNAMIC STABILITY CONTROL (DSC)].)
C1277	Steering angle sensor	(See 04-02B-18 DTC C1277, C1278, C1306, C1307[DYNAMIC STABILITY CONTROL (DSC)].)
C1278	Steering angle sensor	(See 04-02B-18 DTC C1277, C1278, C1306, C1307[DYNAMIC STABILITY CONTROL (DSC)].)
C1279	Combined sensor system	(See 04-02B-20 DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)].)
C1280	Combined sensor system	(See 04-02B-20 DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)].)
C1281	Combined sensor system	(See 04-02B-20 DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)].)
C1282	Combined sensor system	(See 04-02B-20 DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)].)
C1288	Brake fluid pressure sensor	(See 04-02B-22 DTC C1288, C1440[DYNAMIC STABILITY CONTROL (DSC)].)
C1306	Steering angle sensor	(See 04-02B-18 DTC C1277, C1278, C1306, C1307[DYNAMIC STABILITY CONTROL (DSC)].)
C1307	Steering angle sensor	(See 04-02B-18 DTC C1277, C1278, C1306, C1307[DYNAMIC STABILITY CONTROL (DSC)].)
C1440	Brake fluid pressure sensor	(See 04-02B-22 DTC C1288, C1440[DYNAMIC STABILITY CONTROL (DSC)].)
C1446	Brake switch	(See 04-02B-22 DTC C1446[DYNAMIC STABILITY CONTROL (DSC)].)
C1470	TCS control system	(See 04-02B-24 DTC C1470, C1994[DYNAMIC STABILITY CONTROL (DSC)].)
C1730	Brake fluid pressure sensor power supply system	(See 04-02B-10 DTC B1342, C1267, C1730[DYNAMIC STABILITY CONTROL (DSC)].)
C1994	TCS/DSC control system	(See 04-02B-24 DTC C1470, C1994[DYNAMIC STABILITY CONTROL (DSC)].)
C2778	Combined sensor system	(See 04-02B-20 DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)].)
C2785	Combined sensor system (unperformed initialization procedure)	(See 04-02B-25 DTC C2785[DYNAMIC STABILITY CONTROL (DSC)].)
U1900	CAN line	(See 04-02B-25 DTC U1900, U2012, U2023, U2202[DYNAMIC STABILITY CONTROL (DSC)].)

DTC M-MDS	System malfunction location	Page
U1901	Combined sensor system (CAN2 line malfunction)	(See 04-02B-26 DTC U1901, U2527[DYNAMIC STABILITY CONTROL (DSC)].)
U2012	CAN line	(See 04-02B-25 DTC U1900, U2012, U2023, U2202[DYNAMIC STABILITY CONTROL (DSC)].)
U2023	CAN line	(See 04-02B-25 DTC U1900, U2012, U2023, U2202[DYNAMIC STABILITY CONTROL (DSC)].)
U2202	CAN line	(See 04-02B-25 DTC U1900, U2012, U2023, U2202[DYNAMIC STABILITY CONTROL (DSC)].)
U2527	Combined sensor system (CAN2 line malfunction)	(See 04-02B-26 DTC U1901, U2527[DYNAMIC STABILITY CONTROL (DSC)].)

PID/DATA Monitor Table

PID name (definition)	Unit/Condition	Operation condition (reference)	Action	DSC HU/CM terminal
BOO_ABS (Brake pedal switch input)	On/Off	• Brake pedal depressed: On • Brake pedal released: Off	Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.)	—
CCNTABS (Number of continuous codes)	—	• DTCs detected: **1—255** • No DTCs detected: **0**	Perform the DTC inspection. (See 04-02B-4 DTC Table.)	—
ESP_VOLT	V	• Ignition switch at ON: **Approx. 12.2 V** • Idling: **Approx. 14.1 V**	Inspect the battery.	—
LAT_ACCL	G	• Vehicle stopped or driving at constant speed: **0 G** • Cornering to right: Changes **0 G—positive** • Cornering to left: Changes **0 G—negative**	Inspect the combined sensor. (See 04-15-11 COMBINED SENSOR INSPECTION.)	—
LF_WSPD (Left front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)	I, F
LR_WSPD (Left rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)	AJ, AG
MPRETDR	Pa	• Brake pedal released: **0 Pa** • Brake pedal depressed: Changes according to the brake fluid pressure	Inspect the DSC HU/CM. (See 04-15-8 DSC HU/CM INSPECTION.)	—
RF_WSPD (Right front ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)	AP, AS
RR_WSPD (Right rear ABS wheel-speed sensor input)	KPH, MPH	• Vehicle stopped: **0 KPH, 0 MPH** • Vehicle running: vehicle speed	Inspect the ABS wheel-speed sensor. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)	O, R
SWA_POS	°	• Steering wheel in neutral position (not turned): **0°** • Steering wheel turned to left: Changes **0°—negative** • Steering wheel turned to right: Changes **0°—positive**	Inspect the steering angle sensor.	AE, AN

PID name (definition)	Unit/Condition	Operation condition (reference)	Action	DSC HU/CM terminal
TCYC_FS	On/Off	• Solenoid valve activated: On • Solenoid valve not activated: Off	Inspect the DSC HU/CM. (See 04-15-3 DSC SYSTEM INSPECTION.)	—
TCYC_SW	Depressed/ Not_Depressed	• DSC OFF switch depressed: Depressed • DSC OFF switch not depressed: Not_Depressed	Inspect the DSC OFF switch. (See 04-15-14 DSC OFF SWITCH INSPECTION.)	AD
YAW_RATE	°/s	• Vehicle stopped or driving straight: **0 °/s** • Cornering to left: Changes **0 °/s—negative** • Cornering to right: Changes **0 °/s—positive**	Inspect the combined sensor. (See 04-15-11 COMBINED SENSOR INSPECTION.)	—

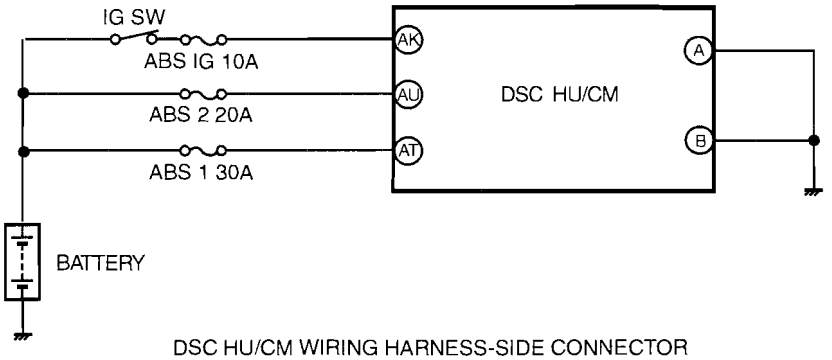
Active Command Modes Table

Command name	Output part	Operation	Operating condition
PMP_MOTOR	Pump motor	On/Off	Ignition switch at ON
RF_OUTLET	RF outlet solenoid valve		
RF_INLET	RF inlet solenoid valve		
LF_OUTLET	LF outlet solenoid valve		
LF_INLET	LF inlet solenoid valve		
RR_OUTLET	RR outlet solenoid valve		
RR_INLET	RR inlet solenoid valve		
LR_OUTLET	LR outlet solenoid valve		
LR_INLET	LR inlet solenoid valve		
LF_TC_PRV	LF stability control solenoid valve		
RF_TC_PRV	RF stability control solenoid valve		
LF_TC_SWV	LF traction control solenoid valve		
RF_TC_SWV	RF traction control solenoid valve		
MCYL_S_CAL	Brake fluid pressure sensor initialization start-up	True/False	
LATACCEL	Combined sensor (lateral acceleration) initialization start-up		

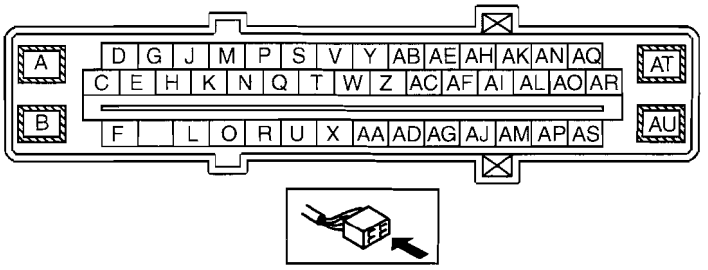
DTC B1317, B1318[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2800300

DTC B1317, B1318	Power supply system
DETECTION CONDITION	• B1317 — High ignition voltage (**16 V or more**) is detected at the voltage monitor of the solenoid valve or motor monitor. • B1318 — When driving the vehicle at **20 km/h {12.4 mph} or more**, low ignition voltage (**10 V or less**) is detected at the voltage monitor of the solenoid valve or motor monitor.
POSSIBLE CAUSE	• ABS 1 30A/ABS 2 20A/ABS IG 10A fuse malfunction • Open or short circuit in the wiring harness between DSC HU/CM terminal AK and battery • Open or short circuit in the wiring harness between DSC HU/CM terminal AU and battery • Open or short circuit in the wiring harness between DSC HU/CM terminal AT and battery • Open circuit in the wiring harness between DSC HU/CM terminal A and body ground • Open circuit in the wiring harness between DSC HU/CM terminal B and body ground • Battery deterioration • Generator malfunction • Poor connection at connectors (female terminal)



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



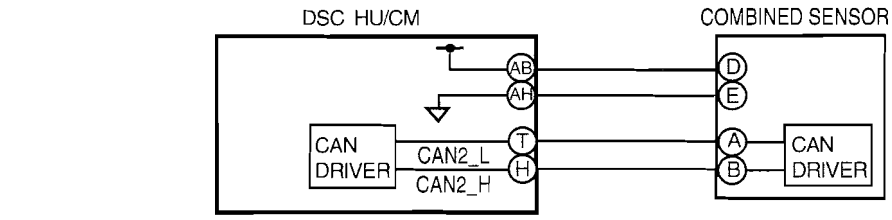
Diagnostic procedure

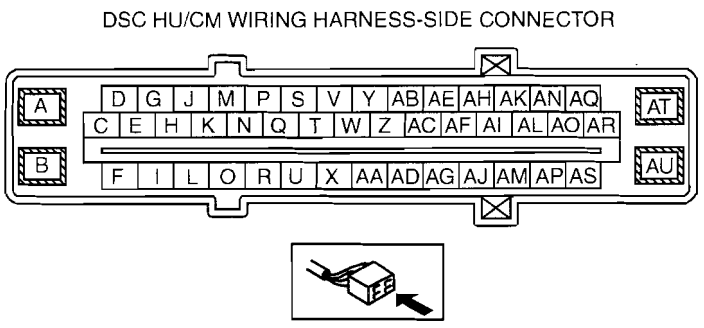
STEP	INSPECTION		ACTION
1	**INSPECT BATTERY VOLTAGE** • Is the battery terminal voltage normal?	Yes	Verify that the battery terminal connection is normal. Go to the next step.
		No	Recharge or replace the battery, then go to Step 6. (See 01-17A-6 BATTERY RECHARGING[LF, L3].) (See 01-17B-5 BATTERY RECHARGING[L3 WITH TC].) (See 01-17A-2 BATTERY REMOVAL/ INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/ INSTALLATION[L3 WITH TC].)
2	**INSPECT BATTERY GRAVITY** • Is the battery specific gravity as specified?	Yes	Go to the next step.
		No	Replace the battery, then go to Step 6. (See 01-17A-2 BATTERY REMOVAL/ INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/ INSTALLATION[L3 WITH TC].)
3	**INSPECT CHARGING SYSTEM** • Are the generator and the drive belt tensions normal?	Yes	Go to the next step.
		No	Replace the generator and/or drive belt if necessary. (See 01-17A-6 GENERATOR REMOVAL/ INSTALLATION[LF, L3].) (See 01-17B-6 GENERATOR REMOVAL/ INSTALLATION[L3 WITH TC].) (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].) (See 01-10B-3 DRIVE BELT REMOVAL/ INSTALLATION[L3 WITH TC].) Go to Step 6.
4	**INSPECT DSC HU/CM POWER SUPPLY FOR OPEN CIRCUIT** • Disconnect the DSC HU/CM connectors. • Turn the ignition switch to the ON position. • Measure the voltage between following connector terminals of the DSC HU/CM (vehicle harness-side) and body ground: — DSC HU/CM: AK—Body ground — DSC HU/CM: AU—Body ground — DSC HU/CM: AT—Body ground • Is the voltage **10 V or more**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
5	**INSPECT DSC HU/CM GROUND FOR POOR GROUND OR OPEN CIRCUIT** • Turn the ignition switch off. • Measure the resistance between following connector terminals of the DSC HU/CM (vehicle harness-side) and body ground: — DSC HU/CM: A—Body ground — DSC HU/CM: B—Body ground • Is the resistance **within 0—1 ohm**?	Yes	Go to the next step.
		No	If there is open circuit: • Repair or replace the wiring harness, then go to the next step. If resistance is not within specification: • Repair or replace the wiring harness for poor ground, then go to the next step.
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **20 km/h {12.4 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

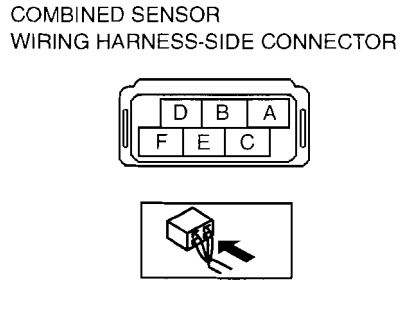
DTC B2741[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2803900

DTC B2741	Combined sensor (internal malfunction)
DETECTION CONDITION	• Combined sensor internal malfunction is detected.
POSSIBLE CAUSE	• Combined sensor internal malfunction







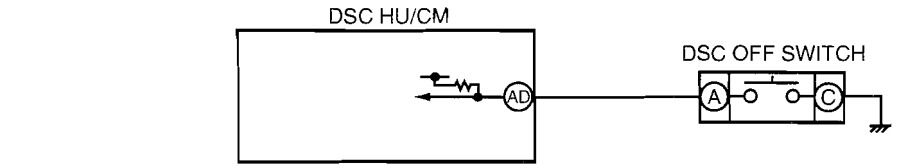
Diagnostic procedure

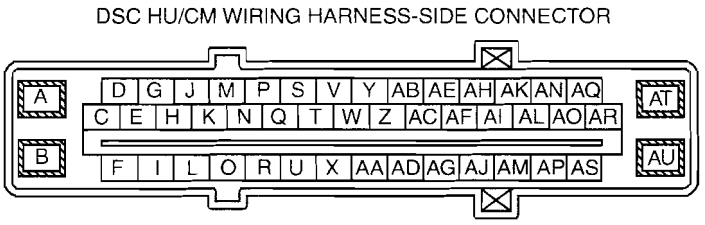
STEP	INSPECTION		ACTION
1	**VERIFY COMBINED SENSOR MALFUNCTION** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Replace the combined sensor, then go to the next step. (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)
		No	Go to the next step.
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

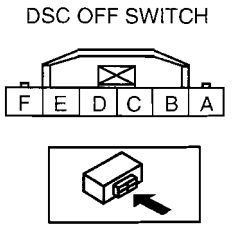
DTC C1093[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2800700

DTC C1093	DSC OFF switch
DETECTION CONDITION	• Continuous ON signal from the DSC OFF switch for **10 s or more** is detected.
POSSIBLE CAUSE	• The driver pressed and held the DSC OFF switch for **10 s or more**. • Short to ground in the wiring harness between DSC OFF switch and DSC HU/CM terminal AD • DSC OFF switch malfunction • Poor connection at connectors (female terminal)







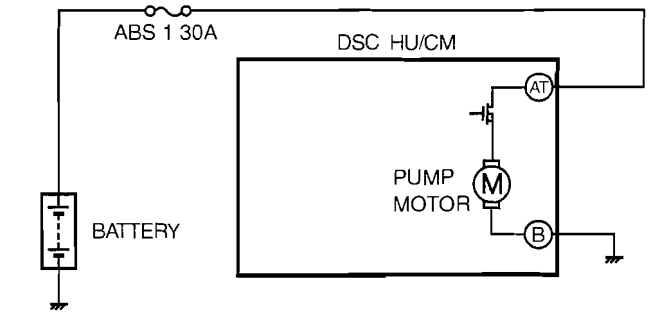
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DSC OFF SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the DSC HU/CM connector. • Inspect for continuity between DSC HU/CM connector (vehicle harness-side) terminal AD and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 3.
		No	Go to the next step.
2	**INSPECT DSC OFF SWITCH** • Inspect the DSC OFF switch. (See 04-15-14 DSC OFF SWITCH INSPECTION.) • Is the DSC OFF switch normal?	Yes	Go to the next step.
		No	Replace the DSC OFF switch, then go to the next step. (See 04-15-14 DSC OFF SWITCH REMOVAL/ INSTALLATION.)
3	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
4	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

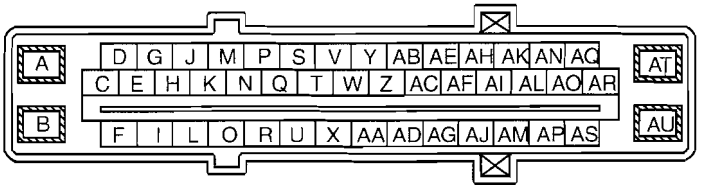
DTC C1095[DYNAMIC STABILITY CONTROL (DSC)]

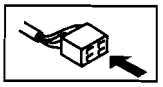
id0402b2806800

DTC C1095	Pump motor, motor relay
DETECTION CONDITION	• DSC motor monitor signal does not correspond to DSC HU/CM OFF signal. • DSC motor monitor signal does not correspond to DSC HU/CM ON signal. • DSC motor monitor ON signal is not input within specified time limit when motor signal is switched from ON to OFF by DSC HU/CM.
POSSIBLE CAUSE	• ABS 1 30A fuse malfunction • Open circuit or short to ground in the wiring harness between DSC HU/CM terminal AT and battery • Open circuit in the wiring harness between DSC HU/CM terminal B and body ground • Open or short circuit in the DSC HU/CM internal motor relay, or stuck motor relay • Open or short circuit in the DSC HU/CM internal pump motor, or frozen pump motor • Poor connection at connectors (female terminal)



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR





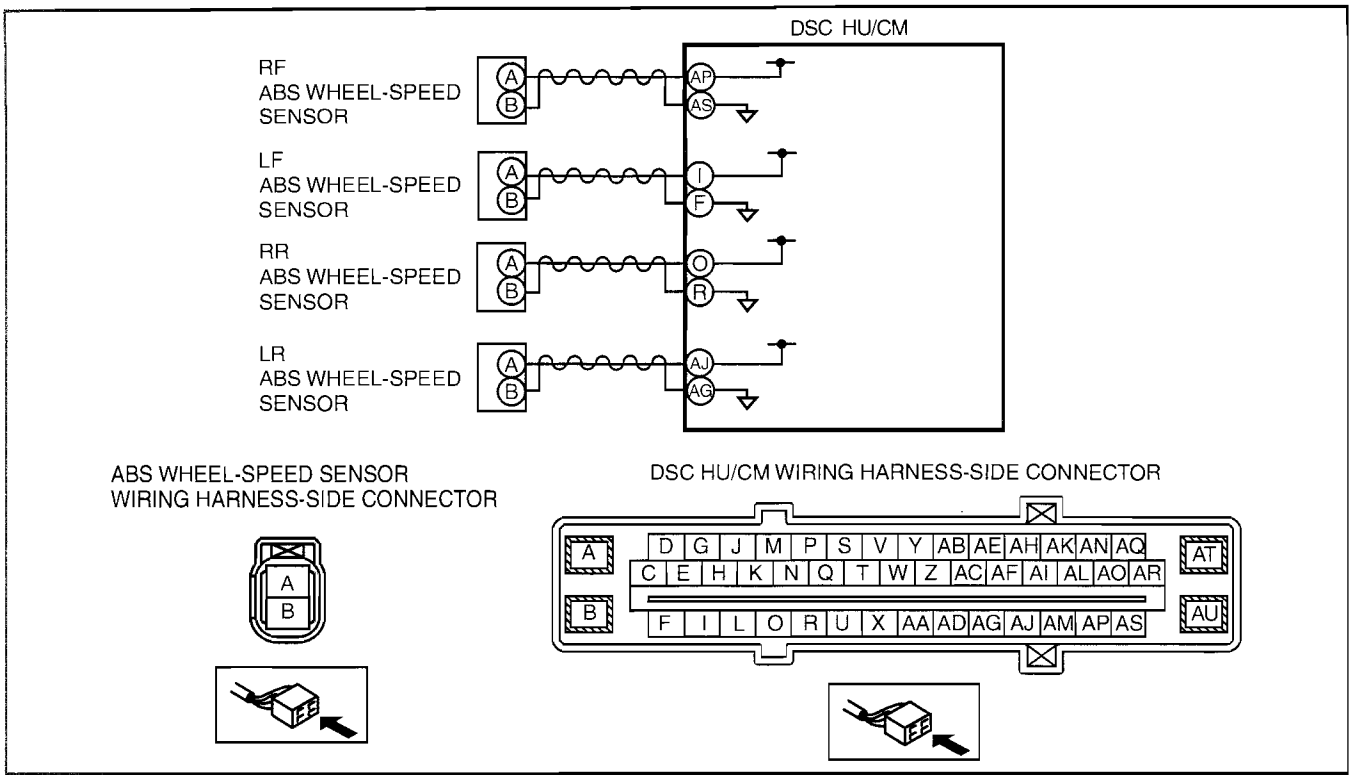
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT ABS FUSE CONDITION** • Is the ABS fuse (ABS 1 30A) normal?	Yes	Go to the next step.
		No	Replace the ABS fuse, then go to Step 6.
2	**VERIFY PUMP MOTOR OPERATION** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Turn the ignition switch to the ON position. • Access PMP_MOTOR active command modes using the M-MDS. • Does the pump motor operate?	Yes	Go to the next step.
		No	Replace the DSC HU/CM, then go to Step 6. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
3	**INSPECT MOTOR RELAY POWER SUPPLY FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect the DSC HU/CM connectors. • Inspect for continuity between the DSC HU/CM terminal AT and the battery positive terminal. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
4	**INSPECT MOTOR RELAY POWER SUPPLY FOR SHORT CIRCUIT** • Inspect for continuity between the DSC HU/CM terminal AT and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 6.
		No	Go to the next step.
5	**INSPECT PUMP MOTOR GROUND FOR OPEN CIRCUIT** • Inspect for continuity between the DSC HU/CM terminal B and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2806400

DTC	C1141, C1142, C1143, C1144, C1233, C1234, C1235, C1236	ABS wheel-speed sensor/ABS sensor rotor
DETECTION CONDITION	• C1141, C1142, C1143, C1144 — Periodic abnormality is detected in the signal wave pattern from the ABS wheel-speed sensors. • C1234, C1233, C1235, C1236 — Wheel-speed signal is not input or extremely low wheel-speed signal is input from any of the four wheels when driving at a vehicle speed of **10 km/h {6.2 mph} or more**. — A large, sudden change in wheel-speed signal is detected. — ABS control operates for **28 s or more**.	
POSSIBLE CAUSE	• ABS wheel-speed sensor malfunction • ABS sensor rotor malfunction (foreign material adhering) • Improper installation of ABS wheel-speed sensor and/or sensor rotor • Excessive clearance between the ABS wheel-speed sensor and sensor rotor • Continuous ABS operation	



04-02B

Diagnostic procedure

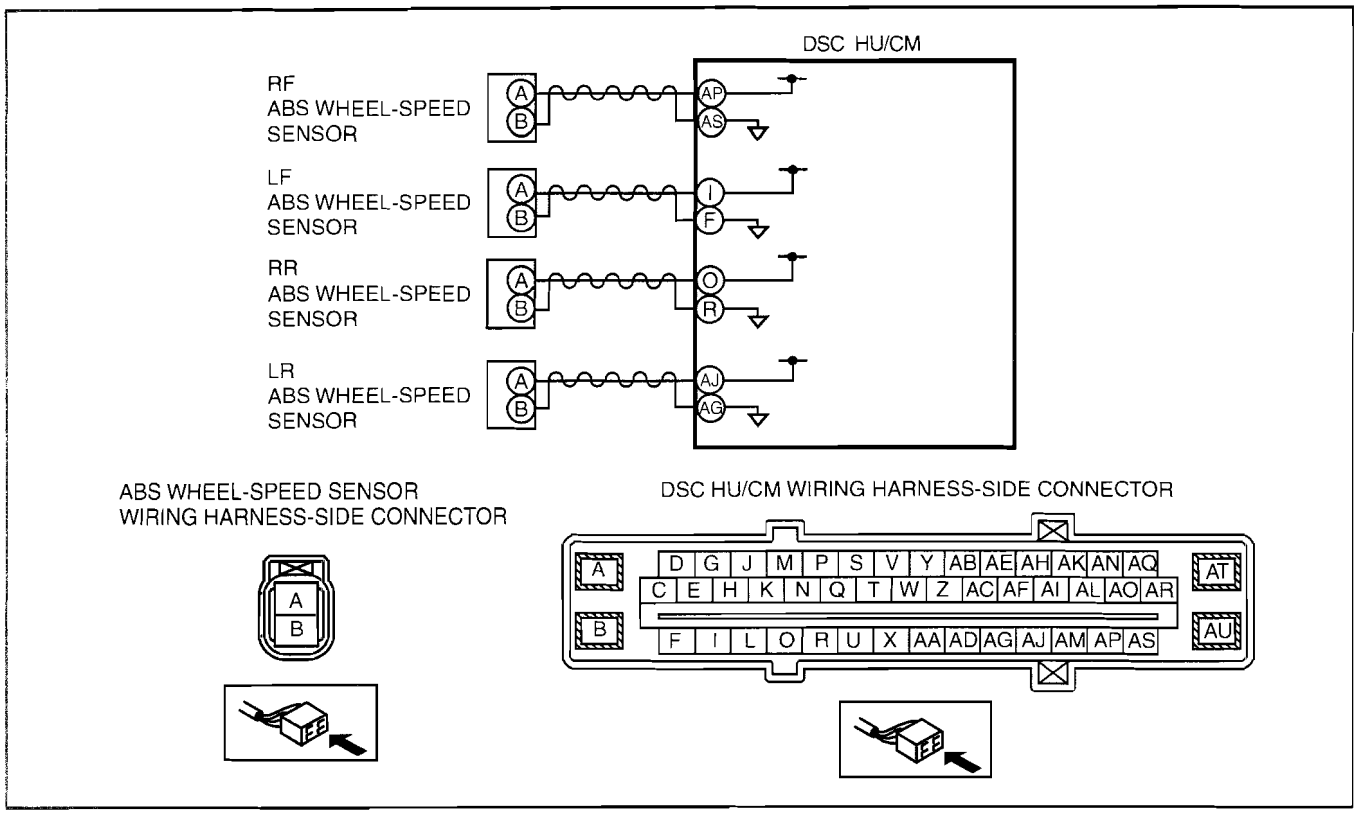
STEP	INSPECTION		ACTION
1	**INSPECT PID FOR ABS WHEEL-SPEED SENSOR OUTPUT ERROR USING M-MDS** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Select the following PIDs using the M-MDS: LF_WSPD LR_WSPD RF_WSPD RR_WSPD • Drive the vehicle. • Verify that the vehicle speeds detected by the four ABS wheel-speed sensors are approximately the same. • Are the vehicle speeds approximately the same?	Yes	Go to Step 3.
		No	Go to the next step.
2	**INSPECT ABS WHEEL-SPEED SENSOR CONNECTOR FOR SHORT TO GROUND** • Disconnect the ABS wheel-speed sensor connectors. • Verify that there is no continuity between the following ABS wheel-speed sensor terminals (vehicle harness-side) and body ground. — ABS wheel-speed sensor (RF): B—Body ground — ABS wheel-speed sensor (LF): B—Body ground — ABS wheel-speed sensor (RR): B—Body ground — ABS wheel-speed sensor (LR): B—Body ground • Is the continuity normal?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.

STEP	INSPECTION		ACTION
3	**INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE.** • Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.) • Is the clearance normal? **Clearance** **Front: 2.1 mm {0.082 in} or less** **Rear: 1.46 mm {0.057 in} or less**	Yes	Go to the next step.
		No	Replace the ABS wheel-speed sensor, then go to Step 6. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
4	**VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION** • Is the result normal?	Yes	Go to Step 6.
		No	Replace the wheel hub component, then go to Step 6. (See 03-11-3 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.) (See 03-12-3 WHEEL HUB COMPONENT REMOVAL/INSTALLATION.)
5	**INSPECT IF MALFUNCTION OCCURRED DUE TO INTERNAL MALFUNCTION OF HYDRAULIC UNIT (CLOGGING IN PIPING)** • Perform the DSC system operation inspection. (See 04-15-3 DSC SYSTEM INSPECTION.) • Is the system normal?	Yes	Go to the next step.
		No	Replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

DTC C1145, C1155, C1165, C1175[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2801100

DTC C1145, C1155, C1165, C1175	ABS wheel-speed sensor
DETECTION CONDITION	• Open circuit or short to ground has been detected in the ABS wheel-speed sensor wiring harness on any of the four vehicle wheels.
POSSIBLE CAUSE	• Open circuit or short to ground in the wiring harness between the following DSC HU/CM terminals and the ABS wheel-speed sensor terminals: — DSC HU/CM terminal AP—RF ABS wheel-speed sensor terminal A — DSC HU/CM terminal AS—RF ABS wheel-speed sensor terminal B — DSC HU/CM terminal I—LF ABS wheel-speed sensor terminal A — DSC HU/CM terminal F—LF ABS wheel-speed sensor terminal B — DSC HU/CM terminal O—RR ABS wheel-speed sensor terminal A — DSC HU/CM terminal R—RR ABS wheel-speed sensor terminal B — DSC HU/CM terminal AJ—LR ABS wheel-speed sensor terminal A — DSC HU/CM terminal AG—LR ABS wheel-speed sensor terminal B • ABS wheel-speed sensor malfunction • Poor connection at connectors (female terminal)



04-02B

Diagnostic procedure

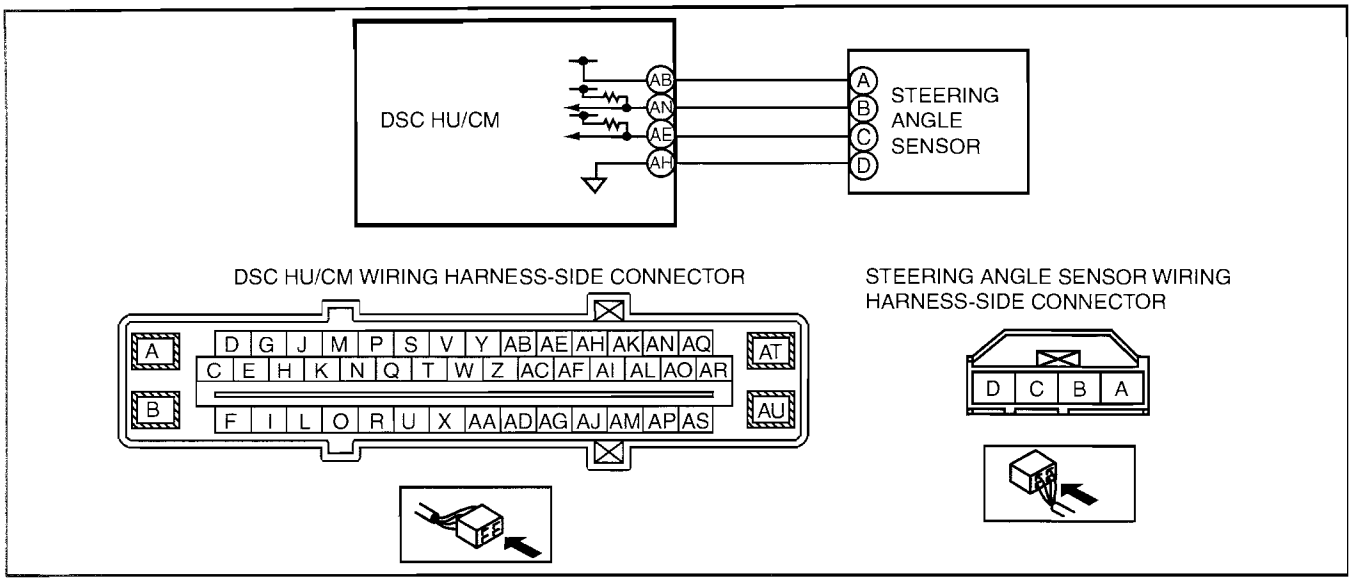
STEP	INSPECTION		ACTION
1	**INSPECT ABS WHEEL-SPEED SENSOR FOR SHORT TO GROUND** • Turn the ignition switch off. • Disconnect the DSC HU/CM connectors. • Inspect for continuity between the following DSC HU/CM connector terminals (vehicle harness-side) and body ground: — RF ABS wheel-speed sensor(+): AP — RF ABS wheel-speed sensor(-): AS — LF ABS wheel-speed sensor(+): I — LF ABS wheel-speed sensor(-): F — RR ABS wheel-speed sensor(+): O — RR ABS wheel-speed sensor(-): R — LR ABS wheel-speed sensor(+): AJ — LR ABS wheel-speed sensor(-): AG • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 3.
2	**INSPECT ABS WHEEL-SPEED SENSOR WIRING HARNESS FOR SHORT TO GROUND** • Disconnect the ABS wheel-speed sensor connectors. • Inspect for continuity between the following DSC HU/CM connector terminals (vehicle harness-side) and body ground: — RF ABS wheel-speed sensor(+): AP — RF ABS wheel-speed sensor(-): AS — LF ABS wheel-speed sensor(+): I — LF ABS wheel-speed sensor(-): F — RR ABS wheel-speed sensor(+): O — RR ABS wheel-speed sensor(-): R — LR ABS wheel-speed sensor(+): AJ — LR ABS wheel-speed sensor(-): AG • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 4.
		No	Replace the ABS wheel-speed sensor, then go to Step 4. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
3	**INSPECT ABS WHEEL-SPEED SENSOR WIRING HARNESS FOR OPEN CIRCUIT** • Inspect for continuity between the DSC HU/CM connectors (vehicle harness-side) and the following vehicle harness-side terminals of ABS wheel-speed sensors: — RF ABS wheel-speed sensor(+): AP—A — RF ABS wheel-speed sensor(-): AS—B — LF ABS wheel-speed sensor(+): I—A — LF ABS wheel-speed sensor(-): F—B — RR ABS wheel-speed sensor(+): O—A — RR ABS wheel-speed sensor(-): R—B — LR ABS wheel-speed sensor(+): AJ—A — LR ABS wheel-speed sensor(-): AG—B • Is there continuity?	Yes	Go to the next step.
		No	Replace the ABS wheel-speed sensor, then go to the next step. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)
4	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C1277, C1278, C1306, C1307[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2808000

DTC C1277, C1278, C1306, C1307	Steering angle sensor
DETECTION CONDITION	• C 1277 — Output voltage from either steering angle sensors 1 or 2 is **4.75 V or more** or **0.25 V or less**. • C 1278 — The steering angle sensor detects signal modulation or steering angle that exceeds specification. • C 1306 — The neutral position of the steering angle cannot be estimated from the signals from the ABS wheel-speed sensors and the combined sensor. • C 1307 — The signal from the steering angle sensor remains unchanged when the steering angle is turned to the right and left.
POSSIBLE CAUSE	• Improper installation or positioning of the steering angle sensor • Open circuit in the wiring harness between DSC HU/CM terminal AB and steering angle sensor terminal A • Open circuit in the wiring harness between DSC HU/CM terminal AE and steering angle sensor terminal C, short to battery or to ground • Open circuit in the wiring harness between DSC HU/CM terminal AN and steering angle sensor terminal B, short to battery or to ground • Open circuit in the wiring harness between DSC HU/CM terminal AH and steering angle sensor terminal D • Signal error from the ABS wheel-speed sensor • Signal error from the combined sensor • Signal errors from sensors due to rough road driving • Steering angle sensor malfunction • Poor connection at connectors (female terminal)



Diagnostic procedure

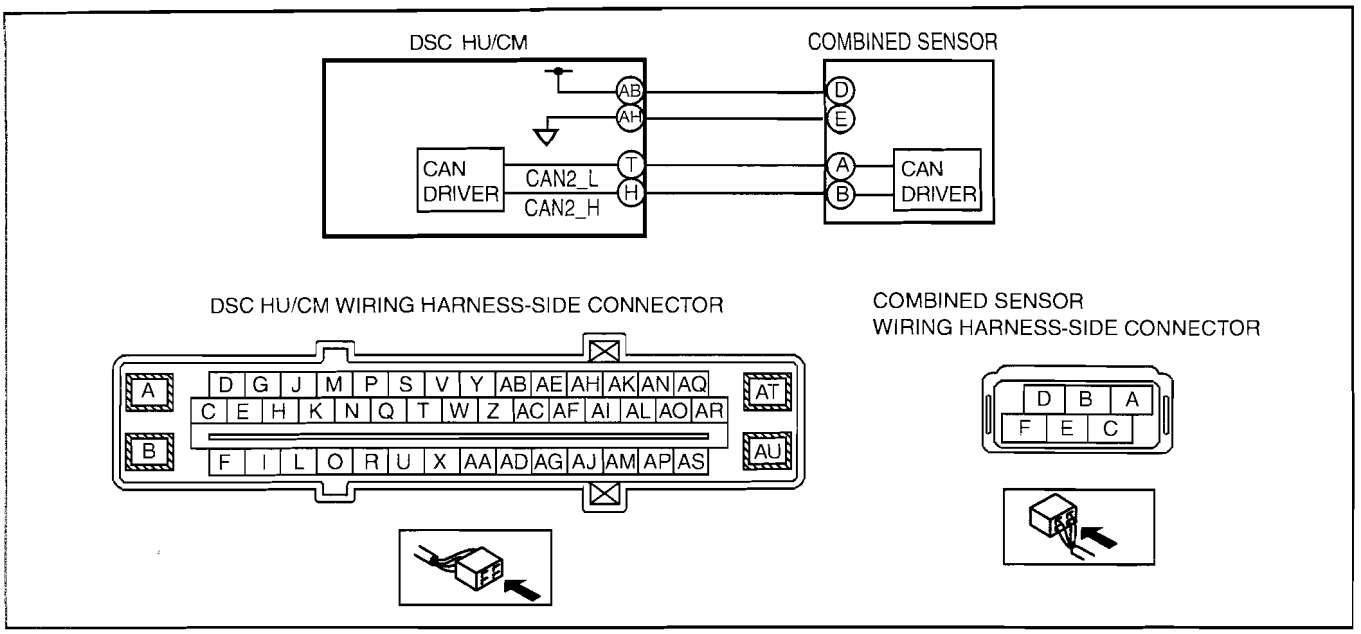
STEP	INSPECTION		ACTION
1	**INSPECT STEERING ANGLE SENSOR POWER SUPPLY FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position. • Measure the voltage between the steering angle sensor terminal A and body ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 8.
2	**INSPECT STEERING ANGLE SENSOR GROUND FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the steering angle sensor terminal D and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 8.
3	**INSPECT STEERING ANGLE SENSOR SIGNAL FOR OPEN CIRCUIT** • Disconnect the DSC HU/CM connectors. • Inspect for continuity between the DSC HU/CM connectors (vehicle harness-side) and the following steering angle sensor connector terminals: — Steering angle sensor (Sensor 1 system): AN—B — Steering angle sensor (Sensor 2 system): AE—C • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 8.
4	**INSPECT STEERING ANGLE SENSOR SIGNAL FOR SHORT TO GROUND** • Disconnect the steering angle sensor connectors • Inspect for continuity between the following steering angle sensor connector terminals (vehicle harness-side) and body ground: — Steering angle sensor (Sensor 1 system): B—Body ground — Steering angle sensor (Sensor 2 system): C—Body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	**INSPECT STEERING ANGLE SENSOR SIGNAL FOR SHORT TO POWER SUPPLY CIRCUIT** • Measure voltage between the following steering angle sensor connector terminals (vehicle harness-side) and body ground: — Steering angle sensor (Sensor 1 system): B—Body ground — Steering angle sensor (Sensor 2 system): C—Body ground • Is the voltage **1 V or less**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 8.

STEP	INSPECTION		ACTION
6	**INSPECT FOR IMPROPER INSTALLATION OF STEERING ANGLE SENSOR** • Is the installation normal?	Yes	Go to the next step.
		No	Repair installation or replace the steering angle sensor, then go to Step 8. (See 08-10-14 CLOCK SPRING REMOVAL/ INSTALLATION.)
7	**INSPECT STEERING ANGLE SENSOR** • Reconnect all disconnected connectors. • Inspect the steering angle sensor. (See 04-15-13 STEERING ANGLE SENSOR INSPECTION.) • Is the steering angle sensor normal?	Yes	Go to the next step.
		No	Replace the steering angle sensor, then go to the next step. (See 08-10-14 CLOCK SPRING REMOVAL/ INSTALLATION.)
8	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
9	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C1279, C1280, C1281, C1282, C2778[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2804100

DTC C1279, C1280, C1281, C1282, C2778	Combined sensor system
DETECTION CONDITION	• C1279, C1280 — Out-of-specification signal modulation or yaw rate value is detected from the combined sensor (yaw rate part). • C1281, C1282 — Out-of-specification signal modulation or lateral-G value is detected from the combined sensor (lateral-G part). • C2778 — An error is detected for the voltage to the combined sensor.
POSSIBLE CAUSE	• Open or short circuit in the wiring harness between DSC HU/CM terminal AB and combined sensor terminal D • Open or short circuit in the wiring harness between DSC HU/CM terminal AH and combined sensor terminal E • Open circuit in the wiring harness between DSC HU/CM terminal T and combined sensor terminal A (CAN2 line) • Open circuit in the wiring harness between DSC HU/CM terminal H and combined sensor terminal B (CAN2 line) • Combined sensor malfunction • Poor connection at connectors (female terminal)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COMBINED SENSOR POWER SUPPLY FOR OPEN CIRCUIT** • Turn the ignition switch to the ON position. • Measure the voltage between the combined sensor terminal D and body ground. • Is the voltage **approx. 12 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 4.
2	**INSPECT COMBINED SENSOR GROUND FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between the combined sensor terminal E and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 4.
3	**INSPECT COMBINED SENSOR** • Inspect the combined sensor. (See 04-15-11 COMBINED SENSOR INSPECTION.) • Is the combined sensor normal?	Yes	Go to the next step.
		No	Replace the combined sensor, then go to the next step. (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)
4	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C1288, C1440[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2804200

DTC C1288, C1440	Brake fluid pressure sensor
DETECTION CONDITION	• C1288 — The voltage value from the brake fluid pressure sensor is not within specification. • C1440 — The value output from the brake fluid pressure sensor when braking does not change. — The pressure value from the brake fluid pressure sensor is not within specification when decelerating. — The pressure value from the brake fluid pressure sensor when not braking exceeds specification.
POSSIBLE CAUSE	• Brake fluid pressure sensor malfunction • Open or short circuit in the brake fluid pressure sensor circuit in DSC HU/CM

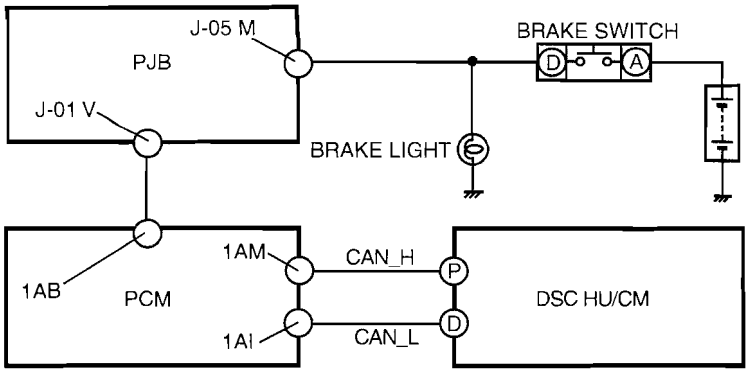
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY NO ABNORMALITY ON BRAKE FLUID PRESSURE SENSOR** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **10 km/h {6.2 mph} or more**. • Are the same DTCs present?	Yes	Replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

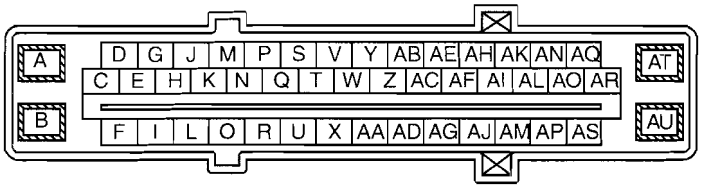
DTC C1446[DYNAMIC STABILITY CONTROL (DSC)]

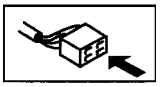
id0402b2803400

DTC C1446	Brake switch
DETECTION CONDITION	• Brake switch ON signal is input for **6 min or more** when driving at a vehicle speed of **20 km/h {12.4 mph} or more**. • Brake switch ON signal is not input even though the DSC HU/CM determines vehicle deceleration.
POSSIBLE CAUSE	• Open or short circuit in the wiring harness between brake switch and the terminal on the PJB • Open or short circuit in the wiring harness between the terminals on the PJB and PCM • Brake switch malfunction • Poor connection at connectors (female terminal)

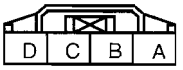


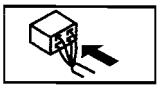
DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



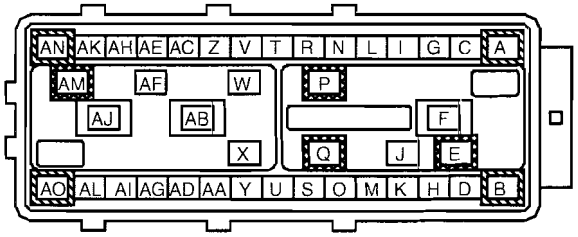


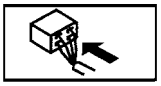
BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



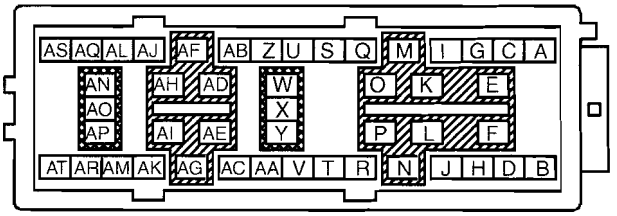


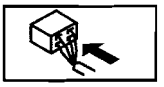
PJB J-01 WIRING HARNESS-SIDE CONNECTOR





PJB J-05 WIRING HARNESS-SIDE CONNECTOR

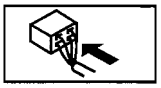




PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OPEN OR SHORT CIRCUIT IN BRAKE SWITCH SIGNAL** • Turn the ignition switch to the ON position. • Measure the voltage between the PCM terminal 1AB and body ground when the brake pedal is depressed and released: **Voltage** **Brake pedal depressed: B+** **Brake pedal released:** **1 V or less**	Yes	Go to Step 5.
		No	If it is **B+** under any condition, then go to the next step. If it is **1 V or less** under any condition, then go to Step 3.
2	**INSPECT BRAKE SWITCH SIGNAL FOR SHORT TO POWER SUPPLY CIRCUIT** • Disconnect the brake switch connector. • Measure the voltage between the brake switch connector terminal D (vehicle harness-side) and body ground. • Is the voltage **1 V or less**?	Yes	Go to Step 4.
		No	Repair or replace the wiring harness between the PCM and brake switch, then go to Step 5.
3	**INSPECT BRAKE SWITCH SIGNAL FOR OPEN CIRCUIT** • Disconnect the PCM connectors. • Disconnect the brake switch connector. • Inspect continuity between the PCM connector terminal 1AB (vehicle harness-side) and brake switch terminal D: • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the PCM and brake switch, then go to Step 5.
4	**INSPECT BRAKE SWITCH** • Inspect the brake switch. (See 04-11-8 BRAKE SWITCH INSPECTION.) • Is the brake switch normal?	Yes	Go to the next step.
		No	Replace the brake switch, then go to the next step. (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
5	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Start the engine and drive the vehicle at **20 km/h {12.4 mph} or more**. • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
6	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C1470, C1994[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2804300

DTC C1470, C1994	TCS/DSC control system
DETECTION CONDITION	• C1470 — Due to excessive braking, TCS control using braking is temporarily inhibited. • C1994 — DSC control continues for a specified period of time or more
POSSIBLE CAUSE	• This does not indicate a malfunction since constant TCS or DSC control over an extended period of time is inhibited to protect the DSC solenoid valve inside the DSC HU or the engine.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC C2785[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2804400

DTC C2785	Combined sensor system (unperformed initialization procedure)
DETECTION CONDITION	• DSC detects that the initialization procedure for combined sensor has not been performed.
POSSIBLE CAUSE	• Initialization procedure for the combined sensor not performed • Combined sensor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY OTHER DTC HAS BEEN RECORDED** • Has DTC B2141 also been stored?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**VERIFY INITIALIZATION PROCEDURE** • Was the combined sensor initialization procedure performed?	Yes	Go to the next step.
		No	Perform the combined sensor initialization procedure, then go to the next step. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.)
3	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
4	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

DTC U1900, U2012, U2023, U2202[DYNAMIC STABILITY CONTROL (DSC)]

id0402b2808100

DTC U1900, U2012, U2202	CAN line
DETECTION CONDITION	• U1900, U2202 — Communication error with PCM is detected in CAN communication. • U2012 — CAN system wiring harness open or short circuit is detected.
POSSIBLE CAUSE	• Incorrect vehicle data (suspension and brake specs.) input during PCM configuration • CAN system wiring harness open or short circuit with PCM • PCM malfunction

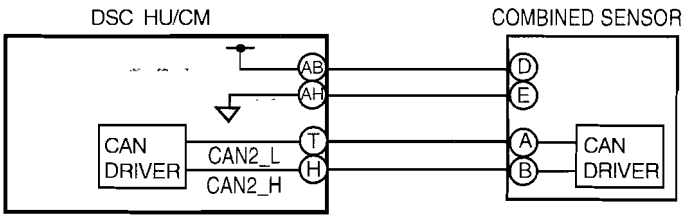
Diagnostic procedure

- Inspect according to the diagnostic procedure in BODY & ACCESSORIES. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)

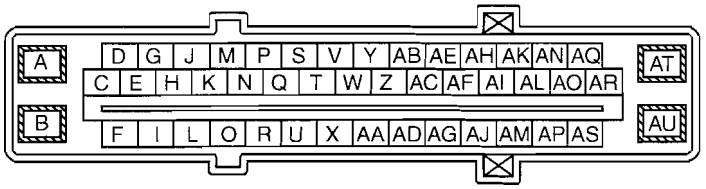
DTC U1901, U2527[DYNAMIC STABILITY CONTROL (DSC)]

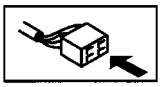
id0402b2804600

DTC U1901, U2527	Combined sensor system (CAN2 line malfunction)
DETECTION CONDITION	• U1901 — The signal from the combined sensor is not within specification. • U2527 — Open or short circuit in CAN system wiring harness is detected.
POSSIBLE CAUSE	• Open or short circuit in the CAN2_L wiring harness between combined sensor terminal A and DSC HU/CM terminal T • Open or short circuit in the CAN2_H wiring harness between combined sensor terminal B and DSC HU/CM terminal H • Combined sensor malfunction • DSC HU/CM malfunction • Poor connection at connectors (female terminal)

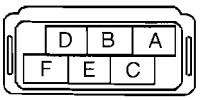


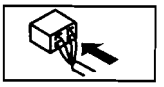
DSC HU/CM WIRING HARNESS-SIDE CONNECTOR





COMBINED SENSOR WIRING HARNESS-SIDE CONNECTOR





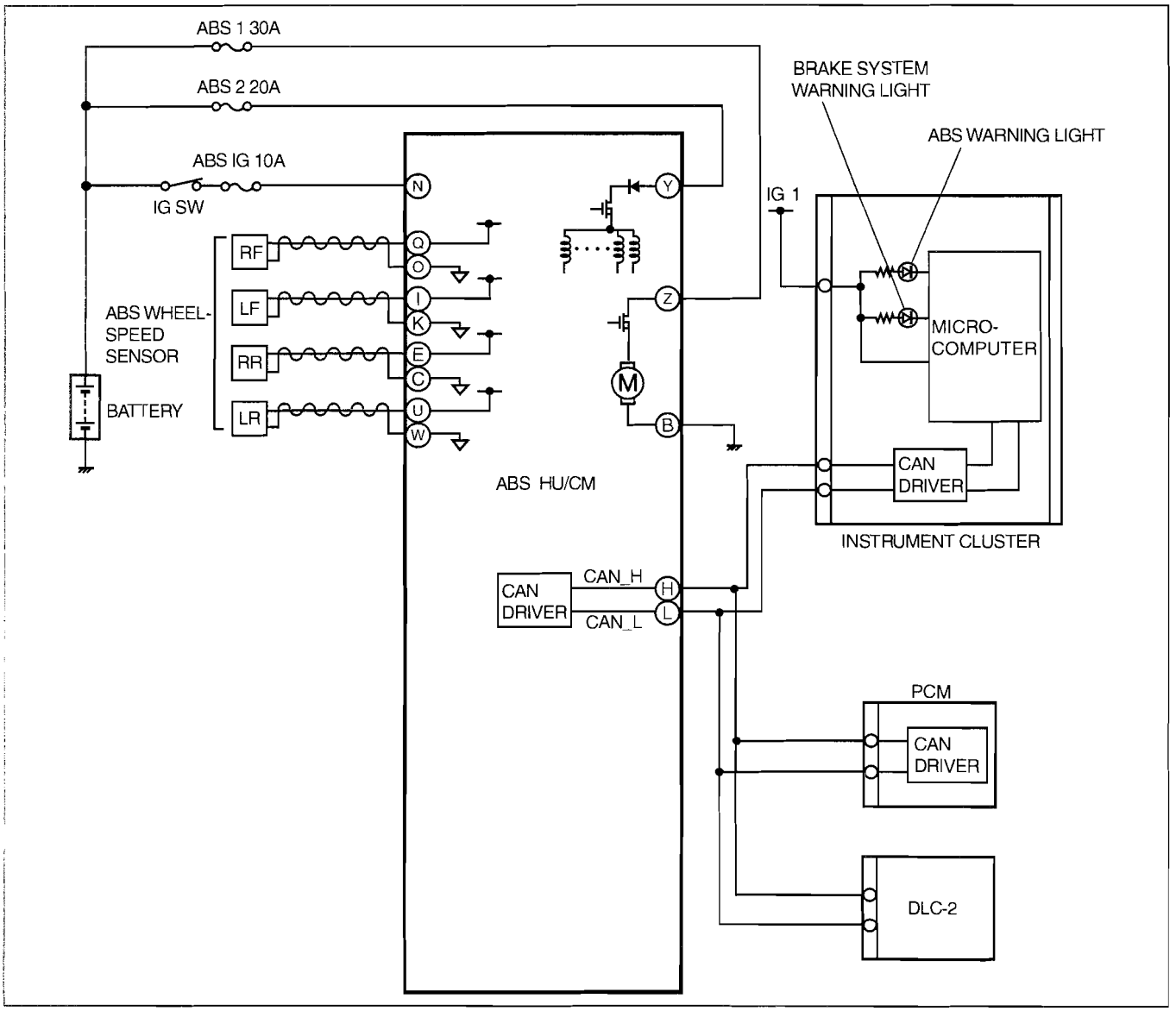
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COMBINED SENSOR SIGNAL (CAN2 LINE) FOR OPEN CIRCUIT** • Disconnect the DSC HU/CM connectors. • Disconnect the combined sensor connectors. • Inspect for continuity between the DSC HU/CM connectors (vehicle harness-side) and the following combined sensor connector terminals (vehicle harness-side): — Combined sensor (CAN2_L): T—A — Combined sensor (CAN2_H): H—B • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 4.
2	**INSPECT COMBINED SENSOR SIGNAL (CAN2 LINE) FOR SHORT CIRCUIT** • Inspect for continuity between the following DSC HU/CM connector terminals (vehicle harness-side) and body ground: — Combined sensor (CAN2_L): T — Combined sensor (CAN2_H): H • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 4.
		No	Go to the next step.
3	**INSPECT THE COMBINED SENSOR** • Reconnect all disconnected connectors. Inspect the combined sensor. (See 04-15-11 COMBINED SENSOR INSPECTION.) • Is the combined sensor normal?	Yes	Go to the next step.
		No	Replace the combined sensor, then go to the next step. (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)
4	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].) • Are the same DTCs present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	DTC troubleshooting completed.

04-03A SYMPTOM TROUBLESHOOTING [ABS]

SYSTEM WIRING DIAGRAM[ABS]

id0403a5806400



am3zzw0000240

FOREWORD[ABS]

id0403a5804000

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic inspection. To inspect the DTC, follow the DTC Inspection steps. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)

PRECAUTION[ABS]

id0403a5804100

1. Any one or a combination of the ABS warning and BRAKE system warning lights illuminates even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD control
Either or both of the following lights illuminate: • ABS warning light • BRAKE system warning light(*1)	When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun.	After turning ignition switch off, vehicle is driven at speed **greater than 10 km/h {6.2 mph}** and normal operation is confirmed.	• ABS: Cuts control. • EBD: 1. Cuts control, in cases where the light may illuminate, only when ABS CM detects that a wheel speed sensor determines that more than two wheels are malfunctioning. 2. Operates control, if wheel speed sensor determines that more than three wheels are functioning correctly.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/ deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
Both of the following lights illuminate: • ABS warning light • BRAKE system warning light	Battery voltage at ABS HU/CM ignition terminal AK drops **below approx. 8 V.**(*2)	Battery voltage rises **above approx. 8 V.**	ABS: Cuts control. EBD: Cuts control.

*1 : In cases where the light may illuminate, only when ABS HU/CM detects that a wheel-speed sensor determines that more than two wheels are malfunctioning.
*2 : If battery voltage drops **below 8 V** while vehicle speed is **greater than 20 km/h {12.4 mph}**, ABS HU/CM records DTC B1318.

2. Precautions during servicing of ABS
The ABS is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.
(1) Malfunctions in electrical system
- The ABS hydraulic unit and control module (ABS HU/CM) has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light will illuminate when there is a problem in the electrical system. Also, past and present malfunctions are recorded in the ABS HU/CM. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC-2. The stored malfunctions will be displayed in the order of occurrence. To find out the causes of ABS malfunctions, use these on-board diagnostic results.
- If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness. The ABS HU/CM usually operates normally. Be careful when searching for the cause of malfunction.
- After repair, it is necessary to clear the DTC from the ABS HU/CM memory. Also, if the ABS related parts have been replaced, verify that the no DTC has been displayed after repairs.
- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the ABS CM (ABS motor or ABS motor relay or solenoid valve), the ABS warning light may not go out (*) even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **10 km/h {6.2 mph} or more**, make sure that ABS warning light goes out, and then clear the DTC.
  * The BRAKE system warning light also illuminates when any two wheels malfunction, or battery voltage drops **below 8 V**.
- When repairing, if the ABS related connectors are disconnected and the ignition switch is turned to the ON position, the ABS CM will mistakenly detect a fault and record it as a malfunction.
- To protect the ABS HU/CM, make sure the ignition switch is turned off before connecting or disconnecting the ABS CM connector.

(2) Malfunctions in hydraulic system
- Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in an ABS component or the conventional brake system.
- The ABS hydraulic unit contains delicate mechanical parts. If foreign material enters into the component, the ABS may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the ABS does not. Make sure foreign material does not enter when servicing the ABS (e.g. brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting
Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to inspect are:
  - — Connectors not fully seated.
  - — Wiring harness not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harness pass through the firewall, body panels, etc. are the major areas to be inspected.

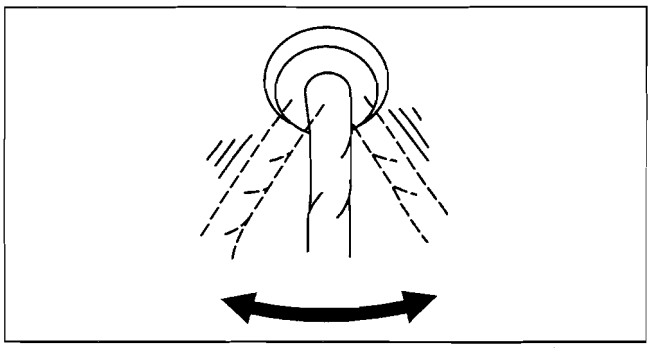
Inspection method for switch connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3zzw0000169

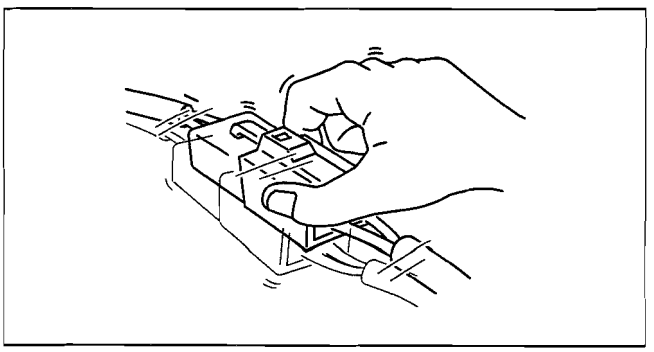
Inspection method for sensor connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3zzw0000169

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

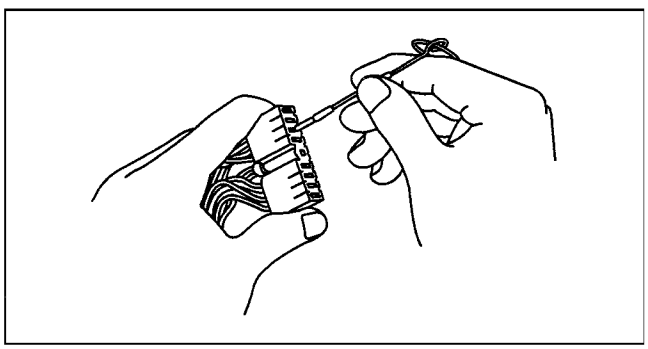
3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or malfunction occurs, inspect the sensor for poor connection and/or poor mounting.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

Connector terminal inspection method

1. Inspect the connection condition of each female terminal.
2. Insert the male terminal to the female terminal and Inspect the female terminal for looseness.



am3zzw0000170

SYMPTOM TROUBLESHOOTING[ABS]

id0403a5804200

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.
4	Both ABS warning light and BRAKE system warning light stay on **4 s or more** when the ignition switch is turned to the ON position.
5	ABS warning light stays on **4 s or more** when the ignition switch is turned to the ON position.
6	BRAKE system warning light stays on **4 s or more** when the ignition switch is turned to the ON position. (Parking brake is released.)
7	There is a malfunction in the system even through ABS warning light, BRAKE system warning light, do not illuminate.

x: Applicable

Troubleshooting item	Possible factor	ABS HU/CM	Instrument cluster	CAN communication	Battery	Brake fluid	Parking brake switch	Charging system	ABS HU/CM power supply (terminal N)	ABS HU/CM GND (terminal B)	Instrument cluster power supply (terminal 1G)	Instrument cluster GND	Conventional brakes	Brake pipe routing
1	Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.	X	X	X							X	X		
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.		X											
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.		X											
4	Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.	X	X	X	X			X	X	X				
5	ABS warning light stays on 4 s or more when the ignition switch is turned to the ON position.	X	X	X										
6	BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position. (Parking brake is released.)	X	X			X	X							
7	There is a malfunction in the system even though ABS warning light, BRAKE system warning light do not illuminate.	X											X	X

am3zzw0000170

NO.1 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801700

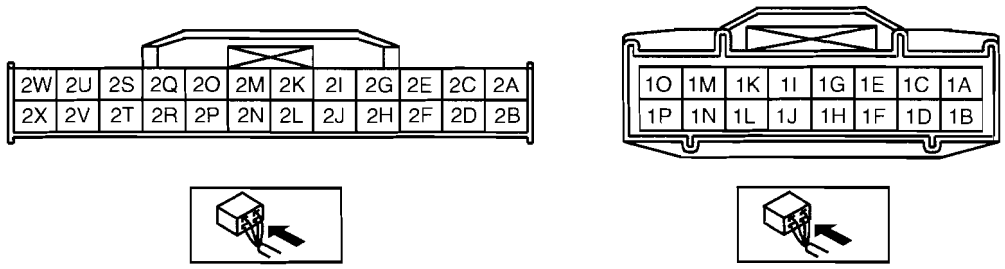
1	**Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.**

[TROUBLESHOOTING HINTS]
- **Instrument cluster or ABS HU/CM malfunction**
- **Improper configuration (instrument cluster)**

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See DTC Table.)
		No	Inspect the instrument cluster. If the instrument cluster is normal, inspect CAN communication. If instrument cluster has a malfunction, go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHT'S COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS** • Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?	Yes	Replace the instrument cluster. (open circuit in instrument cluster) (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.)
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE** • Is the instrument cluster ignition power supply fuse normal?	Yes	Go to the next step.
		No	Inspect for a short to ground on circuit of blown fuse. Repair or replace if necessary. Install appropriate amperage fuse.
*4	**VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER** • Turn the ignition switch to the ON position. • Measure voltage at instrument cluster connector terminal 1G. • Is the voltage **approx. 12 V?**	Yes	Replace the instrument cluster (open circuit in instrument cluster). (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.)
		No	Inspect for open circuit in wiring harness between the instrument cluster and ground. Repair or replace if necessary. Replace the ABS HU/CM. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.2 ABS WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801800

2	**ABS warning light does not illuminate when the ignition switch is turned to the ON position.**
[TROUBLESHOOTING HINTS] • **Instrument cluster malfunction**	

NO.3 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801900

3	**BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.**
[TROUBLESHOOTING HINTS] • **Instrument cluster malfunction**	

NO.4 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5802000

4	**Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.**

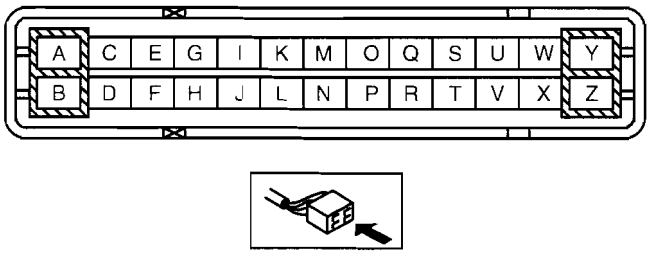
[TROUBLESHOOTING HINTS]
- **ABS HU/CM detects ABS proportioning system malfunction.**
- **ABS HU/CM detects low voltage in power supply (ABS CM ignition terminal N voltage is below approx. 8 V).**
- **ABS HU/CM does not operate.**
- **Malfunction of communication network**

Diagnostic procedure

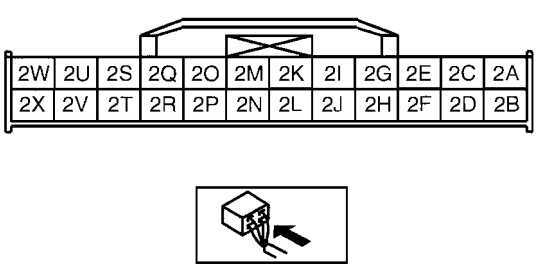
STEP	INSPECTION		ACTION
1	**INSPECT ABS HU/CM POWER SUPPLY FUSE** • Is the ABS HU/CM ignition power supply fuse normal?	Yes	Go to the next step. Inspect for a short to ground on blown fuse's circuit.
		No	Repair or replace if necessary. Install appropriate amperage fuse.
2	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is any error message displayed regarding communication between the ABS HU/CM and M-MDS?	Yes	If the communication error message is displayed even after inspecting according to the procedure displayed on the M-MDS, go to step 6.
		No	Go to the next step.
3	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Inspect the instrument cluster. If the instrument cluster is normal, go to the next step. If the instrument cluster malfunction repair the instrument cluster, go to the next step.
4	**INSPECT BATTERY** • Is the battery voltage normal?	Yes	Go to the next step.
		No	Inspect the battery and charging system. (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
5	**INSPECT CHARGING SYSTEM** • Is the battery voltage normal with electrical load (such as A/C, headlight) on and engine idling?	Yes	Go to the next step.
		No	Inspect the charging system (such as drive belt tension and generator). (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
6	**INSPECT ABS HU/CM IGNITION POWER SUPPLY SYSTEM (TERMINAL N)** • Disconnect the ABS HU/CM connector. • Turn the ignition switch to the ON position. • Inspect the voltage of connector terminal N. **Specification: approx. 8 V** • Is the voltage within the specification?	Yes	Replace the ABS HU/CM (open or short in ground circuit in the ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)
		No	Repair the wiring harness between the ABS HU/CM and ground.
7	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM GROUND FOR CONTINUITY** • Turn the ignition switch to the LOCK position. • Is there continuity between connector terminal B and ground?	Yes	If a malfunction error message is displayed on M-MDS in Step 1 inspection, go to the next step. If a malfunction error message is not displayed on M-MDS in Step 1 inspection, troubleshooting is completed.
		No	Repair the wiring harness between the ABS HU/CM and ground.
8	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY** • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
9	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** • Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.

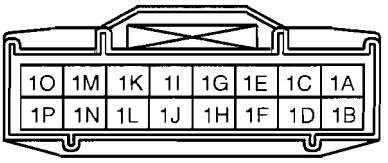
STEP	INSPECTION		ACTION
10	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** • Is there continuity between connector terminal H, L and DLC-2?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





NO.5 ABS WARNING LIGHT STAYS ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

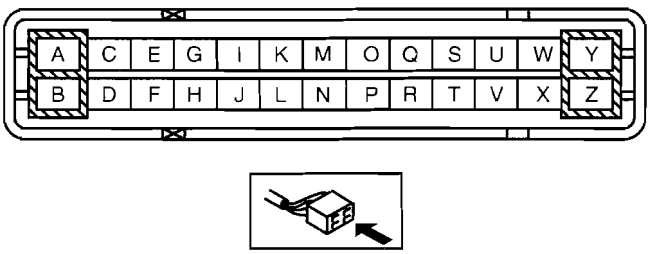
id0403a5802100

5	ABS warning light stays on 4 s or more when the ignition switch is turned to the ON position.
[TROUBLESHOOTING HINTS] • **ABS CM detects ABS system malfunction.**	

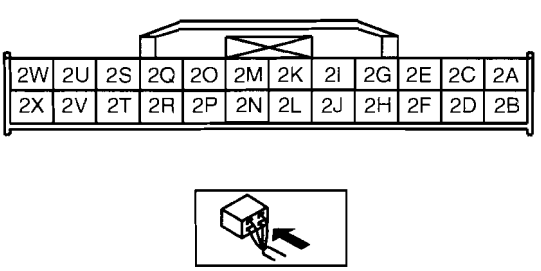
Diagnostic procedure

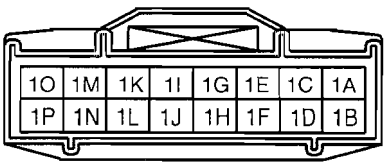
STEP	INSPECTION		ACTION
1	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is any error message displayed regarding communication between ABS HU/CM and M-MDS?	Yes	If the communication error message is displayed even after inspecting according to the procedures displayed in the M-MDS, go to Step 4.
		No	Go to the next step.
2	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Inspect the instrument cluster If the instrument cluster is normal, go to the next step. If the instrument cluster has a malfunction, repair the instrument cluster, go to the next step.
3	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY** • Disconnect the ABS HU/CM connector. • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
4	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** • Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.
5	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** Is there continuity between connector terminal H, L and ground?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.6 BRAKE SYSTEM WARNING LIGHT STAYS ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION (PARKING BRAKE IS RELEASED)[ABS]

id0403a5802200

6	**BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position. (Parking brake is released.)**

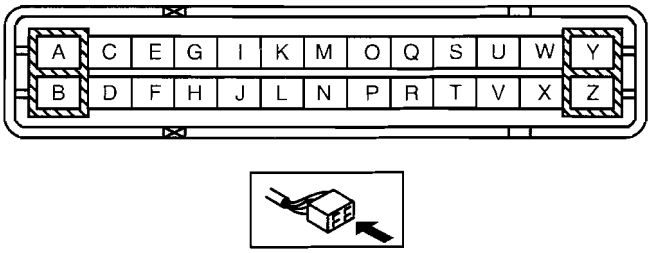
[TROUBLESHOOTING HINTS]
- **Instrument cluster malfunction**
- **Short to ground in circuit in parking brake switch**
- **Brake fluid level sensor is low**

Diagnostic procedure

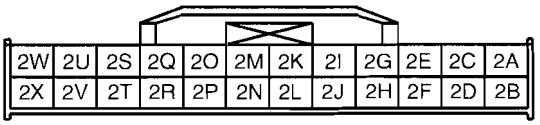
STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID LEVEL** • Is brake fluid level normal?	Yes	Go to the next step.
		No	Add brake fluid.
2	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PARKING BRAKE SWITCH** • Disconnect the parking brake switch connector. • Does BRAKE system warning light go out with the ignition switch is turned to the ON position?	Yes	Replace the parking brake switch. (See 04-12-2 PARKING BRAKE LEVER REMOVAL/ INSTALLATION.)
		No	Perform the following inspection. Repair if necessary. • Short to ground in the wiring harness between the instrument cluster (BRAKE system warning light) and parking brake switch. Inspect the instrument cluster.
*4	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC -2 FOR CONTINUITY** • Disconnect the ABS HU/CM connector. • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
*5	**INSPECT WIRING HARNESS BETWEEN ABS/ HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.
*6	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** Is there continuity between connector terminal H, L and ground?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

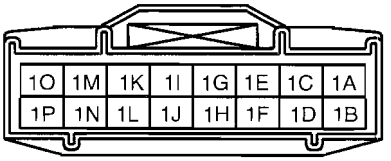
STEP	INSPECTION	ACTION

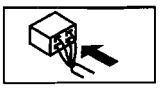
ABS HU/CM WIRING HARNESS-SIDE CONNECTOR

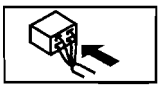


INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR









- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.7 THERE IS MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DO NOT ILLUMINATE[ABS]

id0403a5802300

7	**There is a malfunction in system even though ABS warning light, BRAKE system warning light, do not illuminate.**
[TROUBLESHOOTING HINTS] • **There is a difference in size or air pressure between the front and rear tires.**	

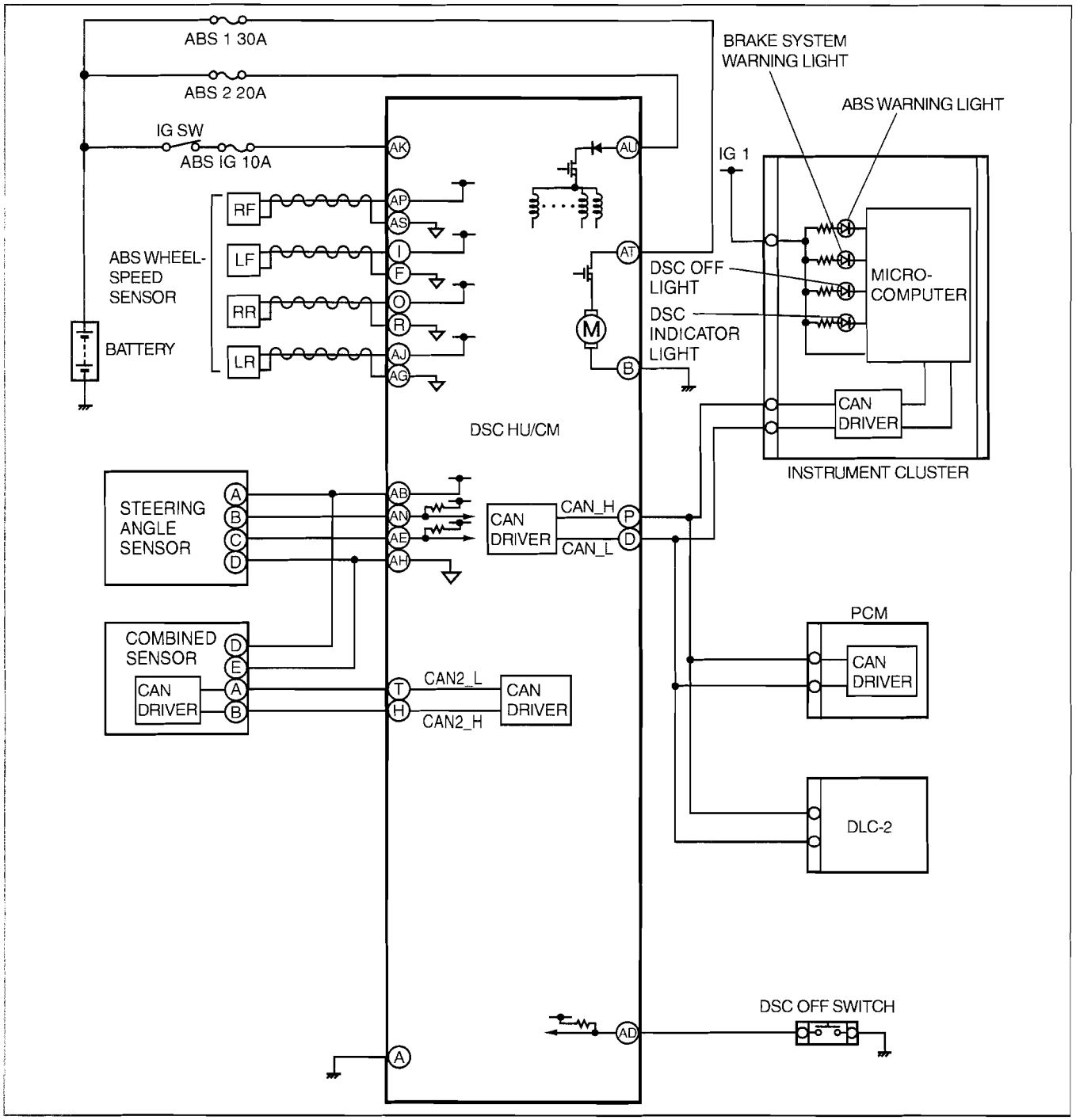
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN ABS HU/CM** Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Go to the next step.
2	**INSPECT ABS HYDRAULIC UNIT** Perform the ABS hydraulic unit on-vehicle inspection. (See 04-13-2 ABS SYSTEM INSPECTION.) Does the system operate properly?	Yes	Inspect the conventional brake system.
		No	**If the wheels do not rotate:** Replace the ABS HU/CM. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.) **If the wheels rotate but order in which wheels rotate is incorrect:** Inspect the brake pipe passage to the ABS HU/CM.

04-03B SYMPTOM TROUBLESHOOTING [DYNAMIC STABILITY CONTROL (DSC)]

SYSTEM WIRING DIAGRAM[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800100



am3uuw0000001

FOREWORD[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800200

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic inspection. To inspect the DTC, follow the DTC Inspection steps. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

PRECAUTION[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800300

1. The ABS warning light and/or BRAKE system warning light and/or DSC indicator light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS and DSC control
• ABS warning light • BRAKE system warning light • DSC indicator light	When the front wheels are jacked up, struck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for **60 s or more.**	After turning the ignition switch off, vehicle is driven at a speed **greater than 10 km/h {6.2 mph}** and normal operation is confirmed.	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control. DSC: Cuts control.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
	Battery voltage at DSC HU/CM ignition terminal drops **below approx. 8 V.**	Battery voltage rises **above approx. 8 V.**	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control. DSC: Cuts control.

2. Precautions during servicing of DSC. The DSC is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.
   (1) Malfunction in electrical system
   - The control module has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light and/or DSC indicator light will illuminate when there is a problem in the electrical system.
     Also, past and present malfunctions are recorded in the control module. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC-2, then turn the ignition switch to the ON position. As a result, the stored malfunctions will be displayed on the M-MDS in numeric order by connecting DLC-2. To find out the causes of DSC malfunctions, use these on-board diagnostic results.
   - If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness.
     The control module usually operates normally. Be careful when searching for the cause of malfunction.
   - After repair, it is necessary to clear the DTC from the control module memory.
     Also, if the DSC related parts have been replaced, verify that the no DTC has been displayed after repairs.
   - After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the control module, the ABS warning light may not go out even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **10 km/h {6.2 mph} or more**, make sure the ABS warning light goes out, and then clear the DTC.
   - When repairing, if the DSC related connectors are disconnected and the ignition switch is turned to the ON position, the control module will mistakenly detect a fault and record it as a malfunction.

   Caution
   - **In DSC vehicles, when the DSC HU/CM, combined sensor is replaced, perform the initialization procedure for each sensor. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)**

   - To protect the control module, make sure the ignition switch is turned off before connecting or disconnecting the control module connector.

   (2) Malfunctions in hydraulic system
   - Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in a DSC component or the conventional brake system.
   - The hydraulic unit contains delicate mechanical parts. If foreign material enters the component, the DSC may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the DSC does not. Make sure foreign materials does not enter when servicing the DSC (e.g. brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting
Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to inspect are:
  - — Connectors not fully seated.
  - — Wiring harness not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harness pass through the firewall, body panels, etc. are the major areas to be inspected.

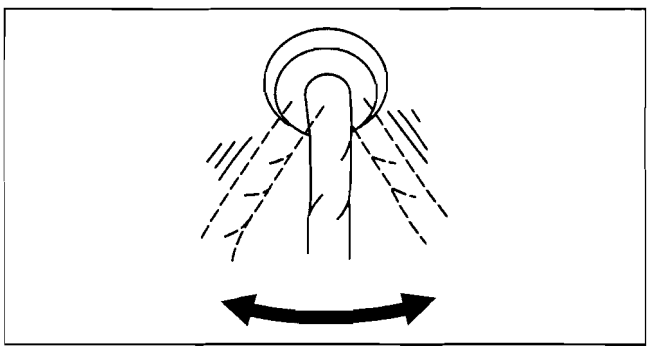
Inspection method for switch connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3uuw0000001

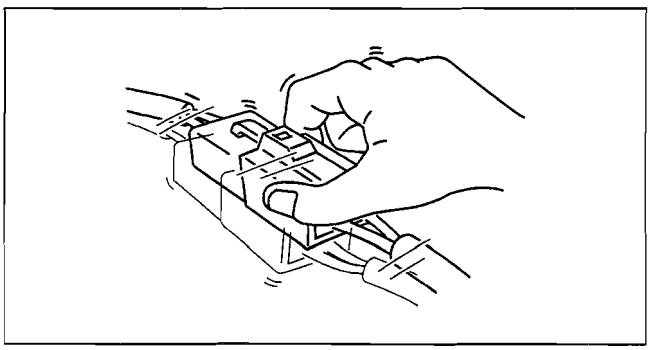
Inspection method for sensor connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3uuw0000001

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

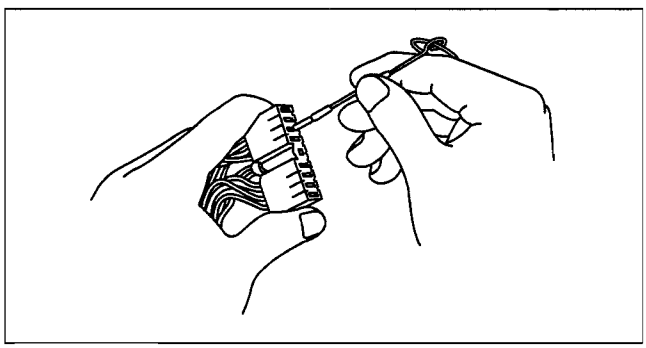
3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or malfunction occurs, inspect the sensor for poor connection and/or poor mounting.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

Connector terminal inspection method

1. Inspect the connection condition of each female terminal.
2. Insert the male terminal to the female terminal and Inspect the female terminal for looseness.



am3uuw0000001

SYMPTOM TROUBLESHOOTING[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800400

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	Any of the following lights do not illuminate when the ignition switch is turned to the ON position. • ABS warning light • BRAKE system warning light • DSC indicator light • DSC OFF light
2	Any of the following lights remain on: • ABS warning light. • BRAKE system warning light • DSC indicator light • DSC OFF light
3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.
4	ABS or TCS*1 operates frequently.
	TCS does not work correctly.
5	DSC*2 operates frequently.
	DSC does not work correctly.

*1 : DSC system contains traction control function; DSC indicator light illuminates and goes out while DSC is operating.

*2 : DSC indicator light illuminates and goes out while DSC is operating.

x: Applicable

Troubleshooting item	Possible factor	DSC HU/CM	Instrument cluster	CAN communication	Each sensor installation	Battery	Charging system	Brake fluid	Parking brake	Tire	Tire air pressure	Control module power supply system	Control module ground system	Instrument cluster power supply system	Instrument cluster ground system	Conventional brake
1	Any of the following lights do not illuminate when the ignition switch is turned to the on position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	X	X	X										X	X	
2	Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	X	X	X	X	X	X	X	X			X	X			
3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light, and DSC OFF light do not illuminate.															X
4	ABS or TCS (*1) operates frequently. /TCS does not work correctly. (*1): DSC system function contains traction control function, DSC indicator light goes on and out while DSC operates.	X			X					X	X					
5	DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and out while DSC operates.	X			X											

*1: DSC system contains traction control function; DSC indicator light illuminates and goes out while DSC is operating.

*2: DSC indicator light illuminates and goes out while DSC is operating.

am3uuw0000001

NO.1 ANY OF THE FOLLOWING LIGHTS DO NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804500

1	**Any of the following lights do not illuminate when the ignition switch is turned to the ON position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).**

[TROUBLESHOOTING HINTS]
- **Inspect each light in the instrument cluster for malfunction.**
- **Poor connection at DSC HU/CM connector**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT IF MALFUNCTION IS IN INSTRUMENT CLUSTER SYSTEM OR OTHER SYSTEM** • Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?	Yes	Go to the next step.
		No	Inspect or repair the instrument cluster (power supply system, ground system).
3	**VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED** • Is the DSC HU/CM connector securely connected?	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
4	**VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED** • Are the DSC HU/CM connector terminal, instrument cluster connector terminal, or related connector terminals securely connected?	Yes	Replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)
		No	Connect the DSC HU/CM connector terminal or related connector terminal securely.

NO.2 ANY OF THE FOLLOWING LIGHTS REMAIN ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804600

2	**Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light)**

[TROUBLESHOOTING HINTS]
- **Brake fluid amount is low.**
- **Parking brake is not released.**
- **No connection at DSC HU/CM connector**
  (When DSC HU/CM connector goes out, ABS warning light and BRAKE system warning light illuminate.)
- **DSC HU/CM detected malfunction (input and output device malfunction).**
- **DSC HU/CM detects low voltage in power supply circuit.**
- **DSC HU/CM ground malfunction**
  (When DSC HU/CM ground is not securely connected, ABS warning light and BRAKE system warning light illuminate but no DTC is displayed.)
- **DSC HU/CM does not operate (DSC HU/CM malfunction).**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID AMOUNT AND VERIFY THAT PARKING BRAKE RELEASES** • Is the brake fluid amount normal? • Is the parking brake lever released?	Yes	Go to the next step.
		No	Add brake fluid or release the parking brake lever.
2	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
3	**INSPECT IF MALFUNCTION IS IN CONTROL MODULE CONNECTOR, TERMINAL OR OTHER** • Do ABS warning light and BRAKE system warning light go out **after 4 s** with the ignition switch turned to the ON position?	Yes	Temporary poor connection in control module connector. Inspect the DSC HU/CM connector, then go to Step 6. Inspect the DSC HU/CM connector terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT BATTERY** • Is the battery voltage normal?	Yes	Go to the next step.
		No	Inspect the battery and charging system. (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
5	**INSPECT CHARGING SYSTEM** • Is the battery voltage normal with electrical load (such as A/C, headlight) on and engine idling?	Yes	Go to the next step.
		No	Inspect the charging system (such as drive belt tension, generator). (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
6	**VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED** • Is the DSC HU/CM securely connected?	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
7	**VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED** • Are DSC HU/CM connector terminal or instrument cluster connector terminal, related connector terminals securely connected?	Yes	Replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)
		No	Connect the DSC HU/CM connector terminal or related connector terminals securely.

NO.3 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND DSC OFF LIGHT DO NOT ILLUMINATE[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804700

3	**There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.**
[TROUBLESHOOTING HINTS] • **There is a mechanical malfunction in the system.**	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT DSC SYSTEM** • Perform the DSC system inspection. • Is the system normal?	Yes	Inspect the conventional brake system.
		No	Repair or replace the malfunctioning part.

NO.4 ABS OR TCS*1 OPERATES FREQUENTLY/TCS DOES NOT WORK CORRECTLY *1: DSC SYSTEM FUNCTION CONTAINs TRACTION CONTROL FUNCTION, DSC INDICATOR LIGHT GOES ON AND OUT WHILE DSC OPERATES[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804800

4	**ABS or TCS (*1) operates frequently./TCS does not work correctly. (*1): DSC system function contains traction control function, DSC indicator light goes on and out while DSC operates.**

[TROUBLESHOOTING HINTS]
- **There is a difference in size or air pressure between the front and rear tires.**
- **Incorrect ABS wheel-speed signal is input to DSC HU/CM**
- **There is a malfunction in the engine control system (TCS malfunction).**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT TIRE SIZE AND AIR PRESSURE** • Inspect the tire size and air pressure. • Are the size and air pressure as specified?	Yes	Go to the next step.
		No	Replace with the specified tires and adjust tire air pressure.
3	**INSPECT ABS WHEEL-SPEED SENSOR OUTPUT VALUE** • Inspect the output value from the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.) • Is the output value normal?	Yes	Found malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING".
		No	• ABS wheel-speed sensor installation inspection: Inspect the ABS wheel-speed sensor for looseness and confirm it is securely adhered. • ABS sensor rotor installation inspection: Inspect the ABS sensor rotor for poor installation.

NO.5 DSC*2 OPERATES FREQUENTLY/DSC DOES NOT WORK CORRECTLY *2: DSC INDICATOR LIGHT GOES ON AND OUT WHILE DSC OPERATES[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804900

5	**DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and off while DSC operates.**

[TROUBLESHOOTING HINTS]
- **DSC HU/CM detected a malfunction (input and output device malfunction).**
- **Poor installation of combined sensor and/or steering angle sensor.**
  (If any of the above sensors are poorly installed, DSC may operate intermittently.)
- **Initialization was not performed for combined sensor, brake fluid pressure sensor when replacing DSC HU/CM, combined sensor.**
  (If initialization is not performed correctly, DSC may not work correctly.)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**VERIFY THAT EACH SENSOR IS INSTALLED** • Are the combined sensor and steering angle sensor securely installed?	Yes	Go to the next step.
		No	Install the malfunctioning sensor securely.
*3	**VERIFY THAT EACH SENSOR IS INITIALIZED** • Did each sensor initialize after replacement of DSC HU/CM, combined sensor?	Yes	Find malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING."
		No	Perform initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)

04-10 GENERAL PROCEDURES

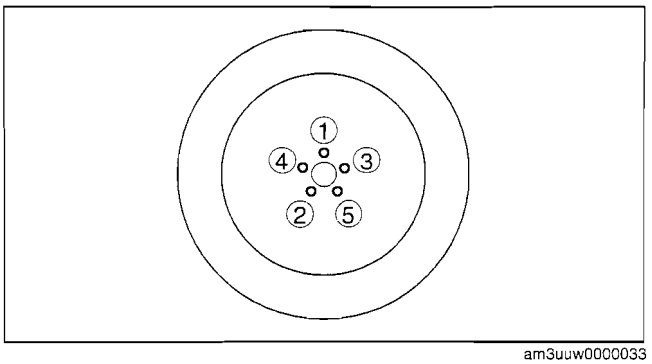
GENERAL PROCEDURES (BRAKE)

id041000800100

Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.

Tightening torque
88.2—117.6 N·m {9.00—11.99 Kgf·m, 65.06—86.73 ft·lbf}



am3uuw0000033

Brake Lines Disconnection

1. If any brake line has been disconnected during the procedures, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Caution
- **Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

Brake Pipe Flare Nut Tightening

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B) or any commercially available flare nut wrench.

Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

ABS Related Parts

1. Make sure that there are no DTCs in the ABS memory after working on ABS related parts. If there are any DTCs in the memory, clear them.

DSC Related Parts Sensor Initialization Procedure

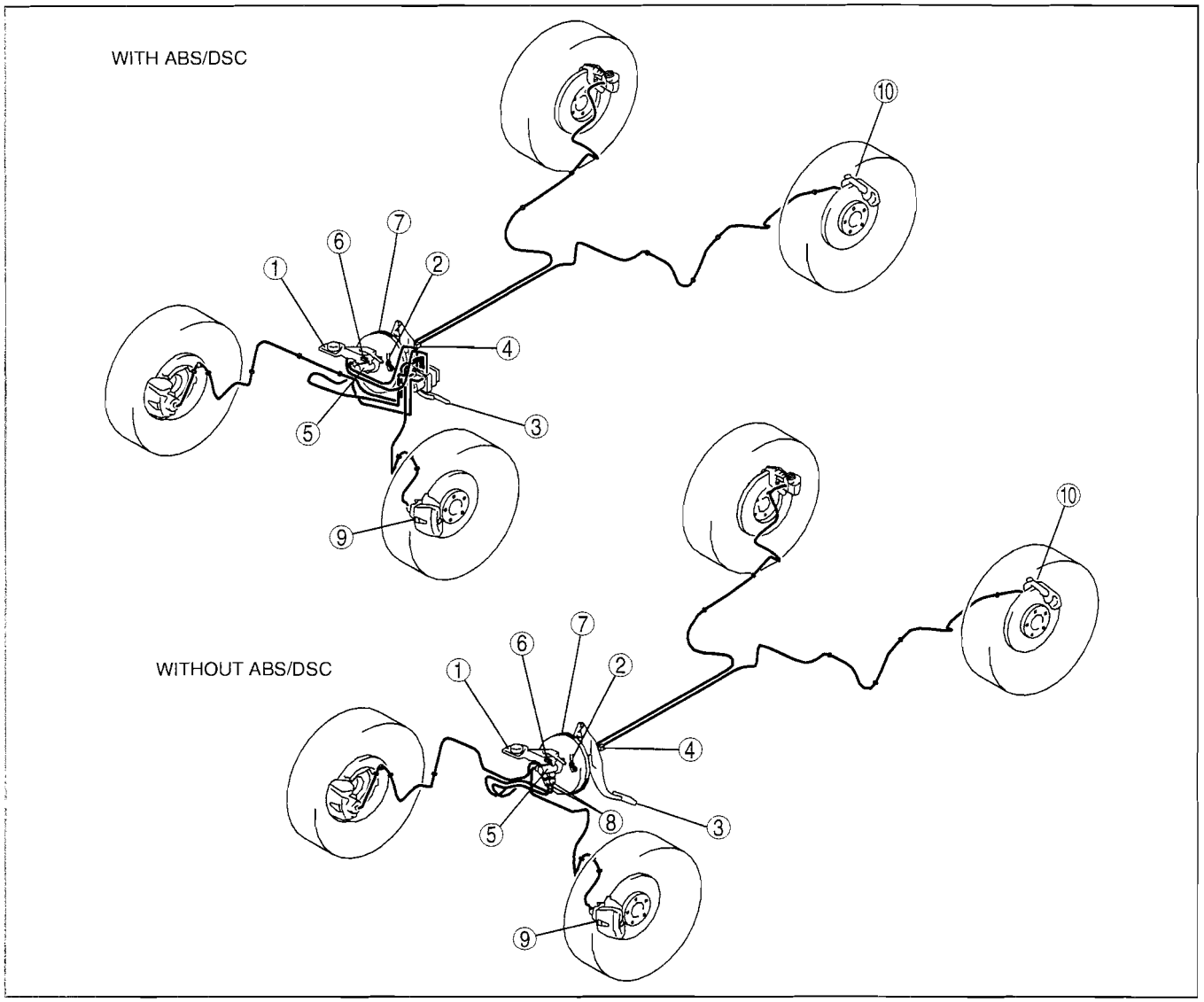
Warning
- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, when replacing or removing the following parts, make sure to perform the initialization procedure to ensure proper DSC operation.**

1. When replacing or removing the following parts, perform the initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
   - DSC HU/CM
   - Combined sensor

04-11 CONVENTIONAL BRAKE SYSTEM

CONVENTIONAL BRAKE SYSTEM LOCATION INDEX

id041100800100



c3u0411w001

1	Brake fluid (See 04-11-3 AIR BLEEDING.)
2	Vacuum line (See 04-11-4 VACUUM LINE INSPECTION.) (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Brake pedal (See 04-11-5 BRAKE PEDAL INSPECTION.) (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
4	Brake switch (See 04-11-8 BRAKE SWITCH INSPECTION.)
5	Master cylinder (See 04-11-9 MASTER CYLINDER REMOVAL/ INSTALLATION[LF, L3].) (See 04-11-10 MASTER CYLINDER REMOVAL/ INSTALLATION[L3 WITH TC].)
6	Brake fluid level sensor (See 04-11-11 BRAKE FLUID LEVEL SENSOR INSPECTION.)

7	Power brake unit (See 04-11-11 POWER BRAKE UNIT INSPECTION.) (See 04-11-13 POWER BRAKE UNIT REMOVAL/ INSTALLATION[LF, L3].) (See 04-11-14 POWER BRAKE UNIT REMOVAL/ INSTALLATION[L3 WITH TC].)
8	Proportioning valve (See 04-11-15 PROPORTIONING VALVE INSPECTION.)

9	Front brake (disc) (See 04-11-15 FRONT BRAKE (DISC) INSPECTION.) (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[LF, L3].) (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[L3 WITH TC].) (See 04-11-21 DISC PAD (FRONT) REPLACEMENT[LF, L3].) (See 04-11-22 DISC PAD (FRONT) REPLACEMENT[L3 WITH TC].) (See 04-11-23 CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[LF, L3].) (See 04-11-25 CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[L3 WITH TC].)

10	Rear brake (disc) (See 04-11-26 REAR BRAKE (DISC) INSPECTION.) (See 04-11-30 REAR BRAKE (DISC) REMOVAL/INSTALLATION.) (See 04-11-31 DISC PAD (REAR) REPLACEMENT.) (See 04-11-32 CALIPER (REAR) DISASSEMBLY/ASSEMBLY.)

AIR BLEEDING

id041100800200

Caution
- **Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

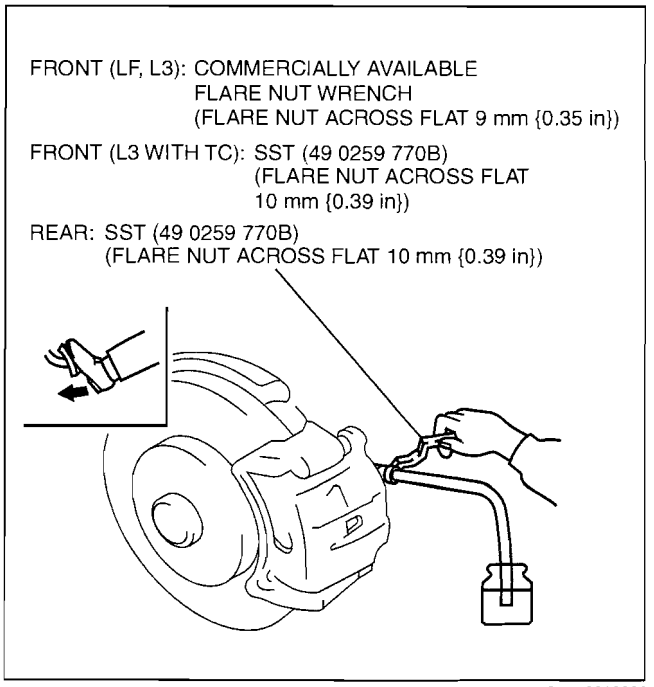
Note
- Keep the fluid level in the reserve tank at 3/4 full or more during the air bleeding.
- Begin air bleeding with the brake caliper that is furthest from the master cylinder.

Brake fluid type
SAE J1703, FMVSS 116 DOT3

1. Remove the bleeder cap on the brake caliper, and attach a vinyl tube to the bleeder screw.
2. Place the other end of the vinyl tube in a clear container and fill the container with fluid during air bleeding.
3. Working with two people, one should pump the brake pedal several times and depress and hold the pedal down.
4. While the brake pedal is depressed, the other should loosen the bleeder screw using the **SST** or any commercially available flare nut wrench, drain out any fluid containing air bubbles, and tighten the bleeder screw.

   Tightening torque
   Front (LF, L3): 7—9 N·m {72—91 kgf·cm, 70—79 in·lbf}
   Front (L3 WITH TC): 12—16 N·m {123—163 kgf·cm, 107—141 in·lbf}
   Rear: 12—16 N·m {123—163 kgf·cm, 107—141 in·lbf}

5. Repeat Steps 3 and 4 until no air bubbles are seen.
6. Perform air bleeding as described in the above procedures for all brake calipers.
7. After air bleeding, inspect the following:
   - Brake operation
   - Fluid leakage
   - Fluid level

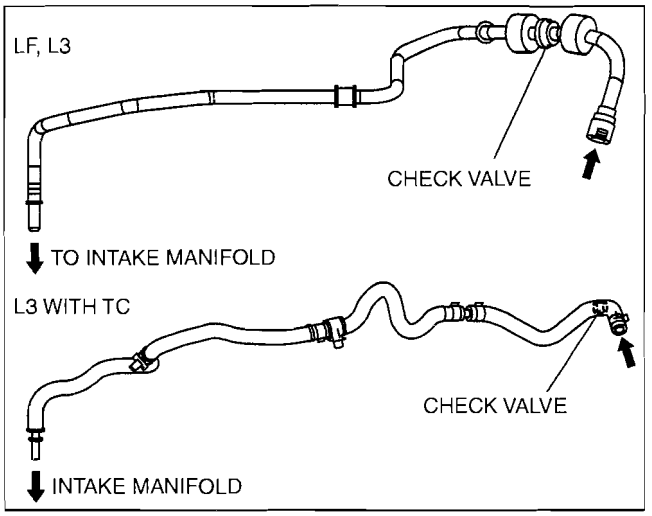


am3uuw0000026

VACUUM LINE INSPECTION

id041100801500

1. Remove the vacuum hose. (See 04-11-4 VACUUM HOSE REMOVAL/INSTALLATION.)
2. Verify that air can be blown from the power brake unit side of the vacuum hose towards the intake manifold side, and that air cannot be blown in the opposite direction.
   - If there is any malfunction of the inner check valve, replace it together with the vacuum hose as a single unit.

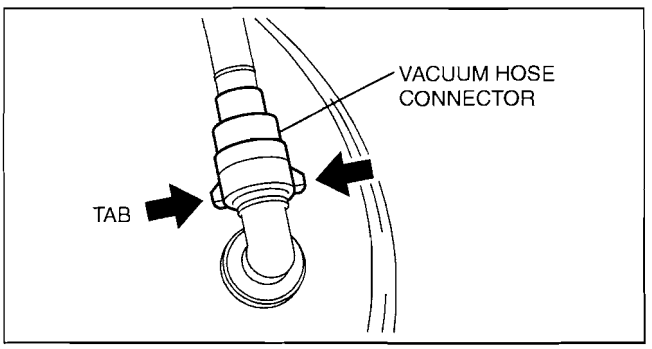


am3uuw0000039

VACUUM HOSE REMOVAL/INSTALLATION

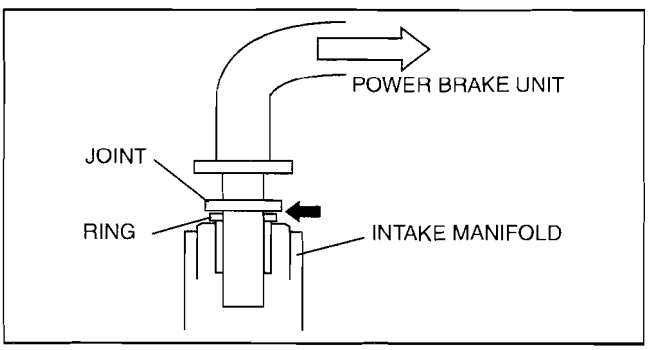
id041100801600

1. Disconnect the vacuum hose connector from the power brake unit while pressing the tabs of the vacuum hose connector. (LF, L3)
2. Pinch open the clip using pliers and disconnect the vacuum hose from the power brake unit. (L3 WITH TC)



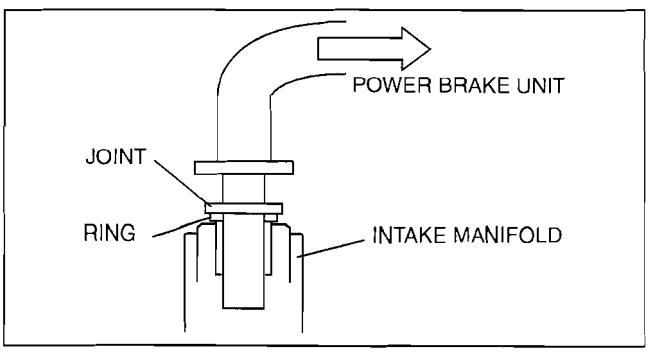
am3uuw0000027

3. Insert a thin flathead screwdriver at the point indicated by the arrow in the figure, push the ring down and disconnect the vacuum hose from the intake manifold.
4. Remove the vacuum hose.
5. Install in the reverse order of removal.



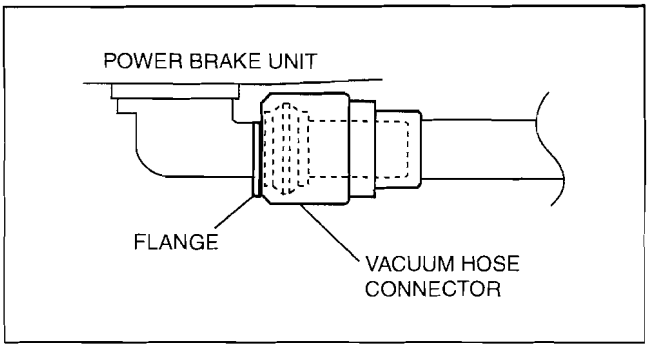
am3uuw0000027

6. Verify that the vacuum hose is inserted so that the joint contacts the intake manifold ring. (LF, L3)
7. Insert the vacuum hose connector to the power brake unit. (LF, L3)



am3uuw0000027

8. Verify that the vacuum hose is inserted so that the connector contacts the power brake unit flange. (LF, L3)



am3uuw0000027

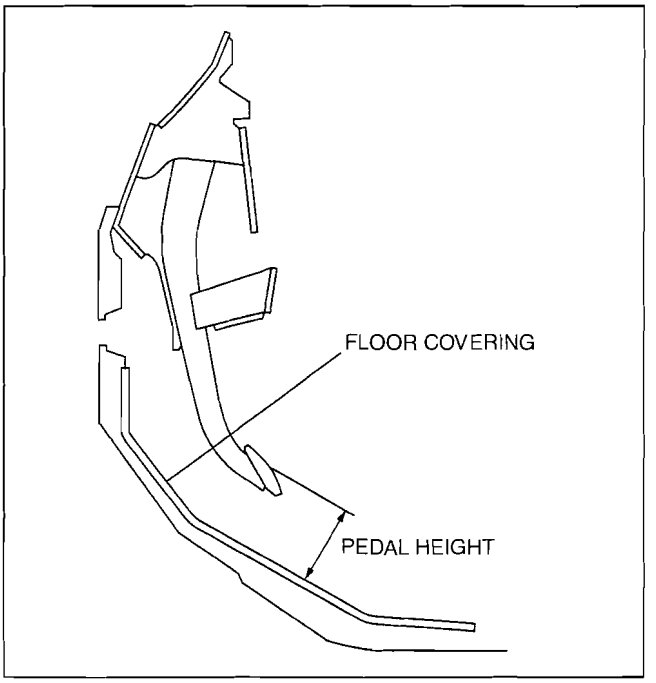
BRAKE PEDAL INSPECTION

id041100801100

Pedal Height Inspection

1. Measure the distance from the center of the upper surface of the pedal pad to the floor covering and verify that it is as specified.
   - If not within the specification, replace the brake pedal.

Brake pedal height (reference value)
136.4 mm {5.37 in}



am3uuw0000074

Pedal Play Inspection

1. Pump the pedal several times to release the vacuum in the power brake unit.
2. Gently depress the pedal by hand and measure the pedal play.
   - If not within the specification, inspect the wear of the joint pin. Replace it if there is any malfunction.

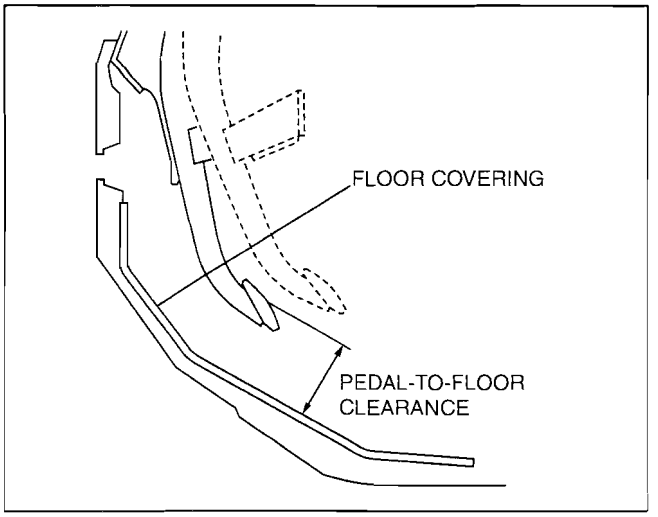
Brake pedal play
4.0—8.4 mm {0.16—0.33 in}

Note
- If there is no malfunction in the joint pin, there is a possibility that the power brake unit has some malfunction. Verify that there are no malfunctions, and replace it if necessary.

Pedal-to-floor Clearance Inspection

1. Start the engine and depress the brake pedal with a force of **147 N {15.0 kgf, 33.0 lbf}**.
2. Measure the distance from the center of the upper surface of the pedal pad to the floor covering and verify that it is as specified.
   - If it is less than the specification, inspect for air in the brake line.

Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 kgf, 33.0 lbf})
89.8 mm {3.54 in} or more



am3uuw0000074

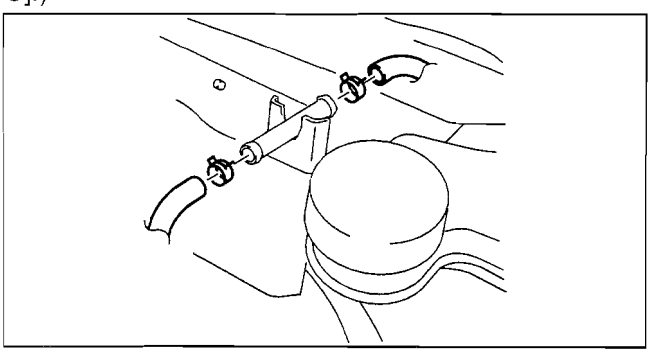
BRAKE PEDAL REMOVAL/INSTALLATION

id041100801200

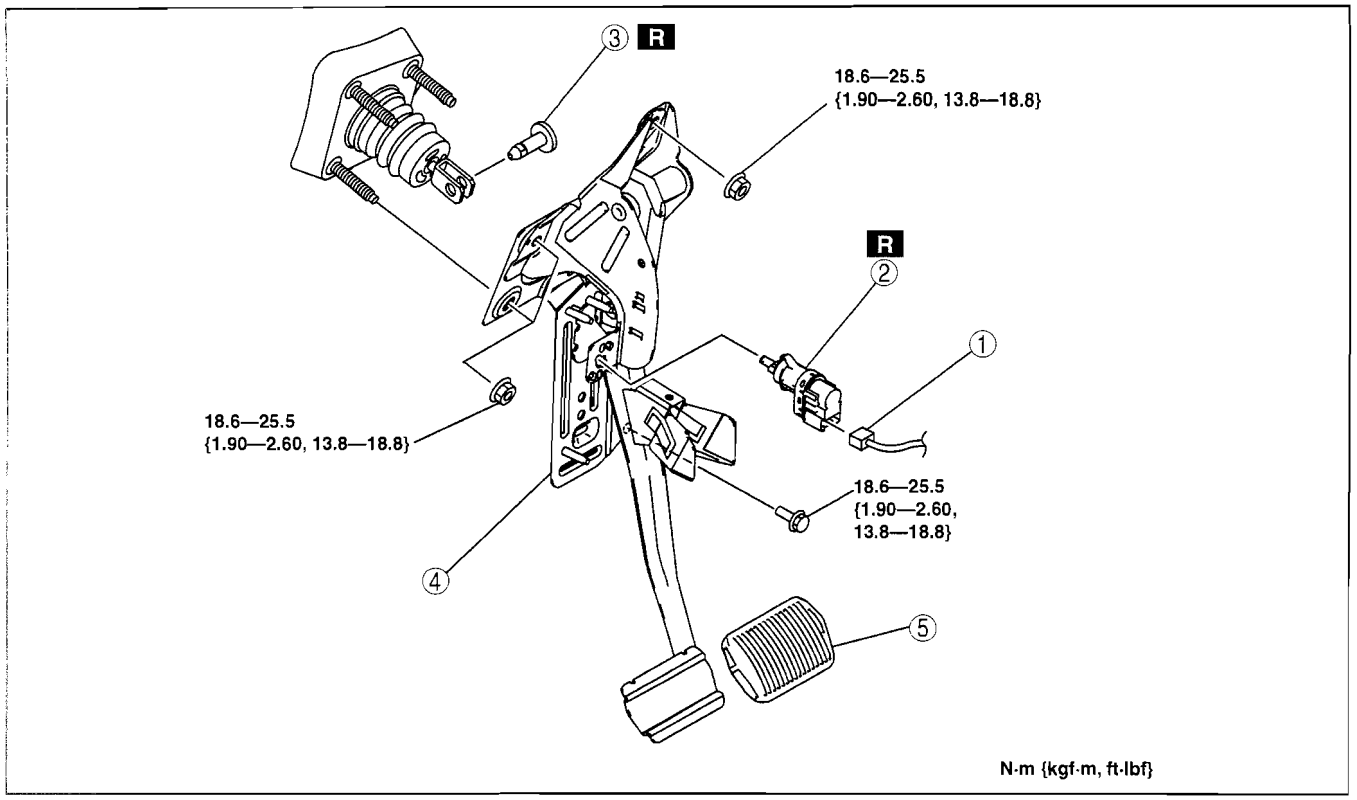
Caution

- **The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch is inserted into the installation hole on the brake pedal and rotated to fix in place. If the brake switch is not properly installed, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake pedal is properly installed and fully released before installing the brake switch to the pedal.**
- **Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.**

1. Remove the charge air cooler cover. (L3 WITH TC) (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the vacuum hose from the insulator pipe as shown in the figure. (L3 WITH TC)
4. Remove the insulator. (L3 WITH TC) (see 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
5. Disconnect the brake pipe (master cylinder side). (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].) (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the accelerator pedal. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3].) (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove in the order indicated in the table.


am3uuw0000038

8. Install in the reverse order of removal.



c3u0411w008

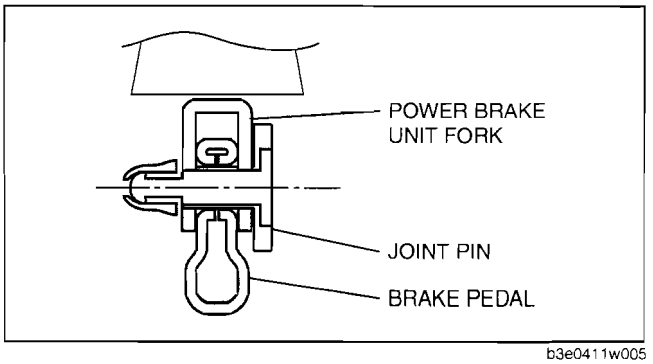
1	Brake switch connector
2	Brake switch (See 04-11-8 Brake Switch Installation Note.)
3	Joint pin (See 04-11-7 Joint Pin Installation Note.)
4	Brake pedal (See 04-11-7 Brake Pedal Removal Note.)
5	Pedal pad

Brake Pedal Removal Note

1. Remove the brake pedal installation bolts and nuts.
2. Move the power brake unit to the vehicle front where the power brake unit fork does not interfere with the brake pedal arm.
3. Remove the brake pedal.

Joint Pin Installation Note

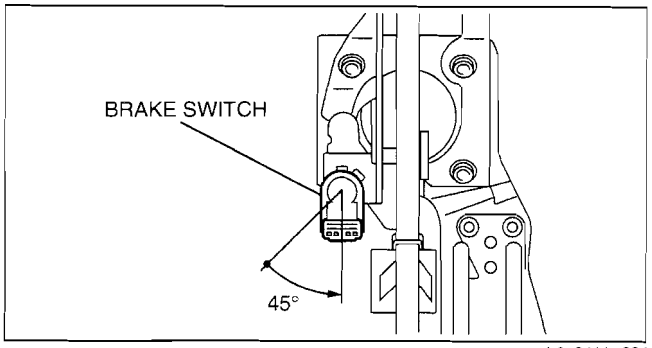
1. Install the new joint pin by aligning the pin holes of the brake pedal and power brake unit fork.
2. Verify that the joint pin touches the power brake unit fork completely.



b3e0411w005

Brake Switch Installation Note

1. Inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)
2. With the brake pedal fully released, insert a new brake switch into the installation hole on the brake pedal.
3. Secure the brake switch by turning it counterclockwise **45°**.



b3e0411w004

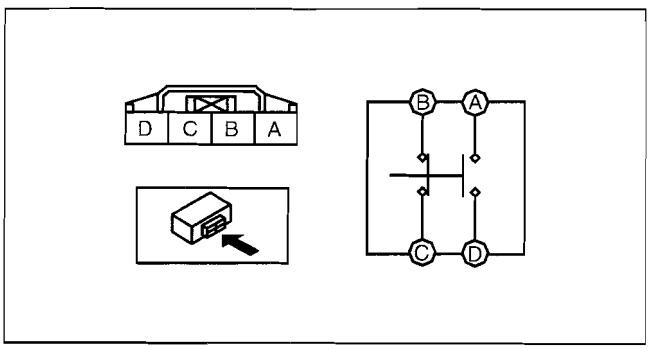
BRAKE SWITCH INSPECTION

id041100801900

Caution

- **Inspect the brake switch with it installed to the brake pedal, otherwise the brake switch may not operate normally. If the brake switch is removed from the brake pedal, replace the brake switch with a new one.**

1. Remove the lower panel.
2. Remove the column cover.
3. Disconnect the brake switch connector.
4. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the brake switch.



c3u0411w005

O—O : Continuity

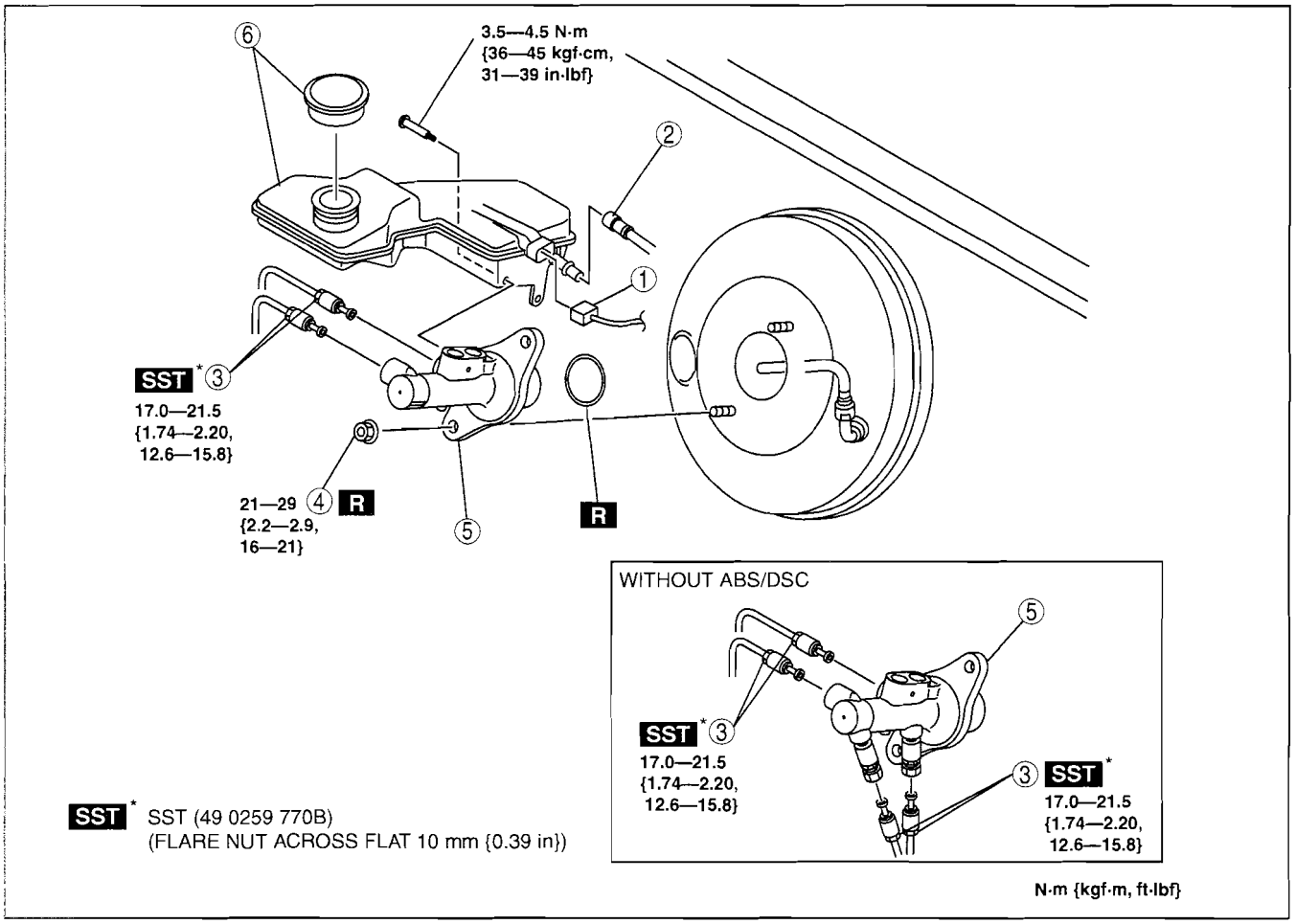
Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed	O			O
When the brake pedal is not depressed		O	O	

c3u0411w006

MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3]

id041100801338

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

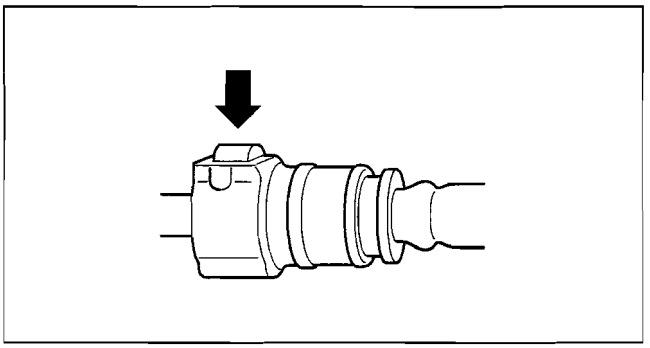


am3uuw0000026

1	Brake fluid level sensor connector
2	Reserve hose (MTX) (See 04-11-9 Reserve Hose (MTX) Removal Note.) (See 04-11-9 Reserve Hose (MTX) Installation Note.)
3	Brake pipe
4	Nut
5	Master cylinder
6	Reserve tank, cap

Reserve Hose (MTX) Removal Note

1. Remove the reserve hose from the reserve tank while pressing the point indicated by the arrow in the figure.



am3uuw0000026

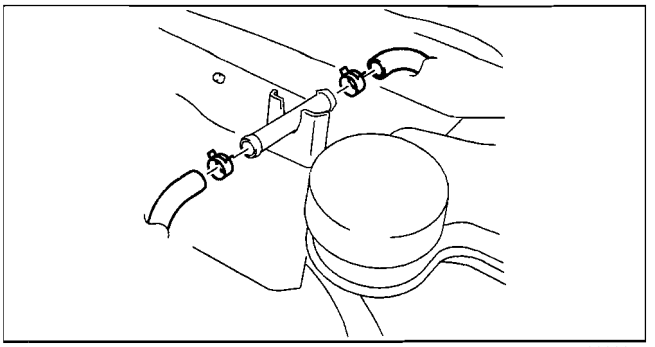
Reserve Hose (MTX) Installation Note

1. Insert the reserve hose to the reserve tank until a click is heard.
2. Verify that the reserve hose is firmly installed by pulling it, and push it into the reserve tank again.

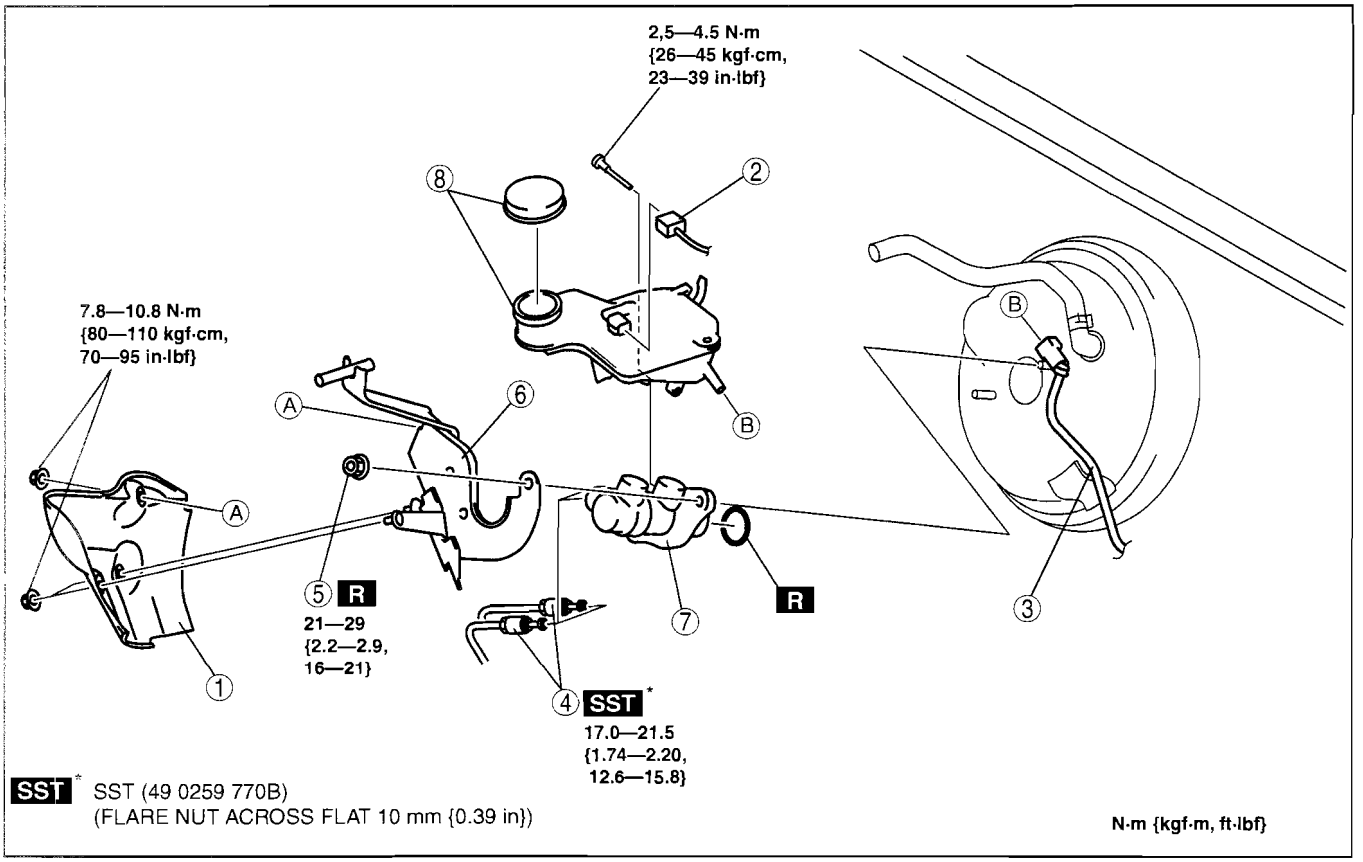
MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC]

id041100801339

1. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the vacuum hose from the insulator pipe as shown in the figure.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



am3uuw0000038



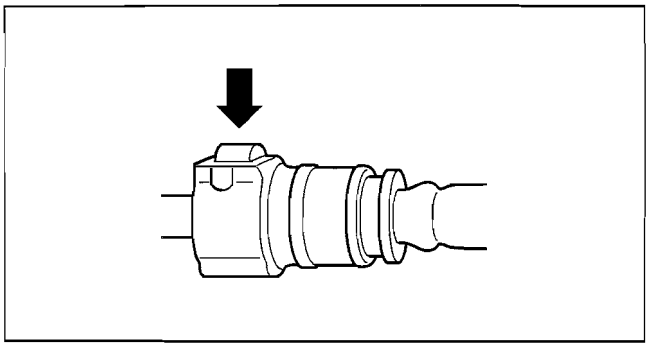
am3uuw0000039

1	Insulator
2	Brake fluid level sensor connector
3	Reserve hose (See 04-11-11 Reserve Hose Removal Note.) (See 04-11-11 Reserve Hose Installation Note.)
4	Brake pipe
5	Nut

6	Insulator bracket (See 04-11-11 Insulator Bracket, Master Cylinder Removal Note.) (See 04-11-11 Insulator Bracket, Master Cylinder Installation Note.)
7	Master cylinder (See 04-11-11 Insulator Bracket, Master Cylinder Removal Note.) (See 04-11-11 Insulator Bracket, Master Cylinder Installation Note.)
8	Reserve tank, cap

Reserve Hose Removal Note

1. Remove the reserve hose from the reserve tank while pressing the point indicated by the arrow in the figure.



am3uuw0000027

Insulator Bracket, Master Cylinder Removal Note

1. Remove the insulator bracket and master cylinder from the power brake unit as a single unit.
2. Remove the insulator bracket from the master cylinder.

Insulator Bracket, Master Cylinder Installation Note

1. Temporarily install the insulator bracket to the master cylinder.
2. Install the insulator bracket and master cylinder to the power brake unit as a single unit.

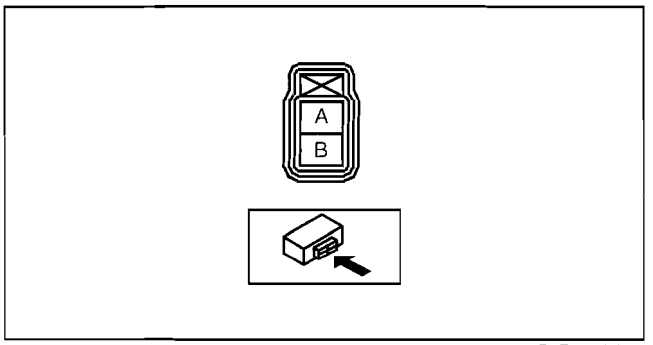
Reserve Hose Installation Note

1. Insert the reserve hose to the reserve tank until a click is heard.
2. Verify that the reserve hose is firmly installed by pulling it, and push it into the reserve tank again.

BRAKE FLUID LEVEL SENSOR INSPECTION

id041100801400

1. Disconnect the brake fluid level sensor connector from the master cylinder.
2. Inspect for continuity according to fluid level between the brake fluid level sensor terminals.
   - If not as indicated in the table, replace the reserve tank.



B3E0411W039

O—O: Continuity

Condition	Terminal	
	A	B
Above MIN		
Below MIN	O	O

chu0411w017

POWER BRAKE UNIT INSPECTION

id041100801700

Note

- The following inspection methods are simple inspection methods to judge the function of the power brake unit.
- If there is any malfunction in the power brake unit, replace the power brake unit as a single unit.

Without Using SST

Operation inspection

1. With the engine stopped, pump the pedal a few times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after starting the engine, the unit is normal.

Vacuum function inspection

1. Start the engine.
2. Stop the engine after driving the vehicle for **1—2 min.**
3. Depress the pedal with normal force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is normal.
   - If a problem is found, inspect for damage to or improper installation of the check valve and vacuum hose. After repairing, inspect again.

Vacuum loss function inspection

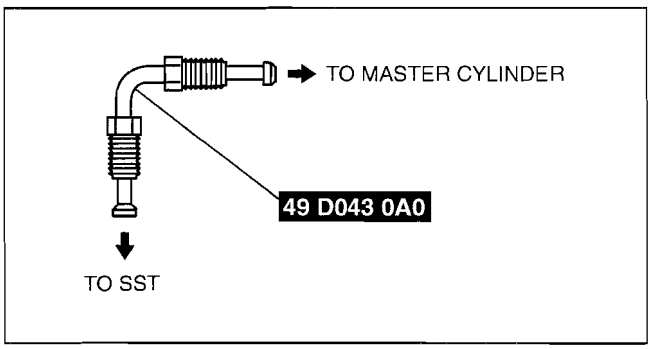
1. Start the engine.
2. Depress the pedal with normal force.
3. With the pedal depressed, stop the engine.
4. Hold the pedal depressed for **approx. 30 s.**
5. If the pedal height does not change during this time, the unit is normal.

Using SST

Pre-inspection preparation

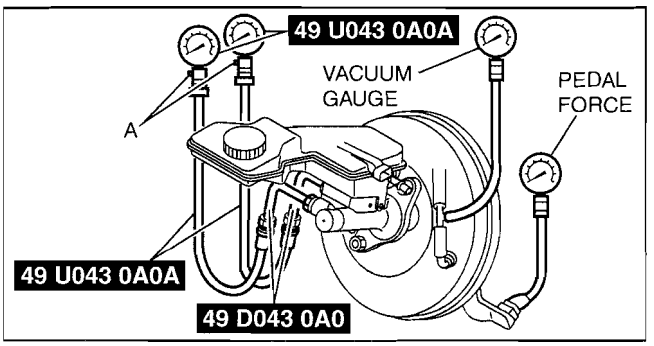
1. Install the **SST** (49 D043 0A0) to the master cylinder in the orientation shown in the figure.

   Note
   - When installing the **SST** (49 D043 0A0) to the master cylinder, use a commercially available flare nut wrench.
     — Flare nut across flat: **12 mm {0.47 in}**



c3u0411w009

2. Connect the **SSTs**, a vacuum gauge, and a pedal force gauge to the master cylinder, and bleed the air from the **SSTs** and the brake line. (Bleed the air from the **SSTs** using air bleed valve A.)



c3u0411w010

Vacuum loss inspection

1. Start the engine.
2. Depress the brake pedal with a force of **200 N {20.4 kgf, 44.9 lbf}**.
3. Stop the engine when the vacuum gauge reading reaches **68 kPa {510 mmHg, 20.1 inHg}** with the pedal depressed.
4. With the engine off, observe the vacuum gauge for **15 s.**
5. If the gauge has dropped **3.3 kPa {25 mmHg, 1.0 inHg}** or less, the unit is normal.

Lack of hydraulic pressure inspection

1. If the pedal force and fluid pressure correlation is within the specification with the engine stopped and a vacuum amount of **0 kPa {0 mmHg, 0 inHg}**, the system is normal.

Master cylinder fluid pressure

Vacuum amount at 0 kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbf}	500 kPa {5.10 kgf/cm^2, 72.6 psi} or more

Hydraulic pressure inspection

1. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
2. At this time, apply the indicated pedal force and if the fluid pressure is within the specification, the unit is normal.

Master cylinder fluid pressure (except L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	6,500 kPa {66.29 kgf/cm^2, 942.8 psi} or more

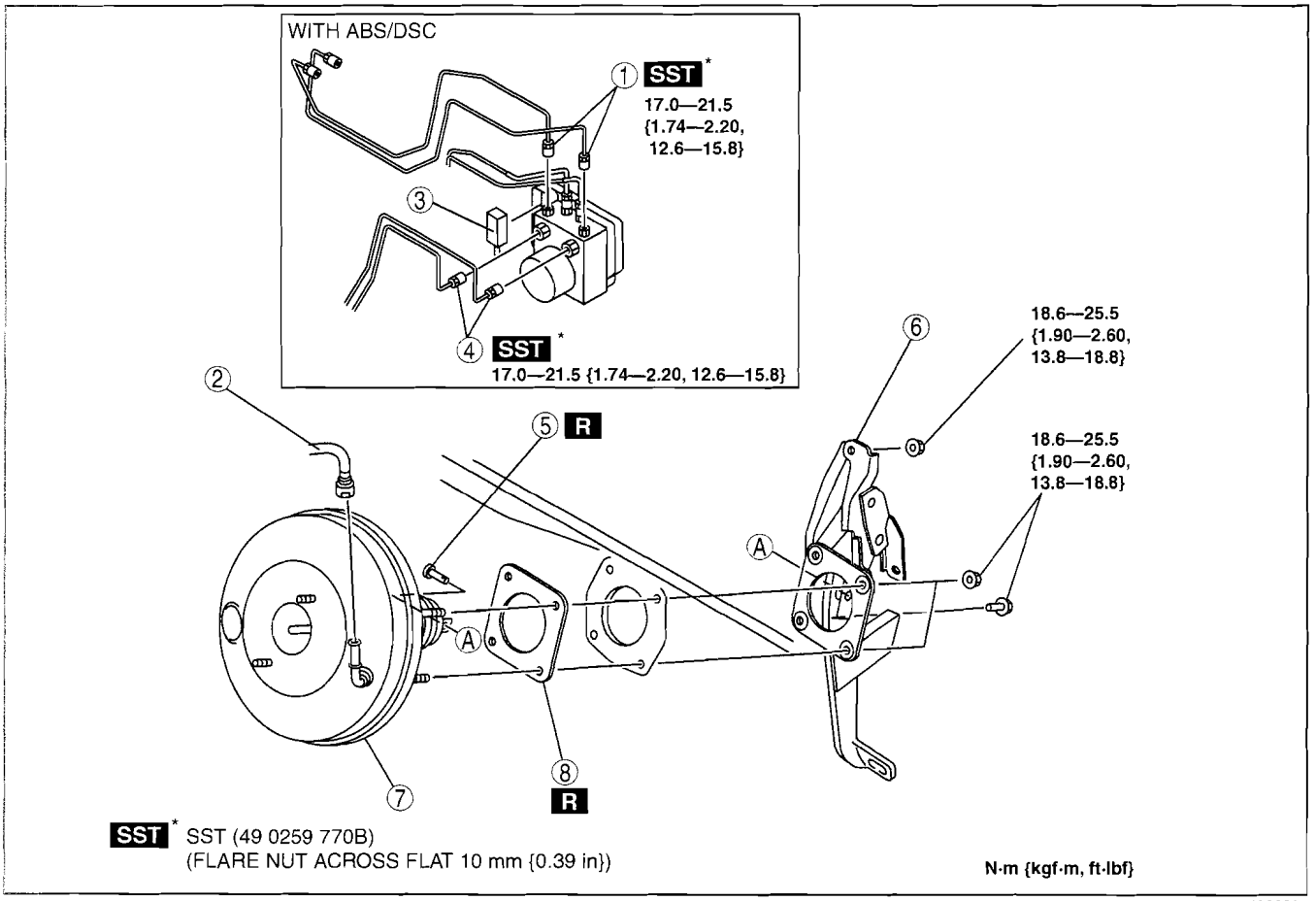
Master cylinder fluid pressure (L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	7,000 kPa {71.39 kgf/cm^2, 1,016 psi} or more

POWER BRAKE UNIT REMOVAL/INSTALLATION[LF, L3]

id041100801838

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the master cylinder. (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].)
3. Remove the brake switch connector.
4. Remove the accelerator pedal. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. After installation, inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)



am3uuw0000027

1	Brake pipe
2	Vacuum hose (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Connector (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
4	Brake pipe

5	Joint pin (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
6	Brake pedal component (See 04-11-14 Brake Pedal Component Removal Note.)
7	Power brake unit
8	Gasket

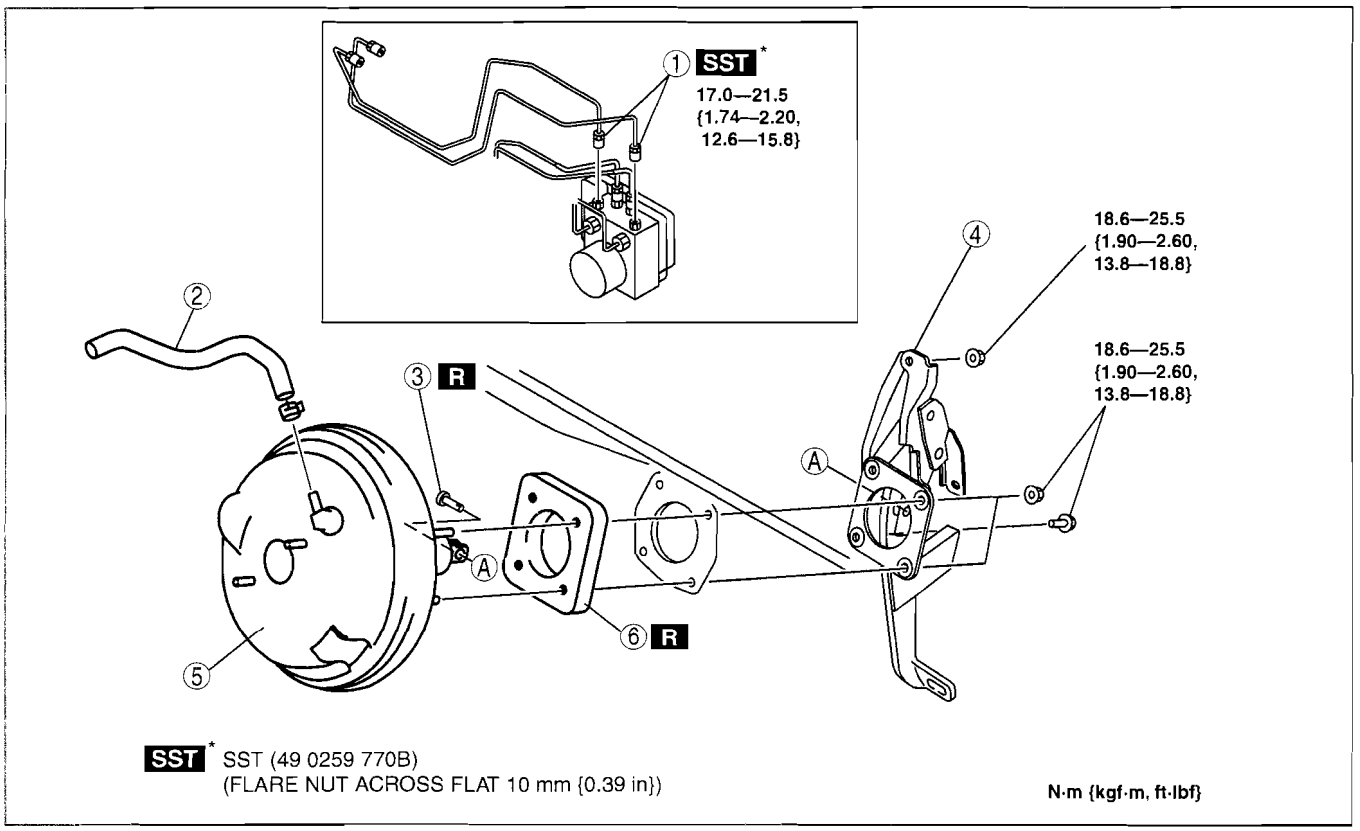
Brake Pedal Component Removal Note

1. Remove the brake pedal installation bolt and nuts.
2. Move the power brake unit toward the vehicle front.
3. Remove the brake pedal component.

POWER BRAKE UNIT REMOVAL/INSTALLATION[L3 WITH TC]

id041100801839

1. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the master cylinder. (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the air hose and air duct. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the brake switch connector.
5. Remove the accelerator pedal. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. After installation, inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)



am3uuw0000039

1	Brake pipe
2	Vacuum hose (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Joint pin (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)

4	Brake pedal component (See 04-11-14 Brake Pedal Component Removal Note.)
5	Power brake unit
6	Gasket

Brake Pedal Component Removal Note

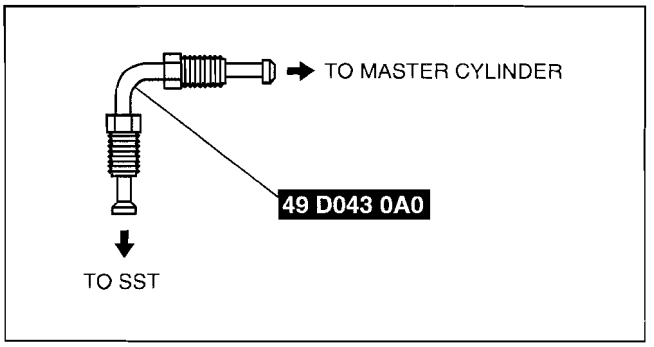
1. Remove the brake pedal installation bolt and nuts.
2. Move the power brake unit toward the vehicle front.
3. Remove the brake pedal component.

PROPORTIONING VALVE INSPECTION

id041100804300

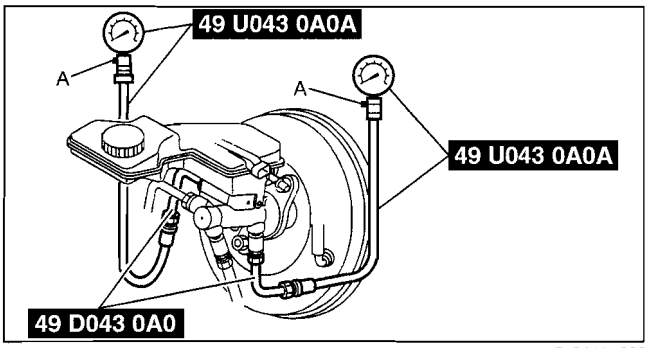
1. Disconnect the master cylinder brake pipes, and install the **SST** (49 D043 0A0) to the master cylinder orientated as shown in the figure.

   Note
   - Use a commercially available flare nut wrench when installing the **SST** (49 D043 0A0) to the master cylinder.
     — Flare nut across flat: **12 mm {0.47 in}**



c3u0411w009

2. Connect the **SSTs** as shown in the figure, and bleed the air from the **SSTs** and the brake line. (Bleed the air from the **SSTs** using air bleed valve A.)
3. Inspect the rear brake fluid pressure when the front brake fluid pressure is adjusted to the level indicated in the table.
   - If not within the specification, replace the master cylinder.



c3u0411w003

04-11

Proportioning valve fluid pressure

Front brake fluid pressure (kPa {kgf/cm^2, psi})	Rear brake fluid pressure (kPa {kgf/cm^2, psi})
5,000 {50.99, 725.2}	3,500—3,700 {35.70—37.72, 507.7—536.6}
10,000 {101.97, 1450.4}	4,950—5,250 {50.48—53.53, 718.0—761.4}

FRONT BRAKE (DISC) INSPECTION

id041100800800

Brake Judder Repair Hints

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. The steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

Brake pedal vibration

1. When applying the brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

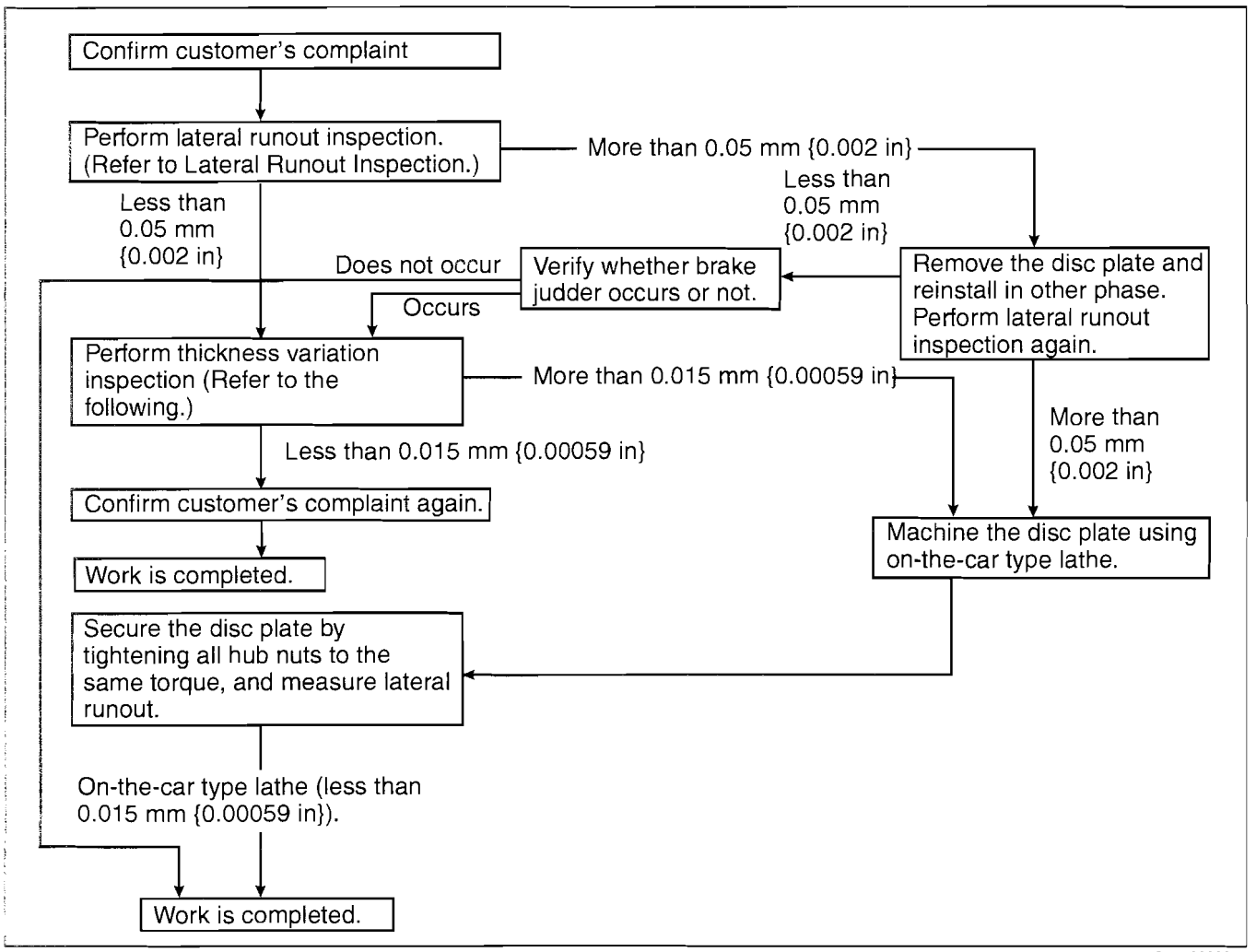
The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of the disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

Due to corrosion, the thickness and friction coefficient of the disc plate change.

1. If the vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of the disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



am3uuw0000037

Lateral runout inspection

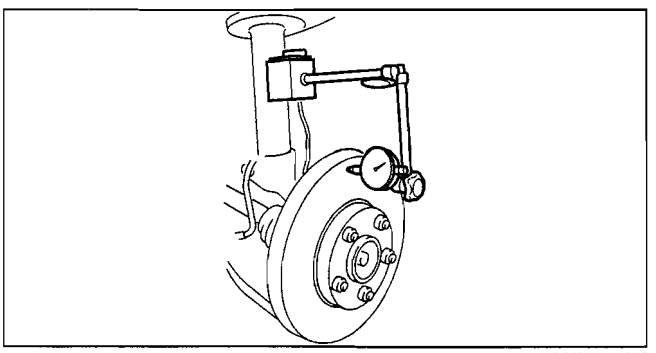
1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

Note

- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of the disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Front disc plate runout limit
0.05 mm {0.002 in}



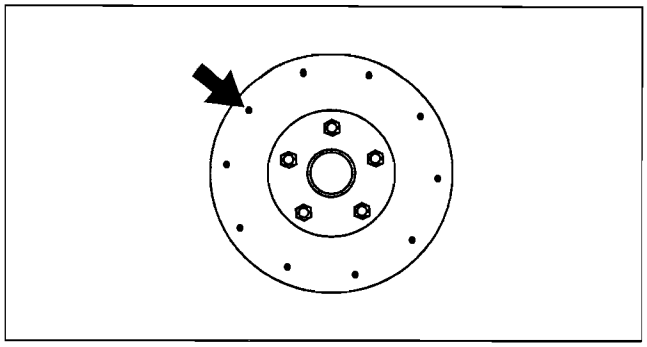
b3j0411w049

Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within the specification, machine the disc plate using a lathe.

Thickness variation limit
0.015 mm {0.00059 in}

Warning
- **Do not exceed minimum disc plate thickness.**



am3uuw0000037

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

Minimum front disc plate thickness
23 mm {0.91 in}

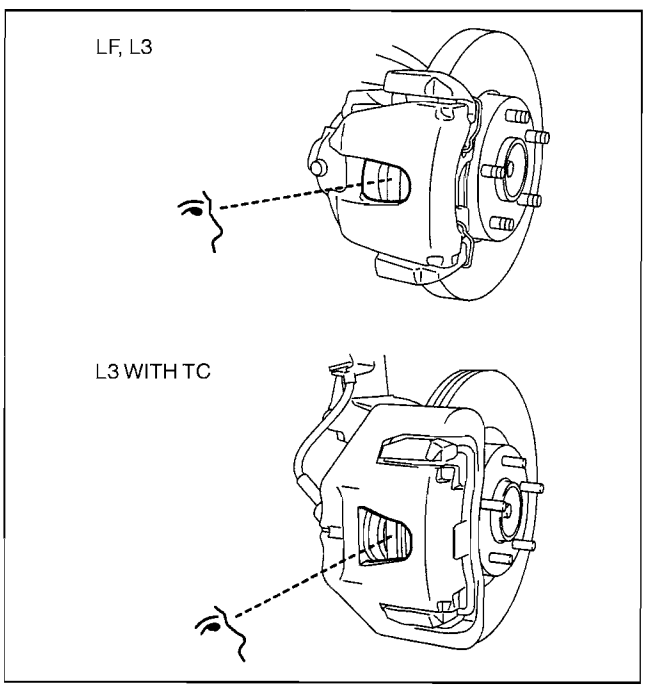
Minimum front disc plate thickness after machining using a brake lathe on-vehicle
23.8 mm {0.94 in}

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Verify the remaining thickness of the pads.

Minimum front disc pad thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.

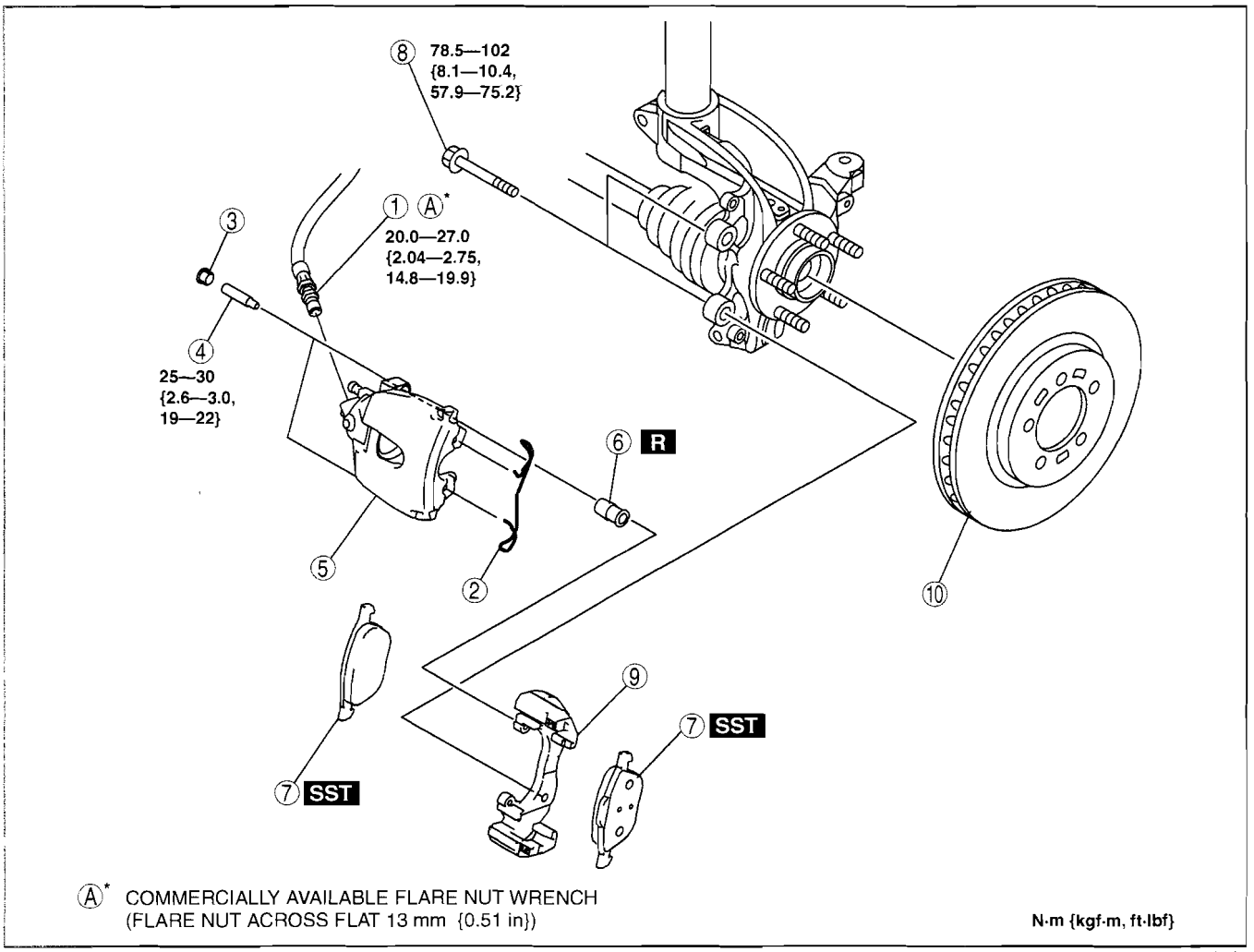


am3uuw0000037

FRONT BRAKE (DISC) REMOVAL/INSTALLATION[LF, L3]

id041100800938

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



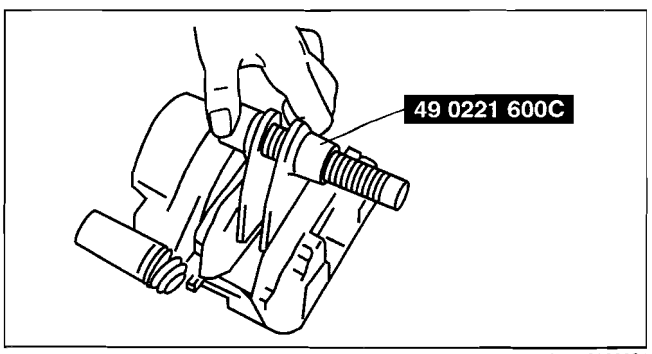
d3u411zwb101

1	Brake hose (See 04-11-19 Brake Hose Installation Note.)
2	Retaining clip
3	Cap
4	Bolt
5	Caliper

6	Boot
7	Disc pad (See 04-11-18 Disc Pad Installation Note.)
8	Bolt
9	Mounting support
10	Disc plate

Disc Pad Installation Note

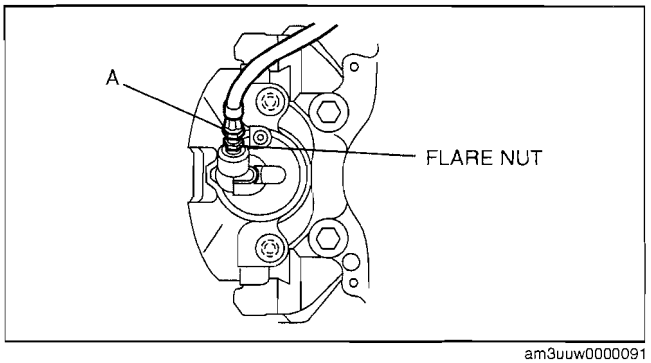
1. Clean the exposed area of the piston.
2. Push the piston in using the **SST**.
3. Install the disc pad (outer side) to the mounting support.
4. Install the disc pad (inner side) to the caliper.



am3uuw0000091

Brake Hose Installation Note

1. Install the brake hose to the caliper.
2. Tighten the flare nut while holding the brake hose at point A with a spanner or equivalent.
3. Verify that the brake hose is not twisted.

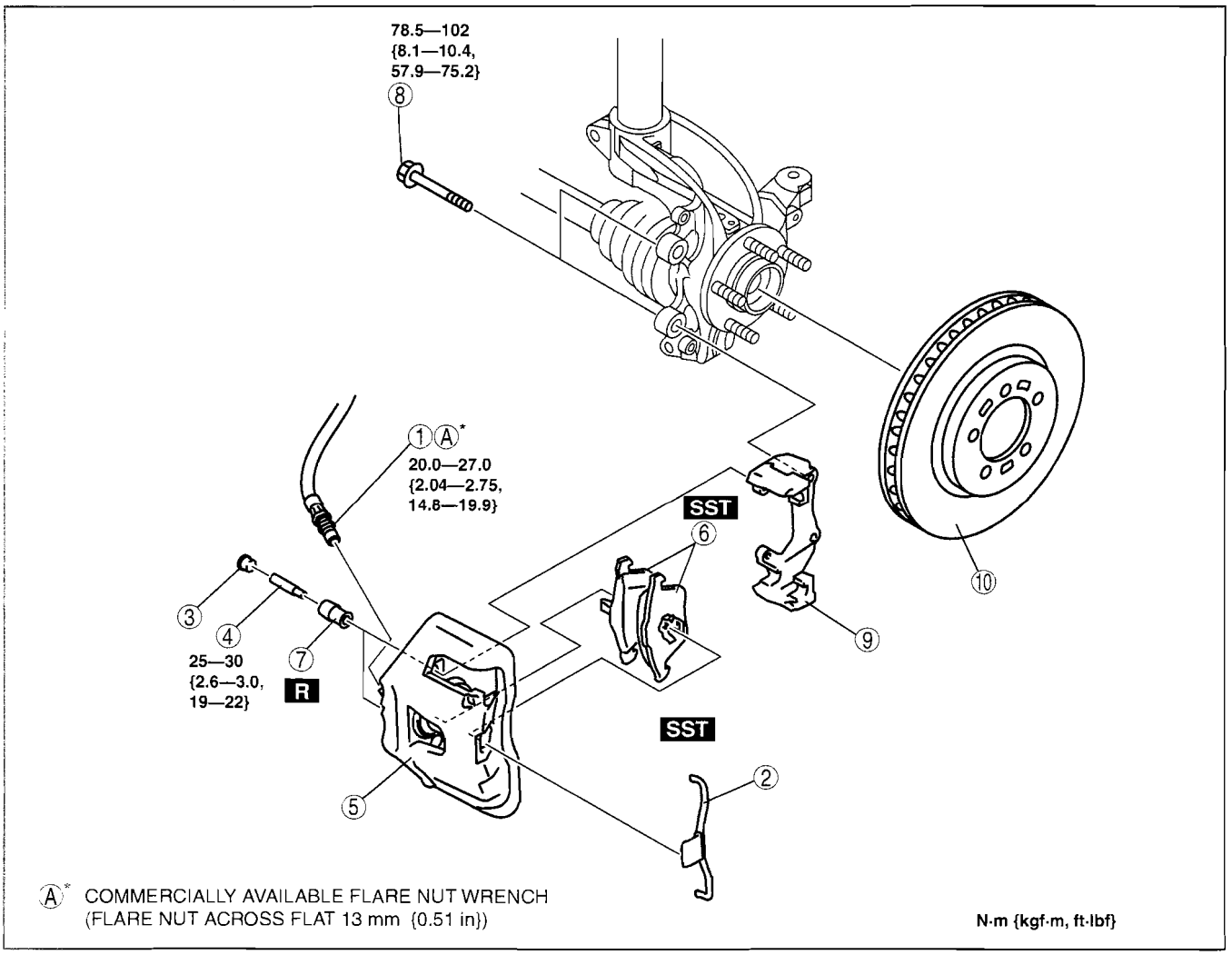


am3uuw0000091

FRONT BRAKE (DISC) REMOVAL/INSTALLATION[L3 WITH TC]

id041100800939

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



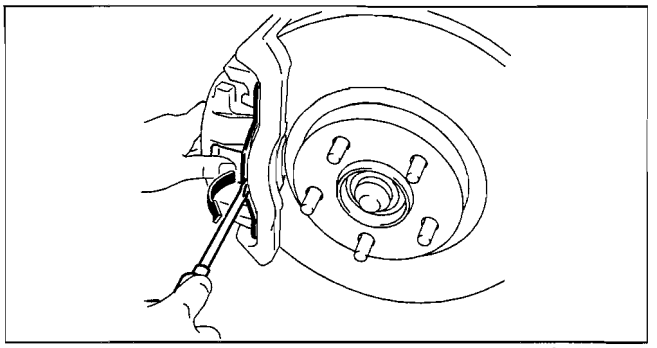
am3uuw0000037

1	Brake hose (See 04-11-20 Brake Hose Installation Note.)
2	Retaining clip (See 04-11-20 Retaining Clip Removal Note.)
3	Cap
4	Bolt
5	Caliper

6	Disc pad (See 04-11-20 Disc Pad Installation Note.)
7	Boot
8	Bolt
9	Mounting support
10	Disc plate

Retaining Clip Removal Note

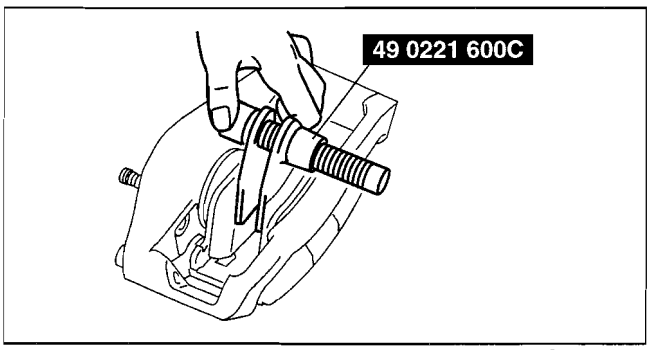
1. Move the retaining clip in the direction shown by the arrow using a flathead screwdriver and remove it from the caliper.



am3uuw0000037

Disc Pad Installation Note

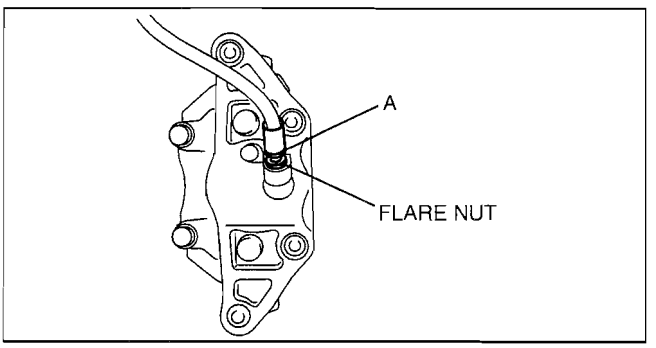
1. Clean the exposed area of the piston.
2. Push the piston in using the **SST**.
3. Install the disc pad to the caliper.



am3uuw0000037

Brake Hose Installation Note

1. Install the brake hose to the caliper.
2. Tighten the flare nut while holding the brake hose at point A with a spanner or equivalent.
3. Verify that the brake hose is not twisted.

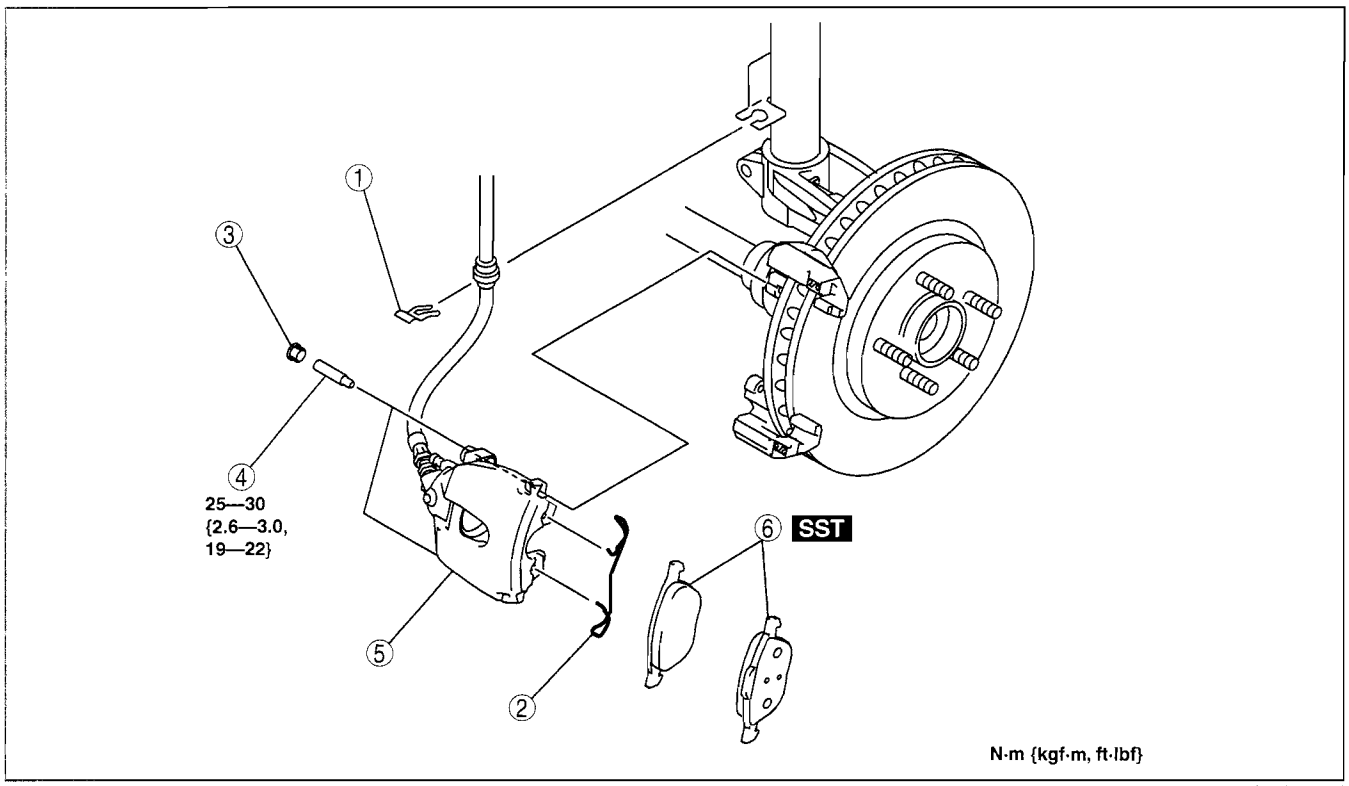


am3uuw0000037

DISC PAD (FRONT) REPLACEMENT[LF, L3]

id041100800738

1. Remove in the order indicated in the table.
2. install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



c3u0411w014

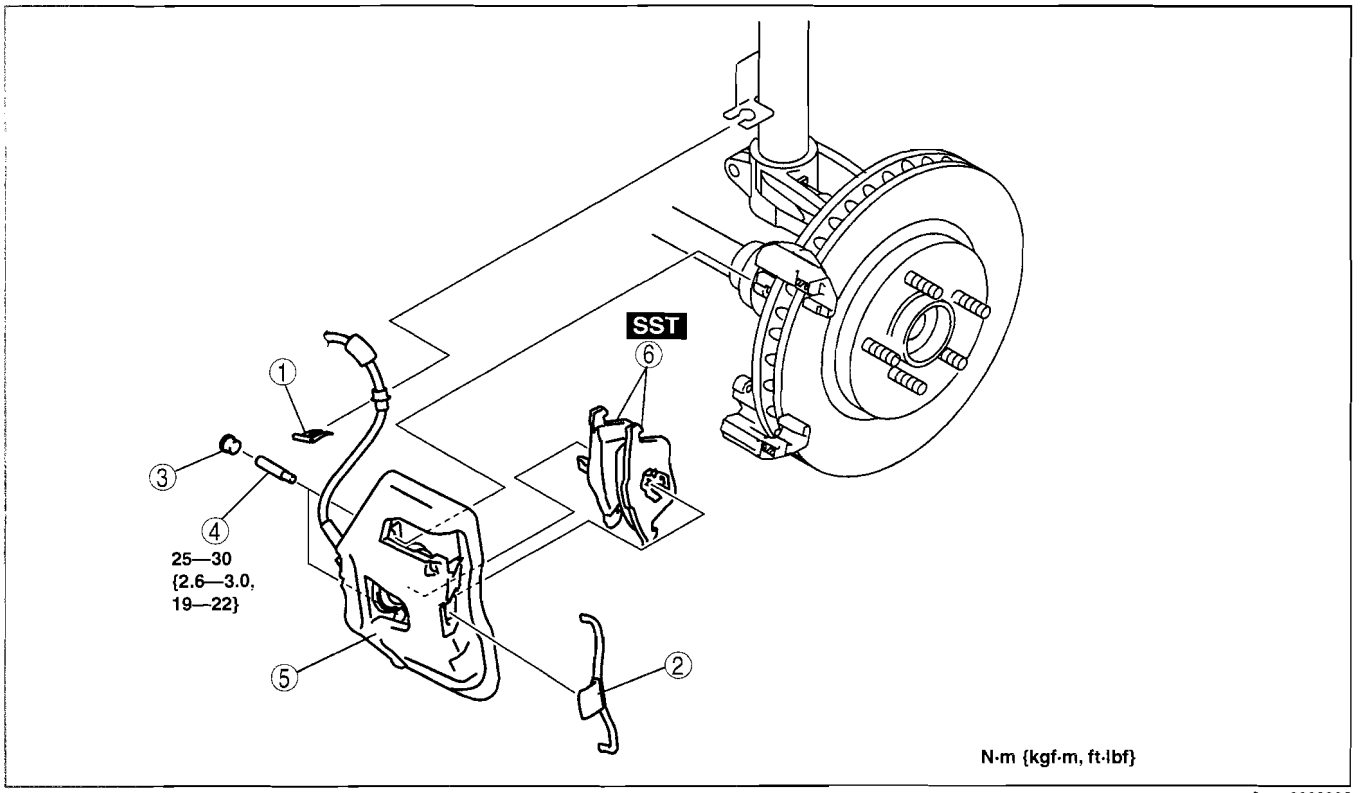
1	Clip
2	Retaining clip
3	Cap
4	Bolt

5	Caliper
6	Disc pad (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[LF, L3].)

DISC PAD (FRONT) REPLACEMENT[L3 WITH TC]

id041100800739

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



am3uuw0000036

1	Clip
2	Retaining clip (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[L3 WITH TC].)
3	Cap

4	Bolt
5	Caliper
6	Disc pad (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[L3 WITH TC].)

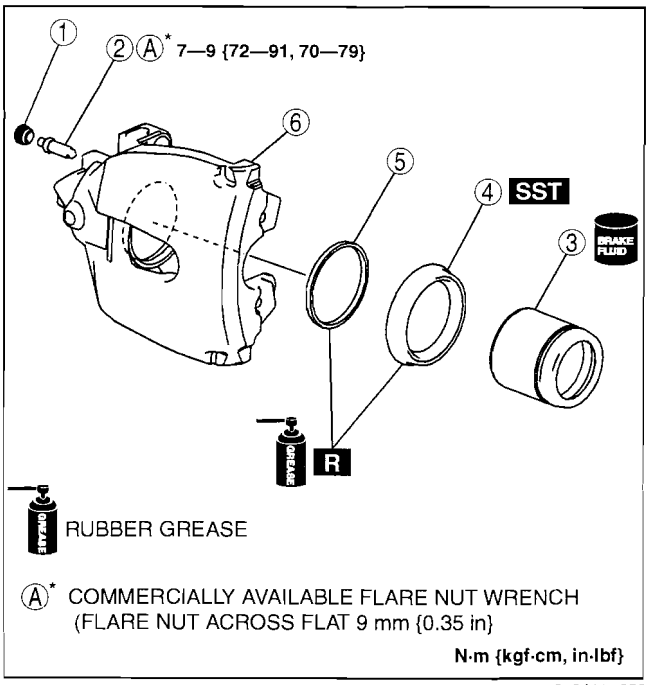
CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[LF, L3]

id041100801038

1. Disassemble in the order indicated in the table.

1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-23 Piston Disassembly Note.) (See 04-11-24 Piston Assembly Note.)
4	Dust seal (See 04-11-23 Dust Seal Assembly Note.)
5	Piston seal
6	Caliper body

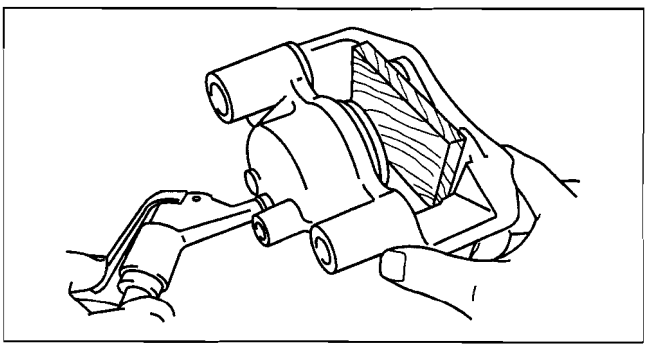
2. Assemble in the reverse order of disassembly.



c3u0411w052

Piston Disassembly Note

1. Insert a piece of wood in the caliper as shown in the figure and blow compressed air through the bleeder screw installation hole to remove the piston from the caliper body.



am3uuw0000037

Warning

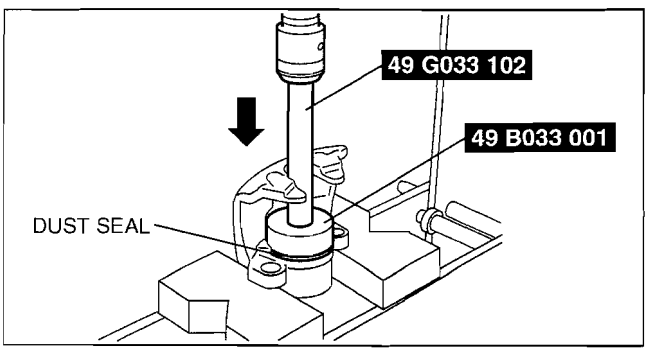
- **When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.**

Caution

- **The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.**

Dust Seal Assembly Note

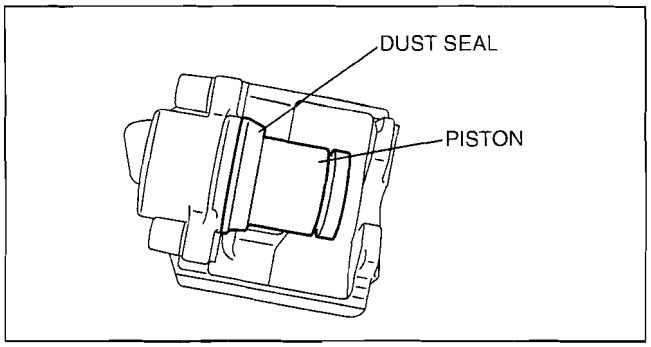
1. Assemble a new dust seal to the caliper using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**.
2. Verify that there is no gap between the dust seal and caliper body.



am3uuw0000037

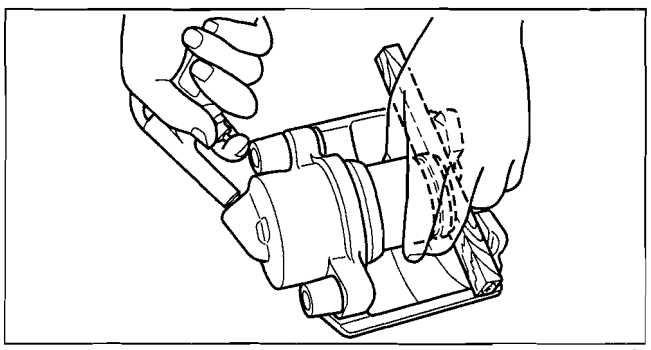
Piston Assembly Note

1. Press the piston into the dust seal opening as shown in the figure.



am3uuw0000037

2. Insert a piece of wood between the caliper body and the piston, and while supporting the piston by hand, blow compressed air through the brake hose installation hole.



am3uuw0000038

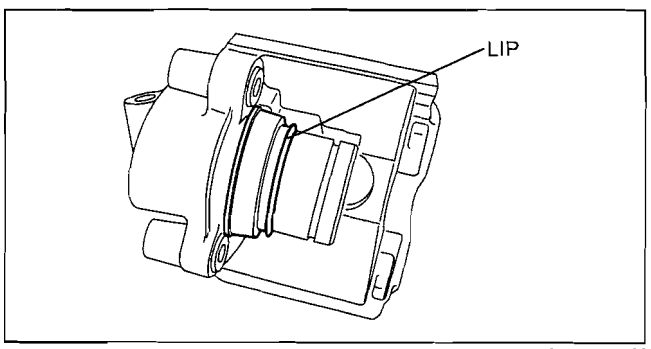
Warning

- **When blowing compressed air into the caliper body, the piston may pop out and cause injury if not supported at the correct point. Securely support the piston friction surface by hand when blowing compressed air.**

Note

- By blowing compressed air, the dust seal expands due to air pressure and covers the piston end.

3. Verify that the dust seal lip covers the piston end as shown in the figure.
4. Press the piston into the caliper body completely.



am3uuw0000038

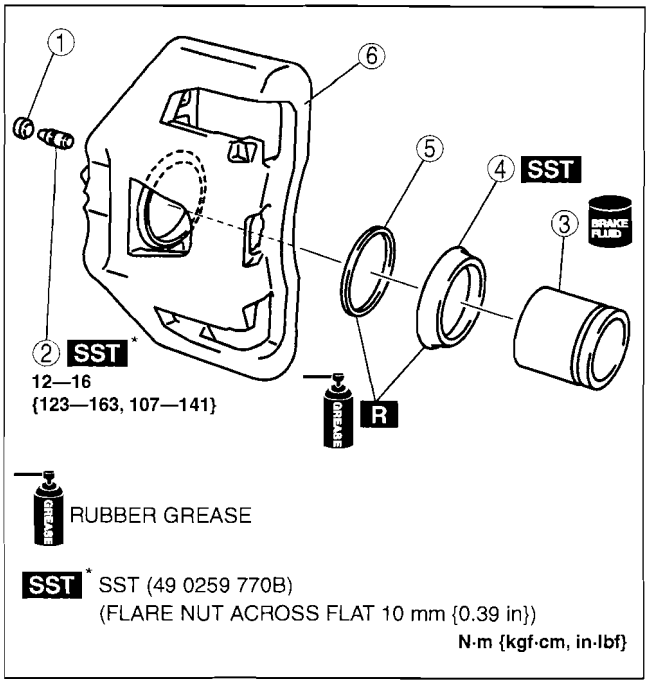
CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id041100801039

1. Disassemble in the order indicated in the table.

1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-25 Piston Disassembly Note.) (See 04-11-26 Piston Assembly Note.)
4	Dust seal (See 04-11-25 Dust Seal Assembly Note.)
5	Piston seal
6	Caliper body

2. Assemble in the reverse order of disassembly.

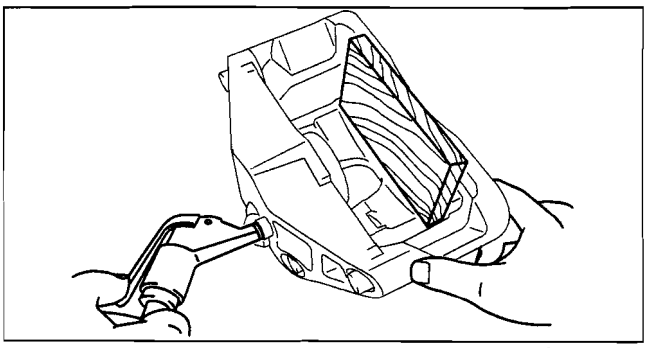


am3zzw0000347

04-11

Piston Disassembly Note

1. Insert a piece of wood in the caliper as shown in the figure and blow compressed air through the bleeder screw installation hole to remove the piston from the caliper body.



am3uuw0000038

Warning

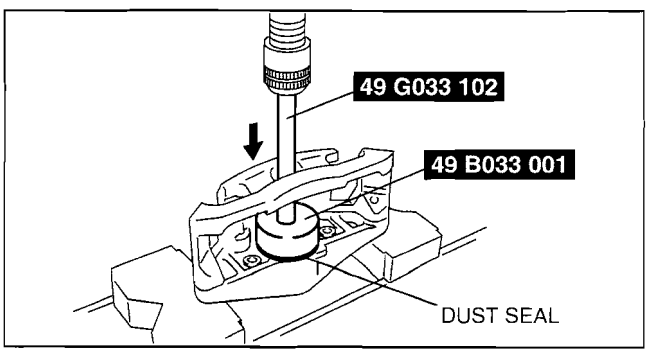
- **When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.**

Caution

- **The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.**

Dust Seal Assembly Note

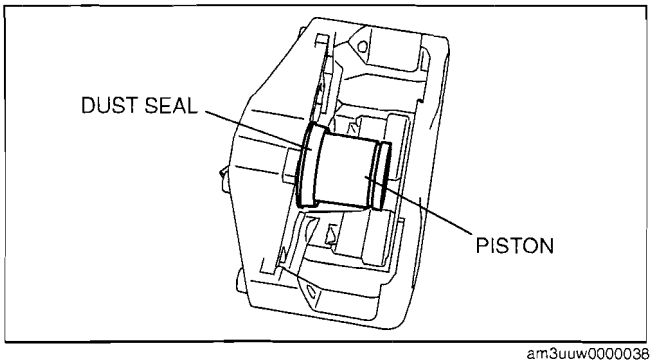
1. Assemble a new dust seal to the caliper using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**.
2. Verify that there is no gap between the dust seal and caliper body.



am3zzw0000347

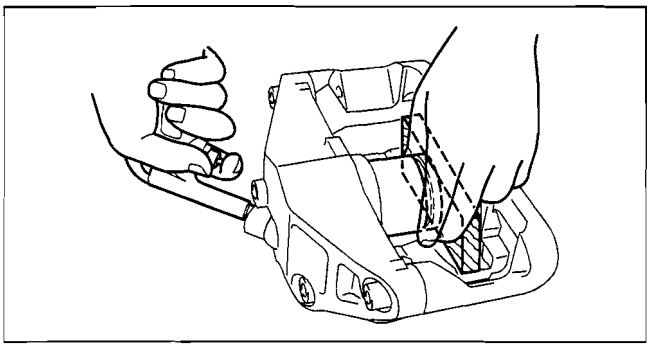
Piston Assembly Note

1. Press the piston into the dust seal opening as shown in the figure.



am3uuw0000038

2. Insert a piece of wood between the caliper body and the piston, and while supporting the piston by hand, blow compressed air through the brake hose installation hole.



am3uuw0000038

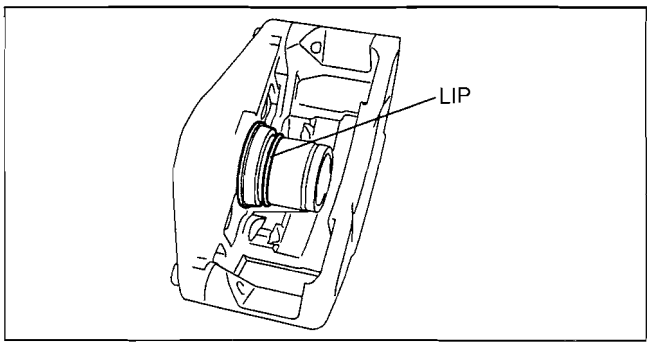
Warning

- **When blowing compressed air into the caliper body, the piston may pop out and cause injury if not supported at the correct point. Securely support the piston friction surface by hand when blowing compressed air.**

Note

- By blowing compressed air, the dust seal expands due to air pressure and covers the piston end.

3. Verify that the dust seal lip covers the piston end as shown in the figure.
4. Press the piston into the caliper body completely.



am3uuw0000038

REAR BRAKE (DISC) INSPECTION

id041100800400

Brake Judder Repair Hints

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. The steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

Brake pedal vibration

1. When applying the brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

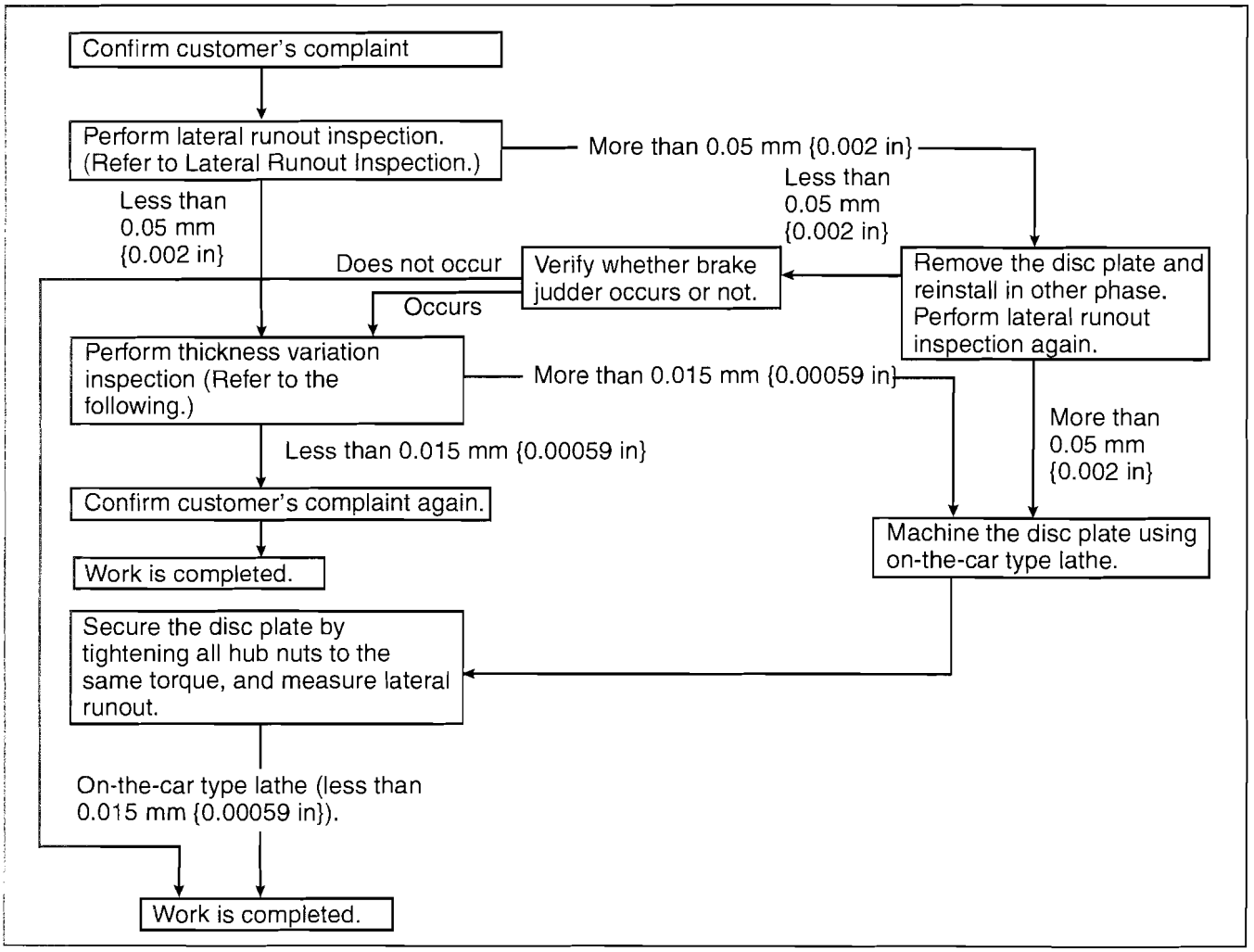
The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of the disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

Due to corrosion, the thickness and friction coefficient of the disc plate change.

1. If the vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of the disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



am3uuw0000074

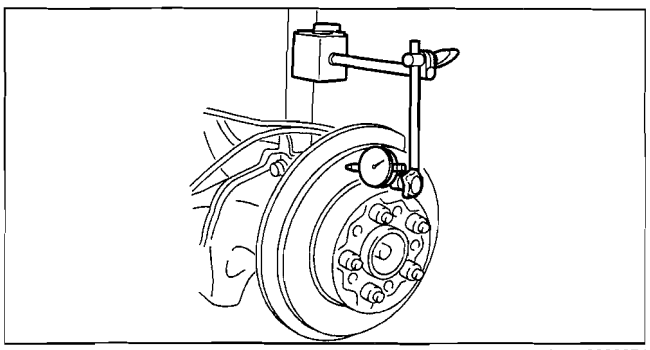
Lateral runout inspection

1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

Note
- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of the disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Rear disc plate runout limit
0.05 mm {0.002 in}

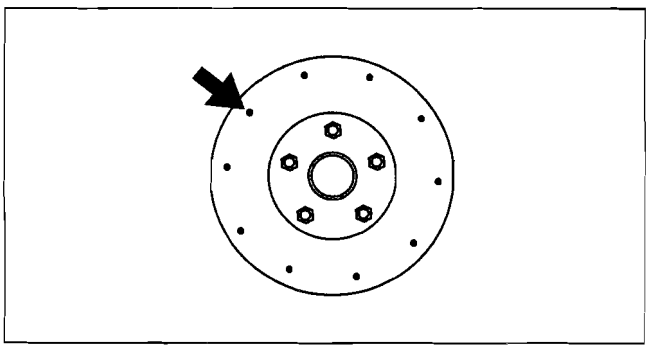

am3uuw0000074

Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within the specification, machine the disc plate using a lathe.

Thickness variation limit
0.015 mm {0.00059 in}

Warning
- **Do not exceed minimum disc plate thickness.**


am3uuw0000074

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

Minimum read disc plate thickness
9 mm {0.35 in}

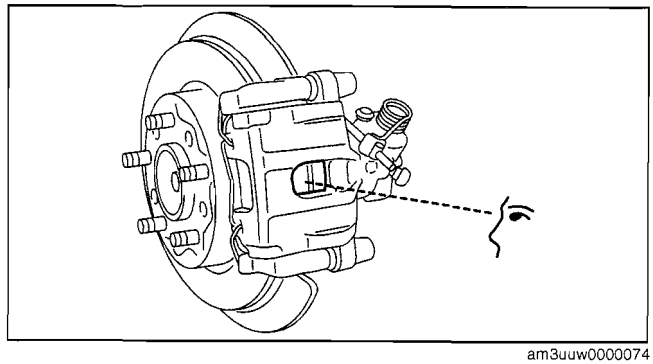
Minimum rear disc plate thickness after machining using a brake lathe on-vehicle
9.8 mm {0.39 in}

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Verify the remaining thickness of the pads.

Minimum rear disc pat thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.

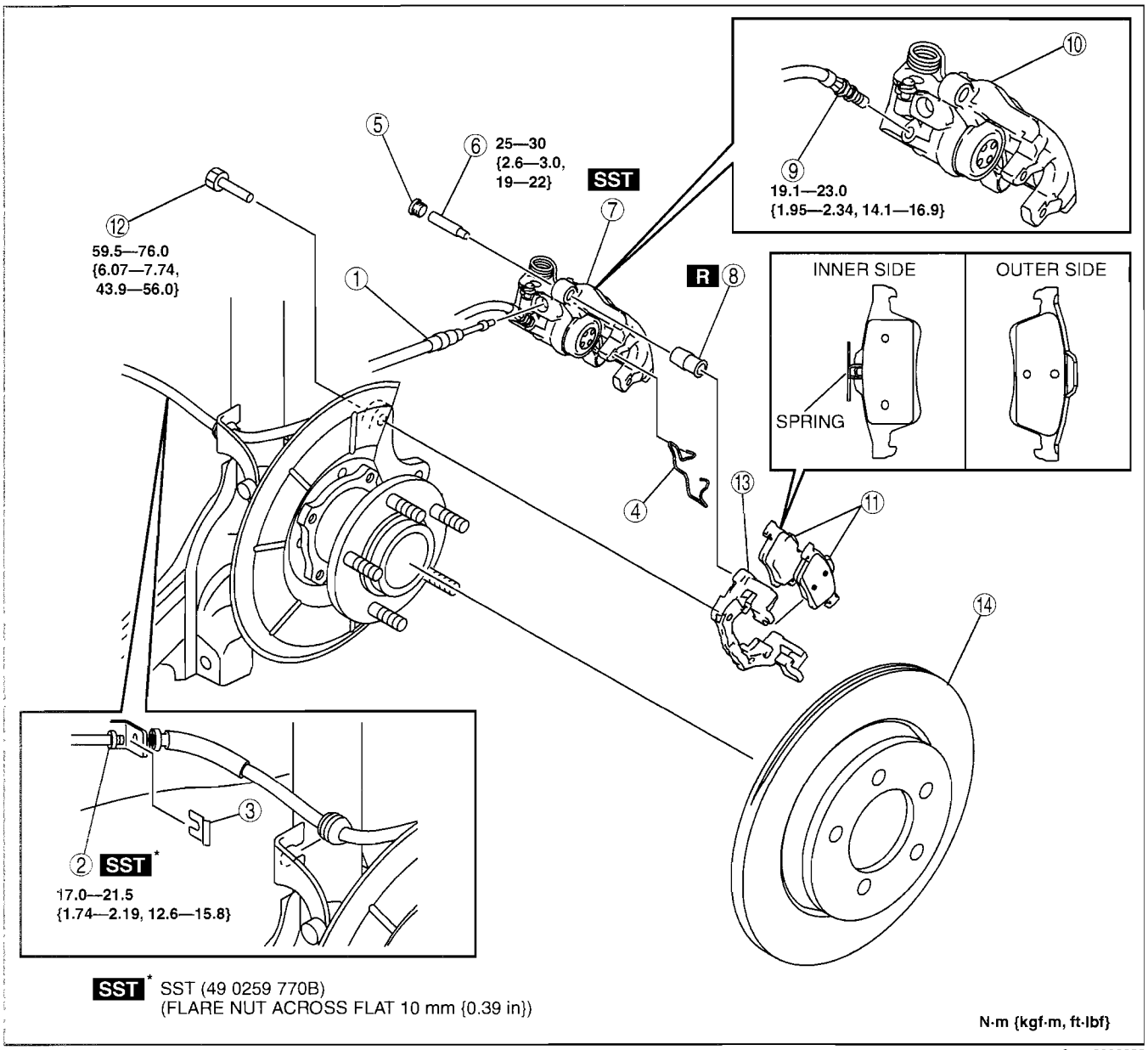


am3uuw0000074

REAR BRAKE (DISC) REMOVAL/INSTALLATION

id041100800500

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and inspect the following:
   — Parking brake lever stroke
   — Brake drag



am3zzw0000259

1	Parking brake cable
2	Brake pipe
3	Clip
4	Retaining clip
5	Cap
6	Bolt
7	Caliper, brake hose (See 04-11-31 Caliper, Brake Hose Installation Note.)

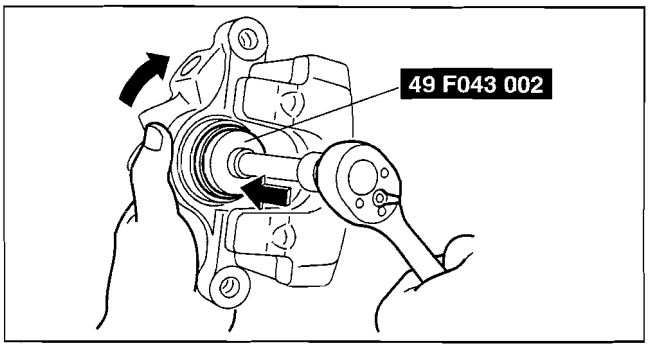
8	Boot
9	Brake hose
10	Caliper
11	Disc pad
12	Bolt
13	Mounting support
14	Disc plate

Caliper, Brake Hose Installation Note

1. Clean the exposed area of the piston.
2. Slowly rotate the piston clockwise while firmly pushing it to the caliper body using the **SST** and push the piston completely into the caliper body.

Warning

- **If the SST comes off the piston, it may cause other parts to crush against your hand causing injury. Be careful that the SST remains firmly connected to the piston when you push the piston into the caliper body.**



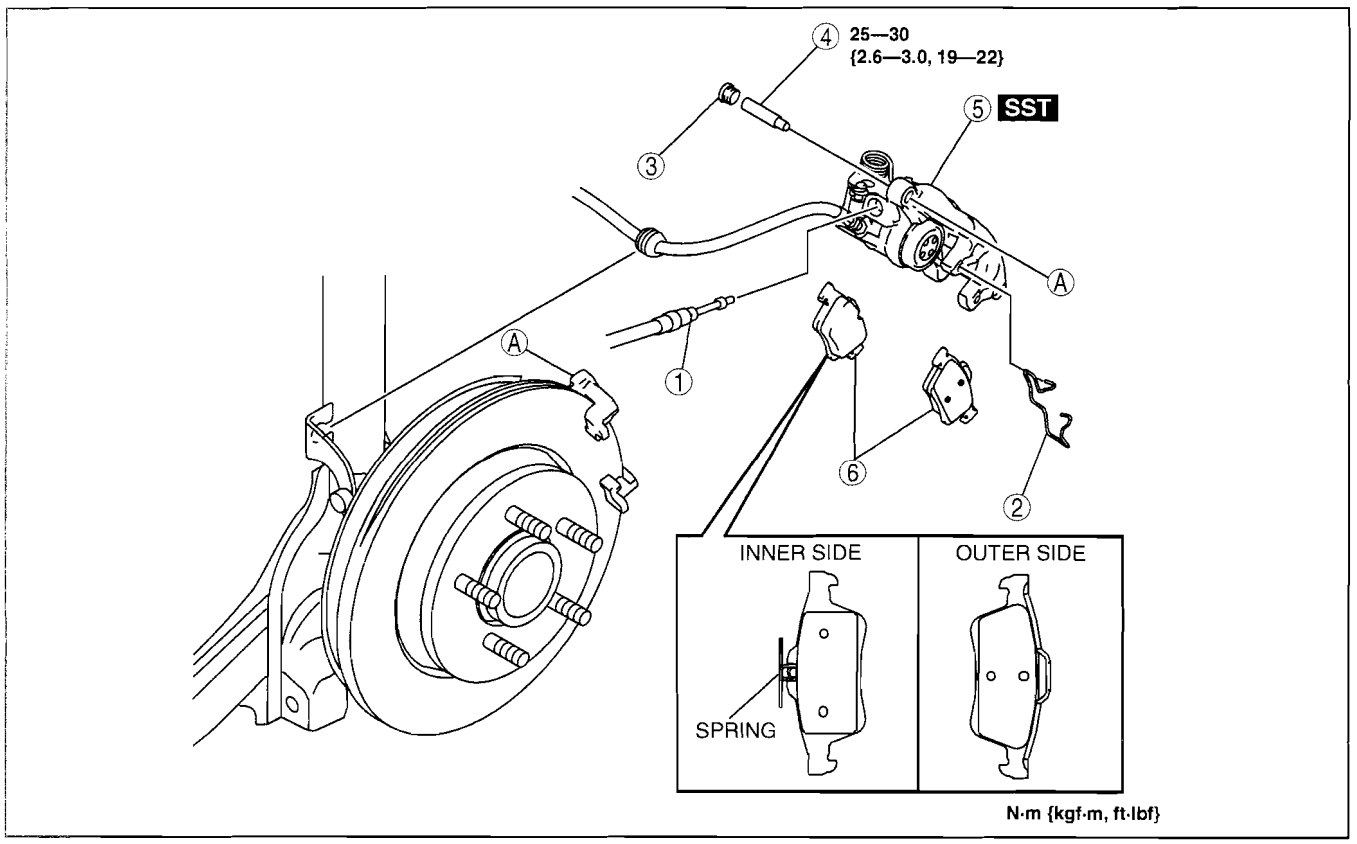
am3uuw0000088

3. Install the the caliper, brake hose.

DISC PAD (REAR) REPLACEMENT

id041100800300

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and inspect the following:
   — Parking brake lever stroke
   — Brake drag



am3zzw0000259

1	Parking brake cable
2	Retaining clip
3	Cap
4	Bolt

5	Caliper (See 04-11-30 REAR BRAKE (DISC) REMOVAL/ INSTALLATION.)
6	Disc pad

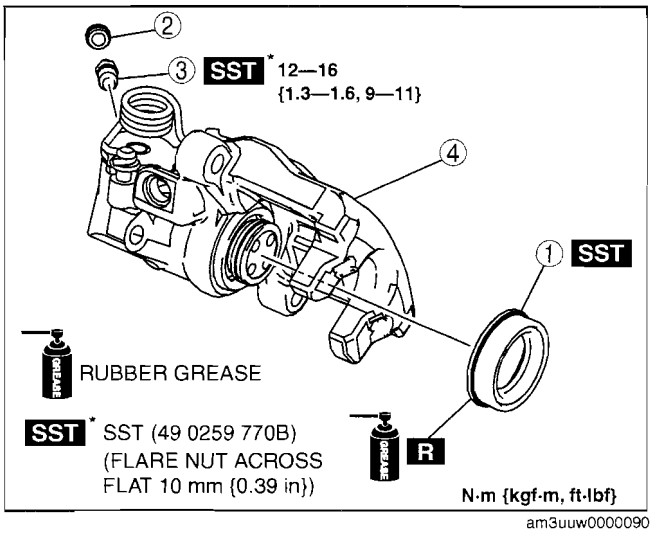
CALIPER (REAR) DISASSEMBLY/ASSEMBLY

id041100800600

1. Disassemble in the order indicated in the table.

1	Dust seal (See 04-11-32 Dust Seal Assembly Note.)
2	Bleeder cap
3	Bleeder screw
4	Caliper body

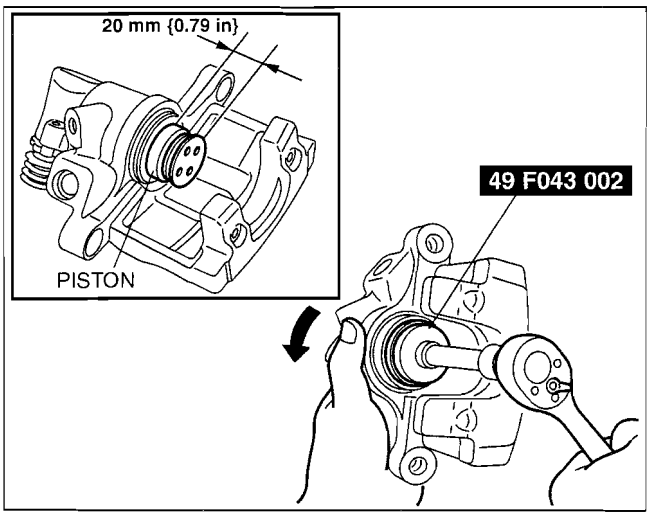
2. Assemble in the reverse order of disassembly.



am3uuw0000090

Dust Seal Assembly Note

1. While rotating the piston counterclockwise using the **SST**, pull it out to the position shown in the figure.

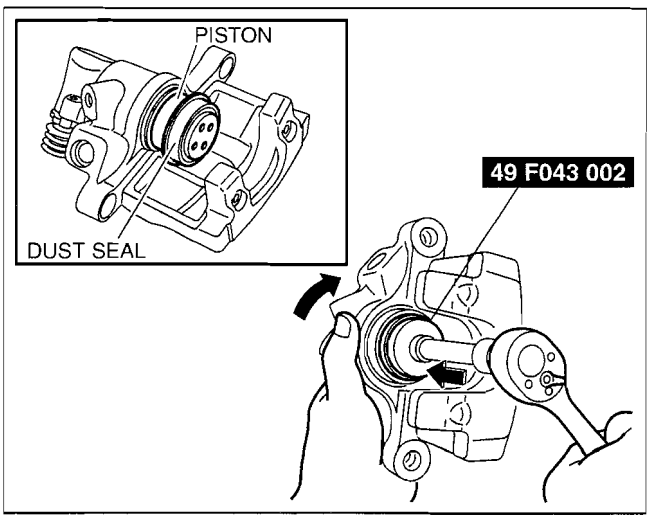


am3uuw0000091

2. As shown in the figure, assemble a new dust seal to the piston and slowly rotate the piston clockwise while pushing it to the caliper body using SST to push the piston completely into the caliper body.

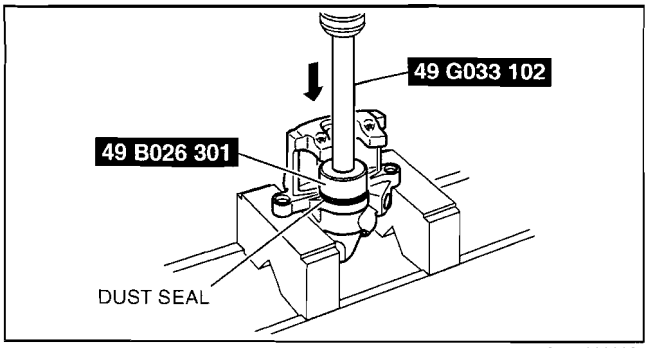
Warning

- **If the SST comes off the piston, it may cause other parts to crush against your hand causing injury. Be careful that the SST remains firmly connected to the piston when you push the piston into the caliper body.**



am3uuw0000091

3. Assemble the dust seal to the caliper body using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**
4. Verify that there is no gap between the dust seal and caliper body.

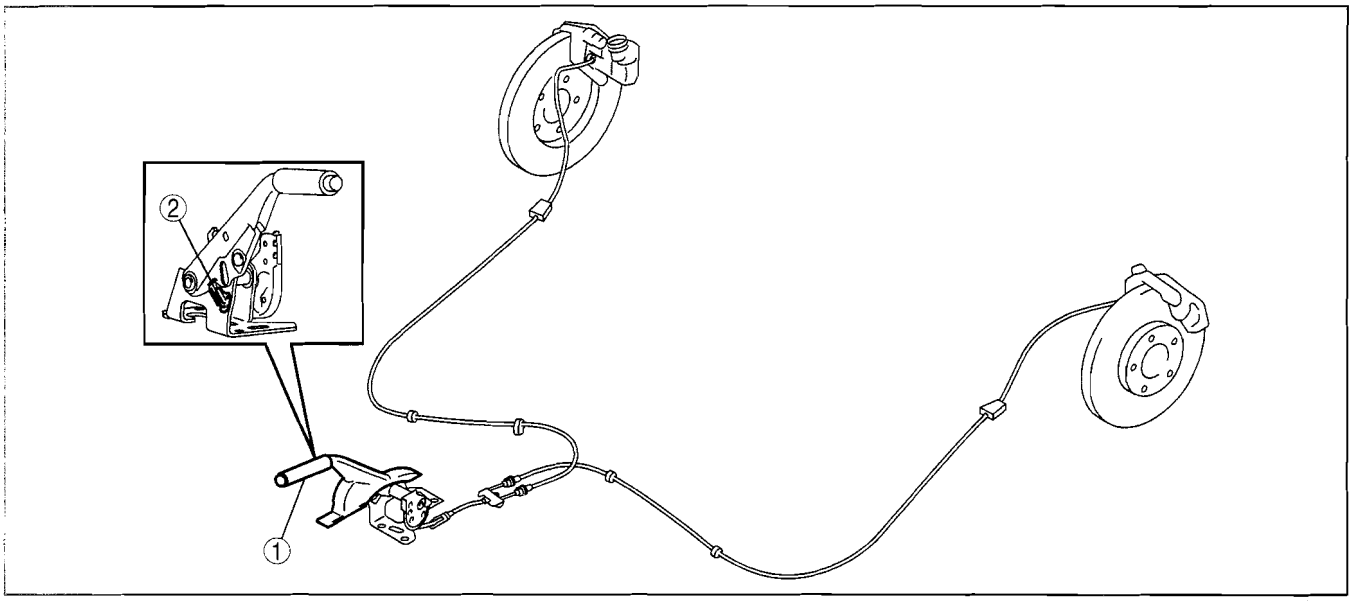


am3uuw0000091

04-12 PARKING BRAKE SYSTEM

PARKING BRAKE SYSTEM LOCATION INDEX

id041200800100



C3U0412W002

1	Parking brake lever (See 04-12-2 PARKING BRAKE LEVER INSPECTION.) (See 04-12-2 PARKING BRAKE LEVER ADJUSTMENT.) (See 04-12-2 PARKING BRAKE LEVER REMOVAL/INSTALLATION.)
2	Parking brake switch (See 04-12-4 PARKING BRAKE SWITCH INSPECTION.)

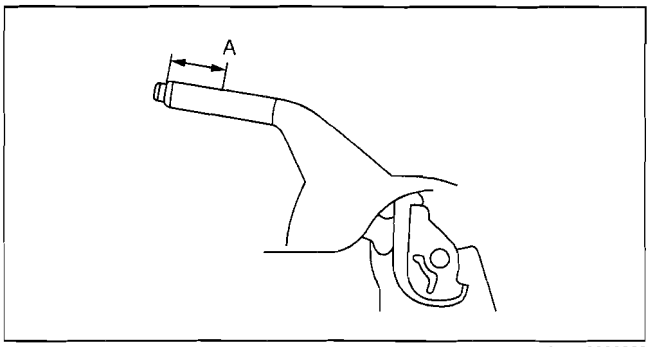
PARKING BRAKE LEVER INSPECTION

id041200800900

Stroke Inspection

1. Pump the brake pedal a few times.
2. Pull the parking brake lever two to three times.
3. Inspect the parking brake stroke by slowly pulling at point A **50 mm {1.97 in}** from the end of the parking brake lever with a force of **98 N {10 kgf, 22 lbf}** and counting the number of notches (clicking sound).
   - If not within the specification, adjust the parking brake lever.

Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}
3—7 notches

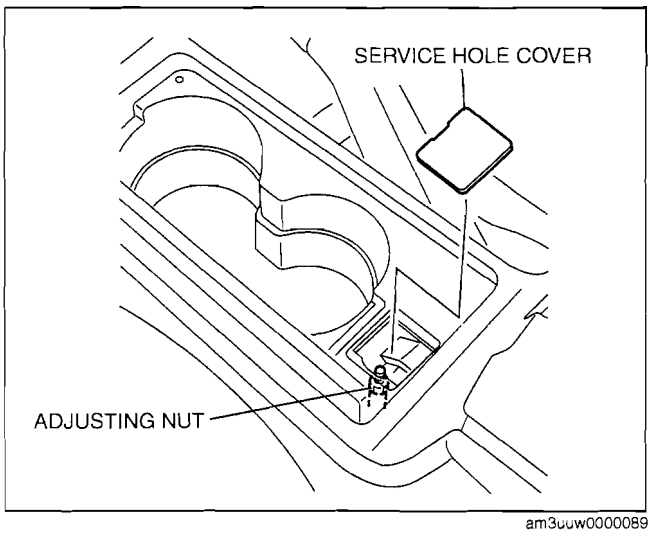


am3uuw0000028

PARKING BRAKE LEVER ADJUSTMENT

id041200801500

1. Pump the brake pedal a few times.
2. Remove the service hole cover of the rear console.
3. Turn the adjusting nut and adjust the parking brake lever.
4. After adjustment, pull the parking brake lever one notch and verify that the parking brake warning light illuminates.
5. Verify that the rear brakes do not drag.



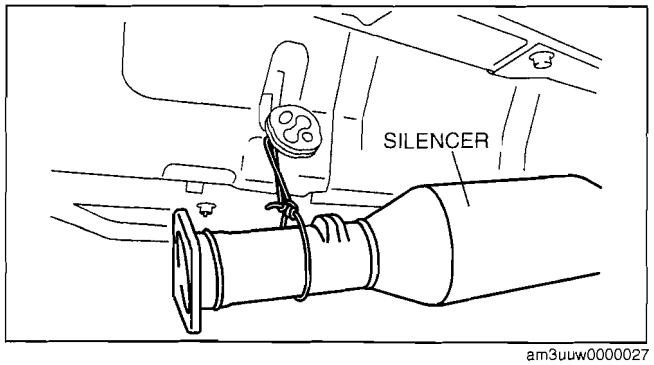
am3uuw0000089

PARKING BRAKE LEVER REMOVAL/INSTALLATION

id041200801600

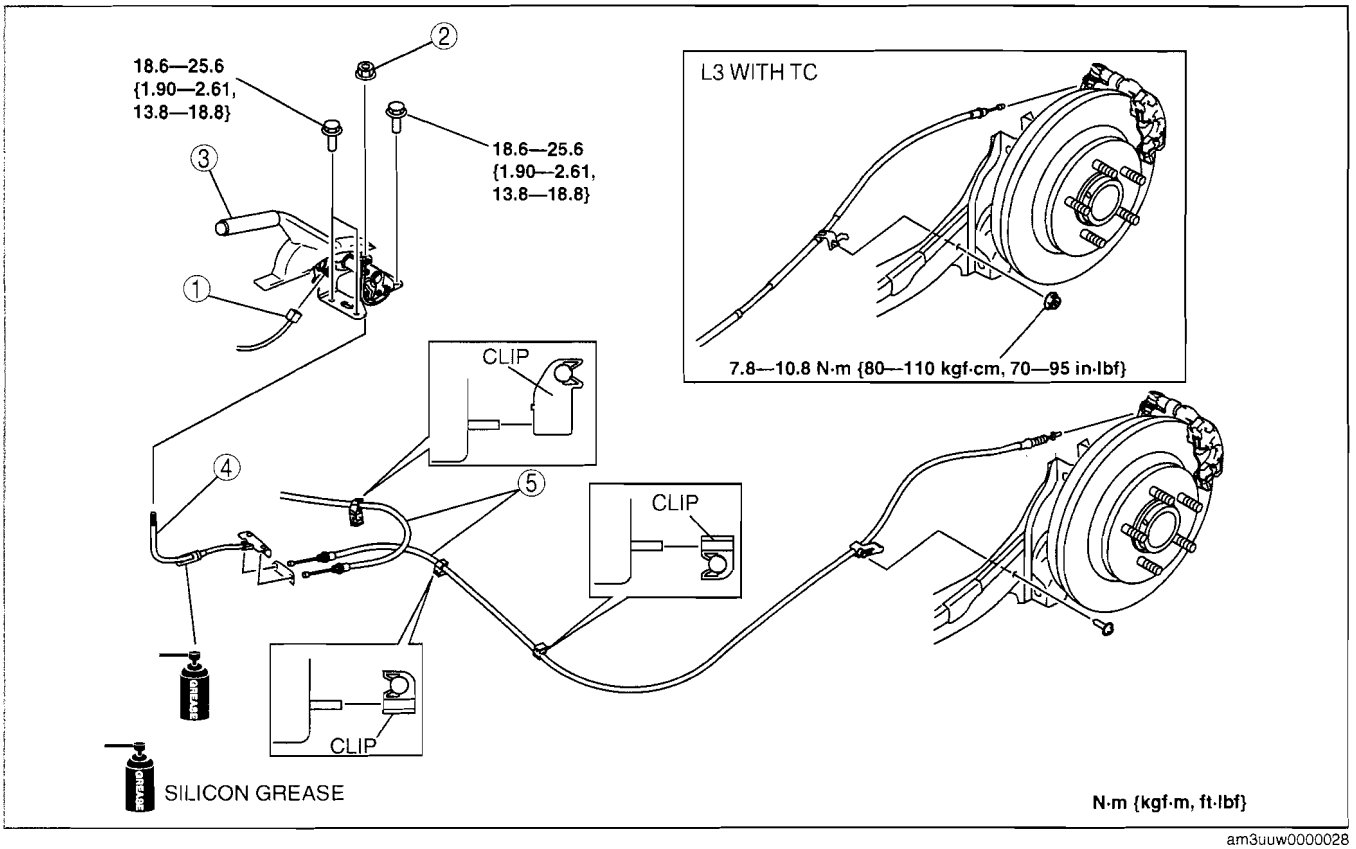
1. To remove the front and rear parking brake cables, perform the following and remove the heat insulator.
   LF, L3
   1. Remove the main silencer. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   2. Remove the heat insulator.

   L3 WITH TC
   1. Remove the member. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   2. Remove the silencer installation nuts. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   3. Disconnect the hanger rubber except for the one installed to the rear end of the vehicle from the silencer, and suspend the silencer using rope.
   4. Remove the heat insulator.
2. To remove the parking brake lever and front parking brake cable, remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



am3uuw0000027

5. After installation, inspect the parking brake lever stroke. (See 04-12-2 PARKING BRAKE LEVER INSPECTION.)

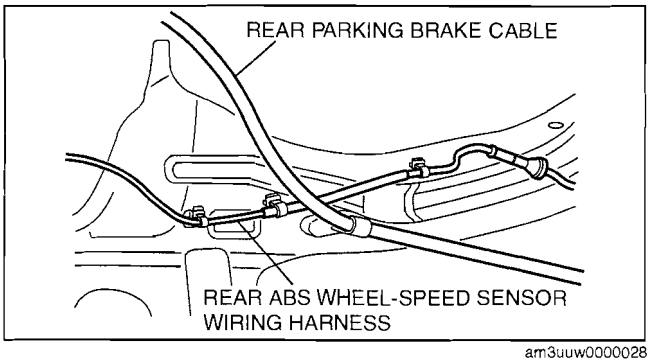


am3uuw0000028

1	Parking brake switch connector
2	Adjusting nut
3	Parking brake lever
4	Front parking brake cable (See 04-12-4 Front Parking Brake Cable Installation Note.)
5	Rear parking brake cable (See 04-12-3 Rear Parking Brake Cable Installation Note.)

Rear Parking Brake Cable Installation Note

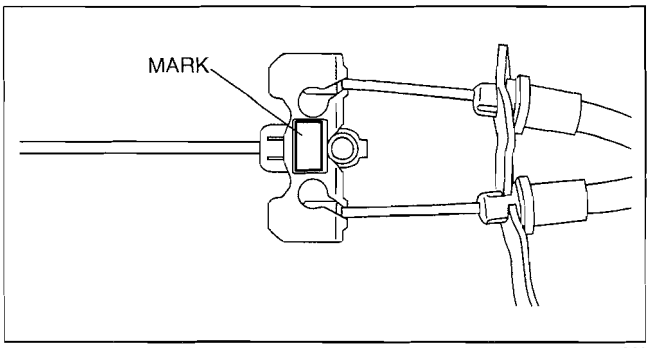
1. Pass the rear parking brake cable inside the rear ABS wheel-speed sensor wiring harness as shown in the figure.
2. Install the rear parking brake cable.



am3uuw0000028

Front Parking Brake Cable Installation Note

1. Install the front parking brake cable with the mark on the equalizer facing toward the vehicle downside.

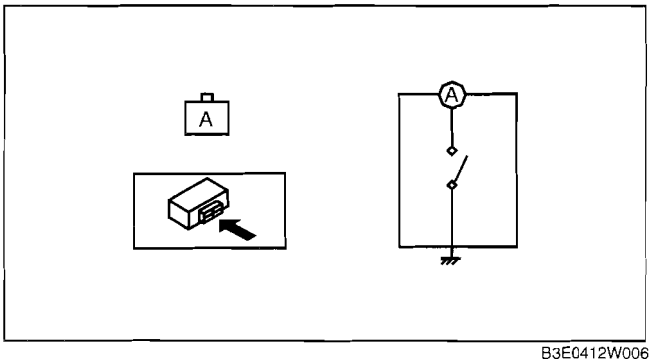


am3uuw0000028

PARKING BRAKE SWITCH INSPECTION

id041200800700

1. Disconnect the parking brake switch connector.
2. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the parking brake lever.



B3E0412W006

O—O: Continuity

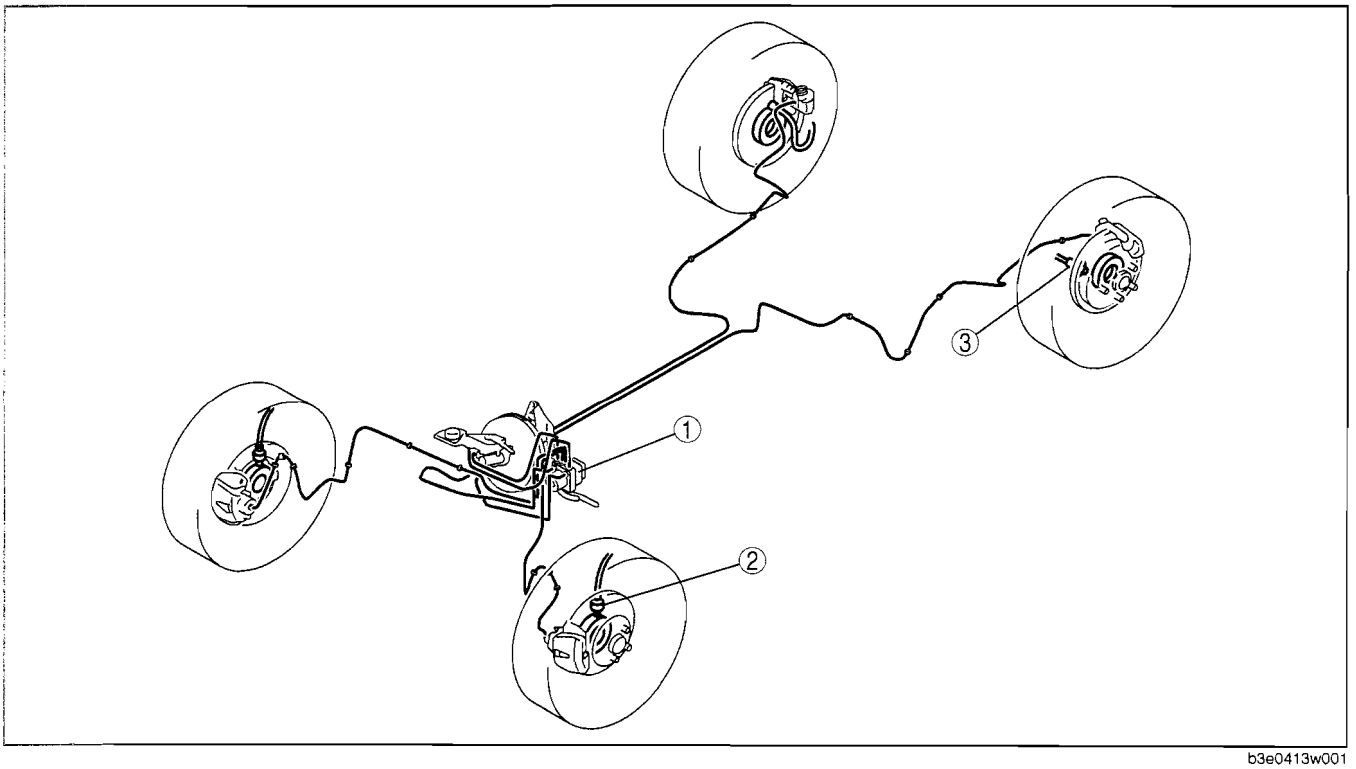
Condition	Terminal	
	A	Body ground
Parking brake lever pulled	O	O
Parking brake lever released		

CHU0412W003

04-13 ANTILOCK BRAKE SYSTEM

ABS LOCATION INDEX

id041300801100



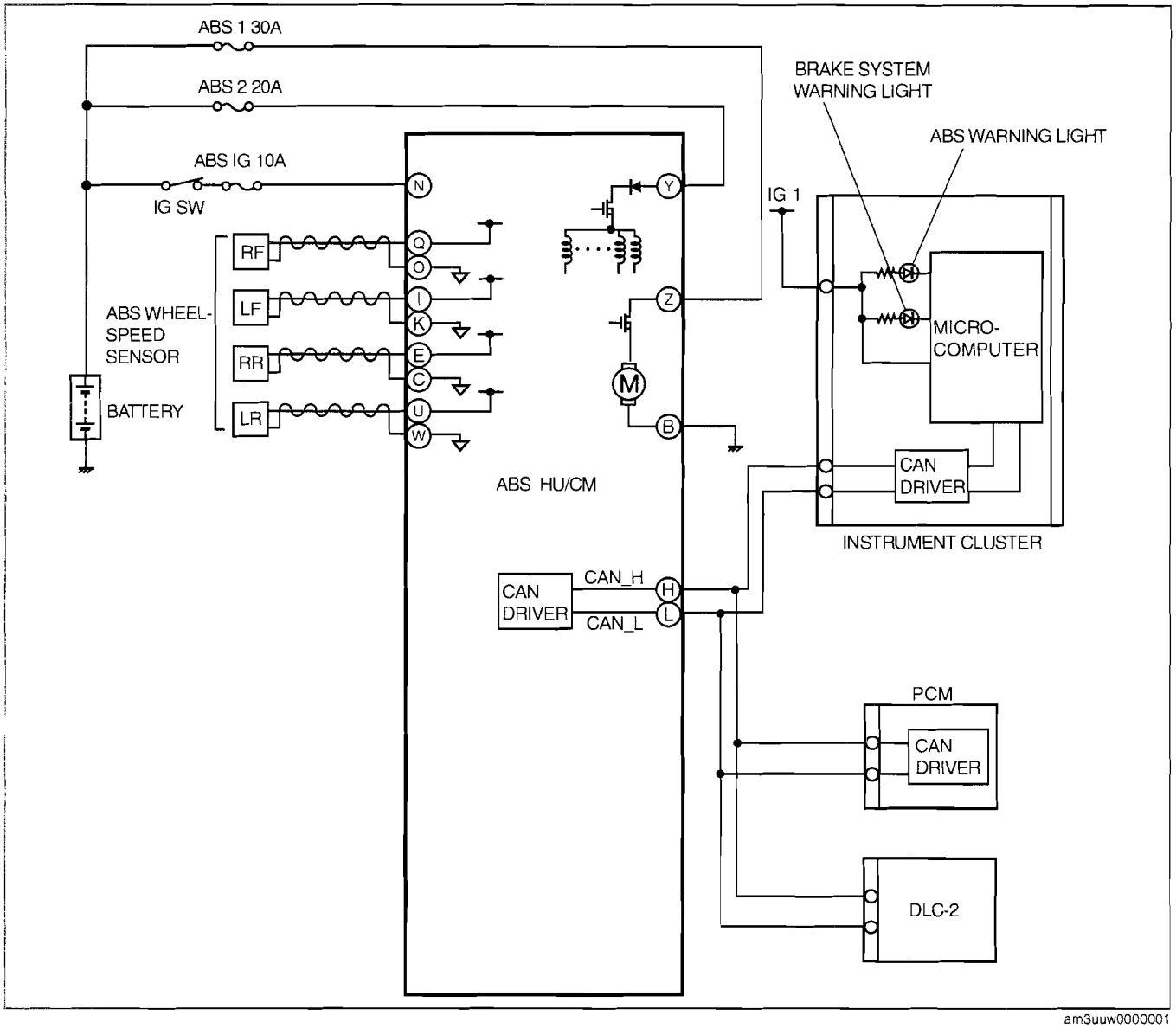
b3e0413w001

1	ABS HU/CM (See 04-13-2 ABS SYSTEM INSPECTION.) (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.) (See 04-13-6 ABS CONFIGURATION.) (See 04-13-6 ABS HU/CM INSPECTION.)

2	Front ABS wheel-speed sensor (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)
3	Rear ABS wheel-speed sensor (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)

ABS SYSTEM WIRING DIAGRAM

id041300805000



am3uuw0000001

ABS SYSTEM INSPECTION

id041300800200

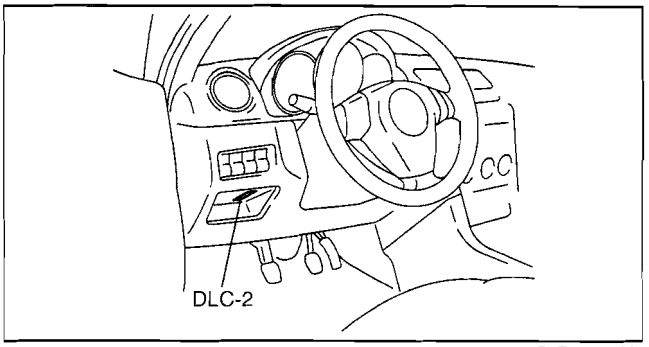
ABS Hydraulic Unit On-vehicle Inspection

Preparation

1. Verify that the battery is fully charged.
2. Turn the ignition switch to the ON position and verify that the ABS warning light goes out after **approx. 3.0 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to neutral.
6. Release the parking brake.
7. Verify that all four wheels rotate.
8. Rotate the inspected wheels by hand and verify there is no brake drag.
   - If there is any brake drag, perform regular brake inspection.
   - If there is no brake drag, perform ABS HU/CM operation inspection.

Operation inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below.



B3E0102W003

Operation condition	Command name			Command transmission type
	PMP_MOTOR	RF_OUTLET	RF_INLET	
Brake pressure retention	OFF	OFF	ON	Manual
Brake pressure reduction	ON	ON	ON	

The chart above shows an example of a right front wheel inspection.

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the ABS HU/CM.**

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.
5. Performing the inspection above determines the following:
   - The ABS HU/CM brake lines are normal.
   - The ABS HU/CM hydraulic system is not significantly abnormal (including inside ABS HU/CM).
   - The ABS HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
   - The ABS HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
     - — However, the following items cannot be verified.
       - Malfunction of ABS HU/CM input system wiring harnesses and parts
       - Extremely small leakage in the ABS HU/CM internal hydraulic system
       - Intermittent malfunction of the above items

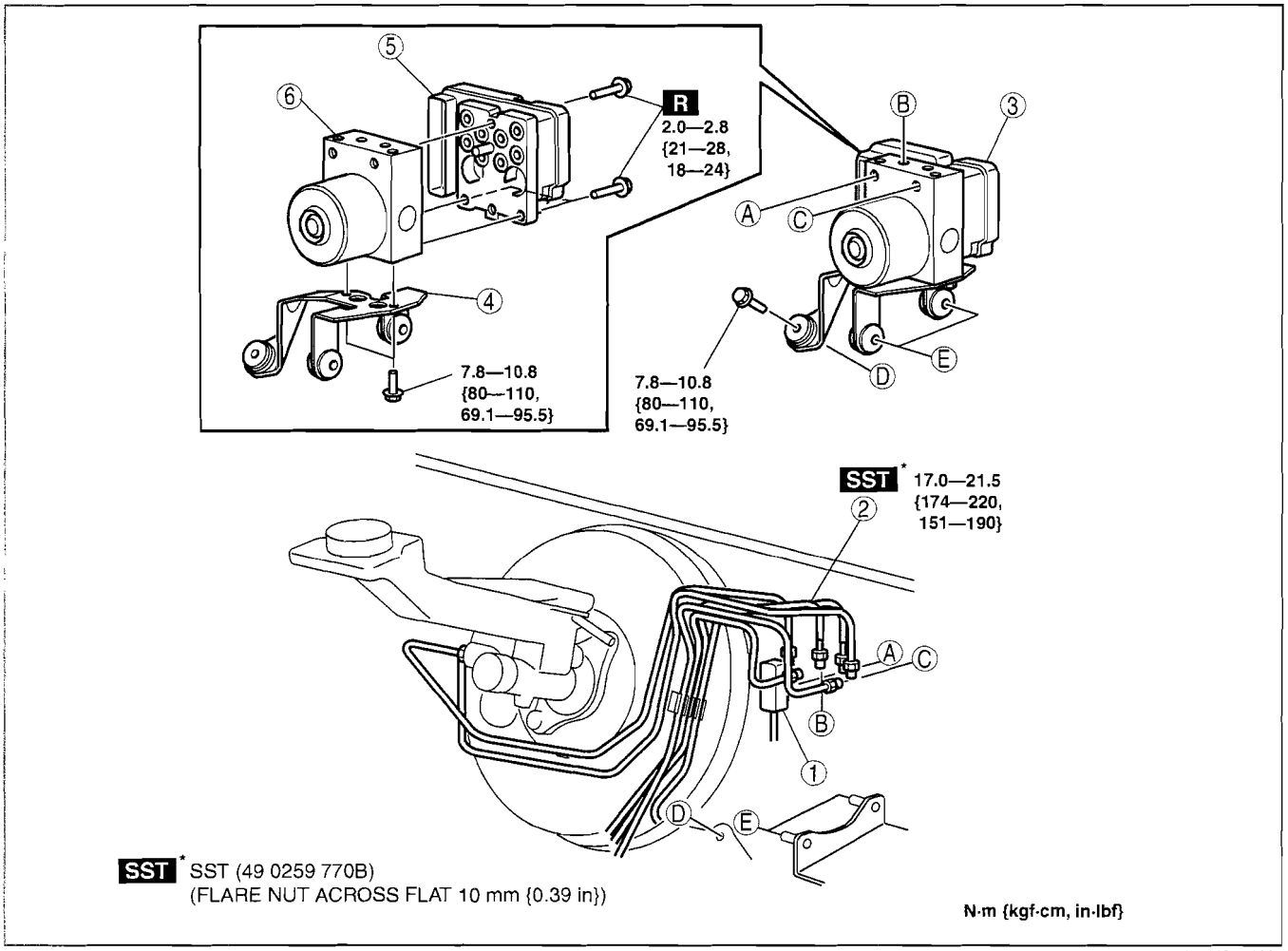
ABS HU/CM REMOVAL/INSTALLATION

id041300801400

Caution

- **When replacing the ABS HU/CM, the configuration procedure must be done before removing the ABS HU/CM. If the configuration is not completed before removing the ABS HU/CM, ABS will not work properly after installation of the ABS HU/CM.**
- **Do not separate the ABS HU and ABS CM unless replacing them, otherwise the ABS HU/CM may not function properly. When replacing them with new ones, always perform procedures according to the instructions included with the new parts.**
- **The internal parts of the ABS HU/CM could be damaged if dropped. Be careful not to drop the ABS HU/CM. Replace the ABS HU/CM if it is subjected to an impact.**

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the reserve hose. (MTX) (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].) (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Configurate the ABS HU/CM (only when replacing it). (See 04-13-6 ABS CONFIGURATION.)



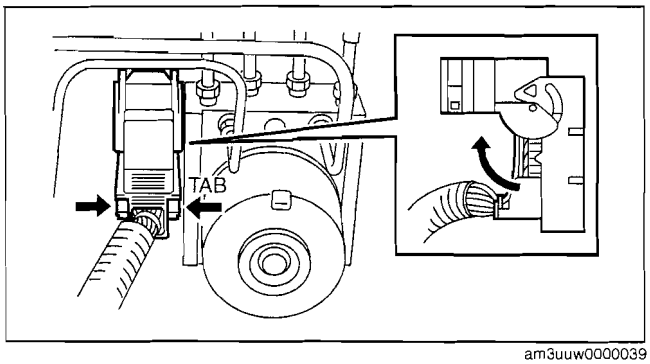
d3u413zw6001

1	Connector (See 04-13-5 Connector Removal Note.) (See 04-13-6 Connector Installation Note.)
2	Brake pipe (See 04-13-5 Brake Pipe Removal Note.) (See 04-13-5 Brake Pipe Installation Note.)

3	ABS HU/CM component, bracket (See 04-13-5 ABS HU/CM Component, Bracket Removal Note.)
4	Bracket
5	ABS CM
6	ABS HU

Connector Removal Note

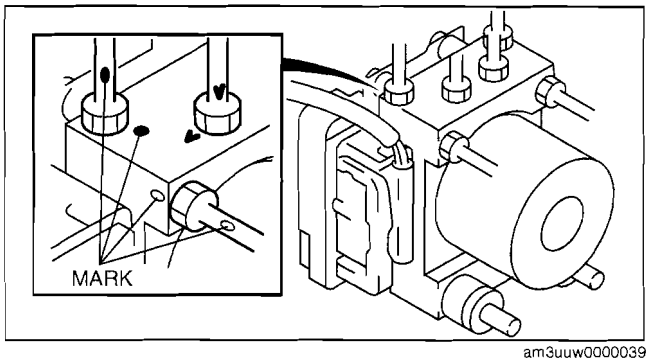
1. Pull the connector cover up in the direction of the arrow while pressing the tab of the connector cover.
2. Pull the connector toward the vehicle front and remove it.



am3uuw0000039

Brake Pipe Removal Note

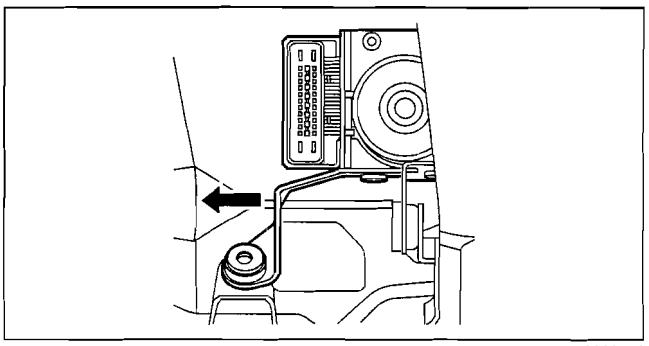
1. Place an alignment mark on the brake pipe and ABS HU/CM.
2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.



am3uuw0000039

ABS HU/CM Component, Bracket Removal Note

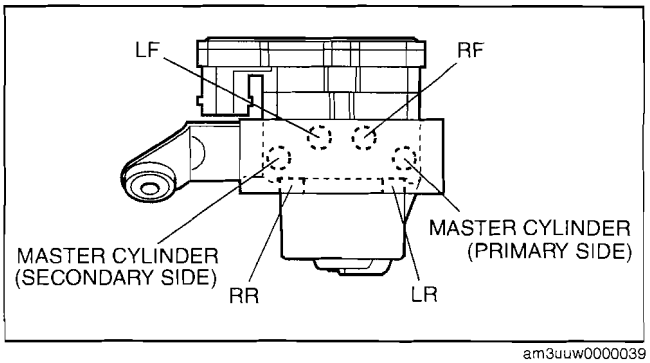
1. As shown in the figure, move the bracket in the direction of the arrow and remove the ABS HU/CM component and bracket from the body.



am3uuw0000039

Brake Pipe Installation Note

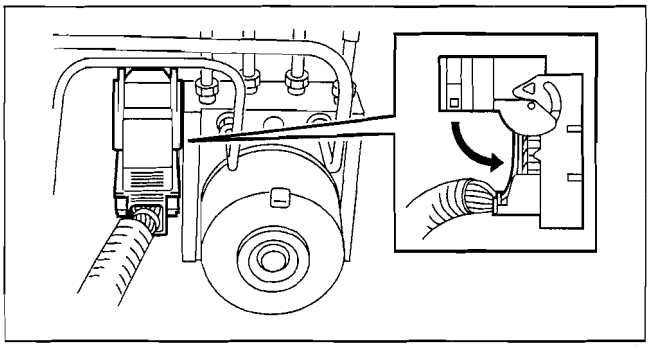
1. Align the marks made before removal and install the brake pipe to the ABS HU/CM referring to the figure.



am3uuw0000039

Connector Installation Note

1. After connecting the connector, verify that the connector cover is completely pushed in.

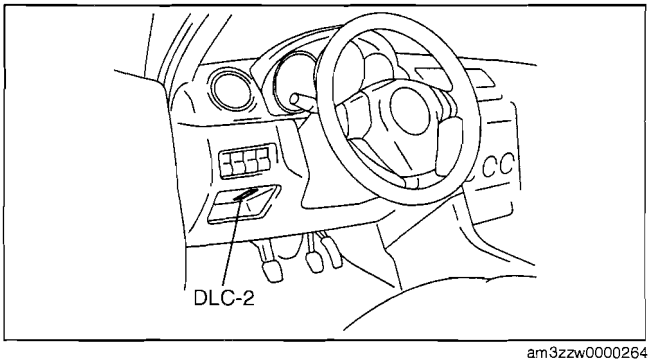


am3uuw0000039

ABS CONFIGURATION

id041300802000

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module Programming".
3. Then, select the "Programmable Module Installation" and "ABS" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)



am3zzw0000264

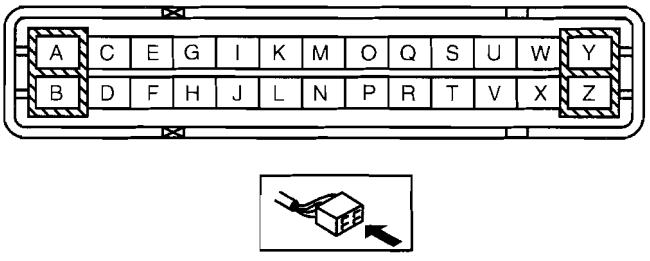
ABS HU/CM INSPECTION

id041300801000

1. Disconnect the ABS HU/CM connector.
2. Connect the negative battery cable.
3. Attach the tester lead to the ABS HU/CM wiring harness-side connector, then inspect the voltage, continuity, or resistance according to the standard (reference) on the table.

Terminal Voltage Table (Reference)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



B3E0413W010

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
A	—	—	—	—	—	—
B	Ground (ABS motor)	Ground point	Continuity	B—ground point	Continuity detected	• Wiring harness (B—ground point)
C	RR wheel-speed (ground)	RR ABS wheel-speed sensor	Continuity	C—RR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (C—RR ABS wheel-speed sensor terminal B)
D	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
E	RR wheel-speed (signal)	RR ABS wheel-speed sensor	Continuity	E—RR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (E—RR ABS wheel-speed sensor terminal A)
F	—	—	—	—	—	—
G	—	—	—	—	—	—
H	CAN_H	Data link connector-2 (CAN_H)	Continuity	H—DLC-2 terminal CAN_H	Continuity detected	• Wiring harness (H—DLC-2 terminal CAN_H)
I	LF wheel-speed (signal)	LF ABS wheel-speed sensor	Continuity	I—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (I—LF ABS wheel-speed sensor terminal A)
J	—	—	—	—	—	—
K	LF wheel-speed (ground)	LF ABS wheel-speed sensor	Continuity	K—LF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (K—LF ABS wheel-speed sensor terminal B)
L	CAN_L	Data link connector-2 (CAN_L)	Continuity	L—DLC-2 terminal CAN_L	Continuity detected	• Wiring harness (L—DLC-2 terminal CAN_L)
M	—	—	—	—	—	—
N	Power supply (system)	Ignition switch	Voltage	The ignition switch is at the ON position.	B+	• Wiring harness (N—ignition switch)
				The ignition switch is off.	1 V or less	—
O	RF wheel-speed (ground)	RF ABS wheel-speed sensor	Continuity	O—RF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (O—RF ABS wheel-speed sensor terminal B)
P	—	—	—	—	—	—
Q	RF wheel-speed (signal)	RF ABS wheel-speed sensor	Continuity	Q—RF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (Q—RF ABS wheel-speed sensor terminal A)
R	—	—	—	—	—	—
S	—	—	—	—	—	—
T	—	—	—	—	—	—
U	LR wheel-speed (signal)	LR ABS wheel-speed sensor	Continuity	U—LR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (U—LR ABS wheel-speed sensor terminal A)
V	—	—	—	—	—	—
W	LR wheel-speed (ground)	LR ABS wheel-speed sensor	Continuity	W—LR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (W—LR ABS wheel-speed sensor terminal B)
X	—	—	—	—	—	—
Y	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (Y—battery)
Z	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (Z—battery)

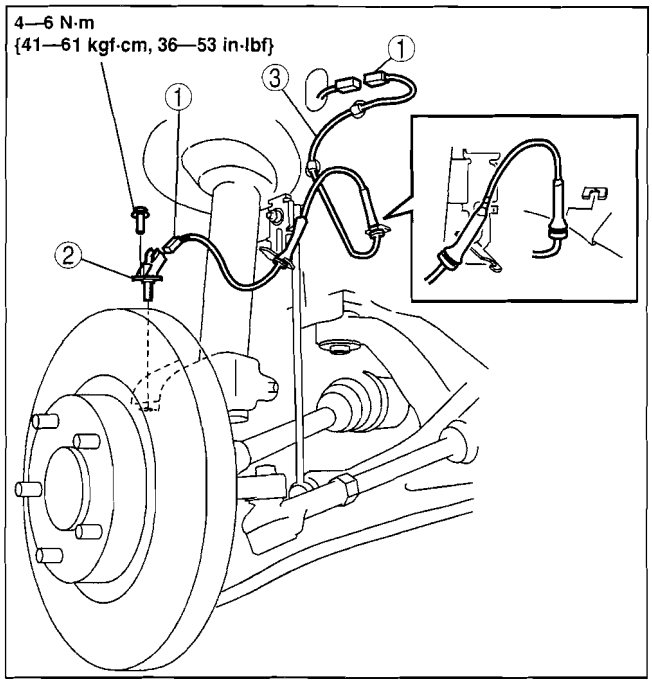
FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041300800700

1. Remove the mudguard.
2. Remove in the order indicated in the table.

1	Connector
2	Front ABS wheel-speed sensor
3	Front ABS wheel-speed sensor wiring harness

3. Install in the reverse order of removal.



c3u0413w001

FRONT ABS WHEEL-SPEED SENSOR INSPECTION

id041300801300

Installation Visual Inspection

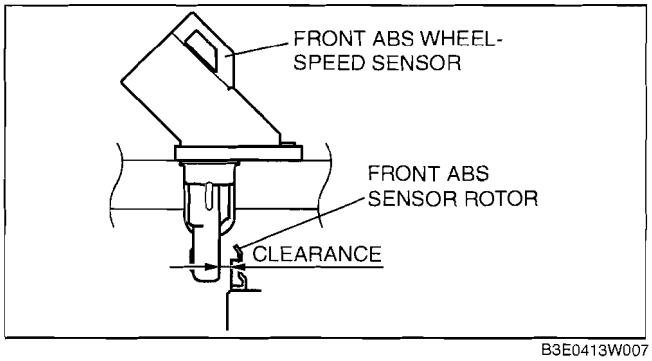
1. Inspect for the following:
   - If there is any malfunction, replace the part.

   (1) Excessive play of the ABS wheel-speed sensor
   (2) Deformation of the ABS wheel-speed sensor
   (3) Deformation or damage of the ABS sensor rotor

Clearance Inspection

1. Inspect the clearance between the front ABS wheel-speed sensor and the ABS sensor rotor.
   - If there is any malfunction, verify improper installation and replace if necessary.

Clearance
2.1 mm {0.082 in} or less



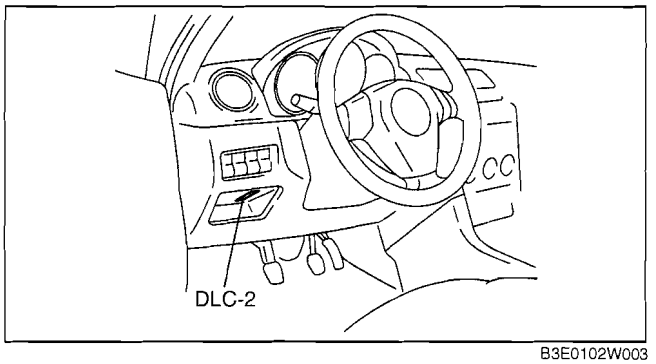
B3E0413W007

Sensor Output Value Inspection

Caution

- **Resistance inspection using other testers may cause damage to the ABS wheel-speed sensor internal circuit. Be sure to use the M-MDS to inspect the ABS wheel-speed sensor.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs using the M-MDS:
   - LF_WSPD
     (LF wheel-speed sensor)
   - RF_WSPD
     (RF wheel-speed sensor)
4. Start the engine and drive the vehicle.
5. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the front ABS wheel-speed sensor.

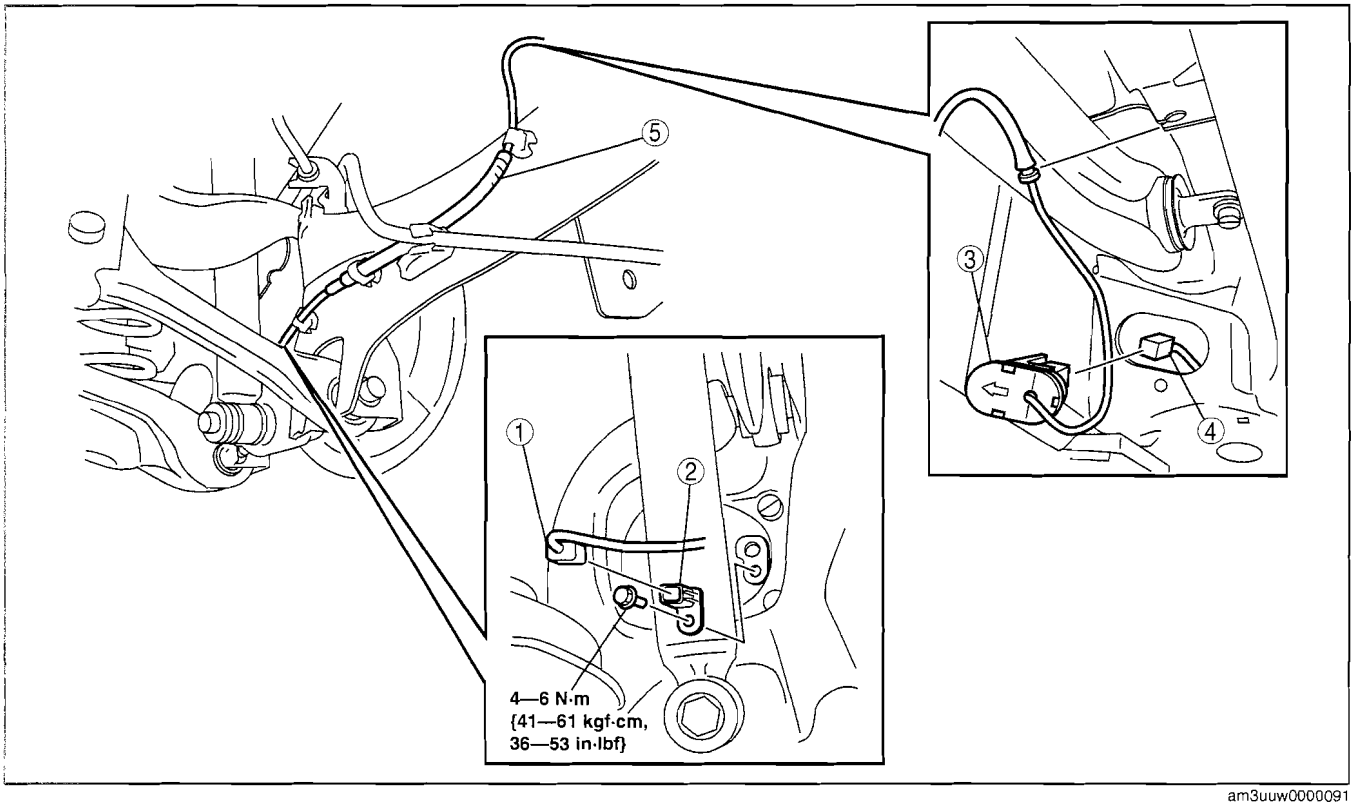


B3E0102W003

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041300800500

1. Remove the under cover (rear).
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



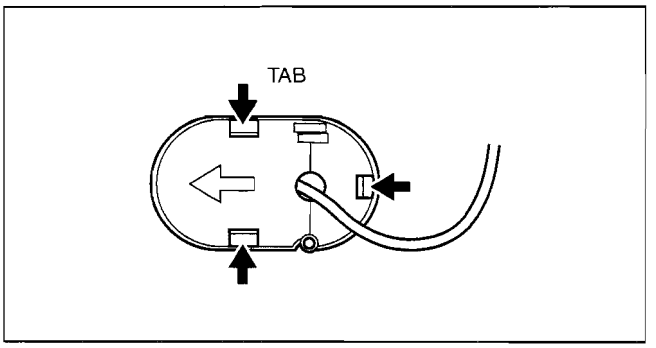
am3uuw0000091

1	Connector
2	Rear ABS wheel-speed sensor
3	ABS hole cover (See 04-13-10 ABS Hole Cover Removal Note.) (See 04-13-10 ABS Hole Cover Installation Note.)

4	Connector
5	Rear ABS wheel-speed sensor wiring harness (See 04-13-10 Rear ABS Wheel-speed Sensor Wiring Harness Installation Note.)

ABS Hole Cover Removal Note

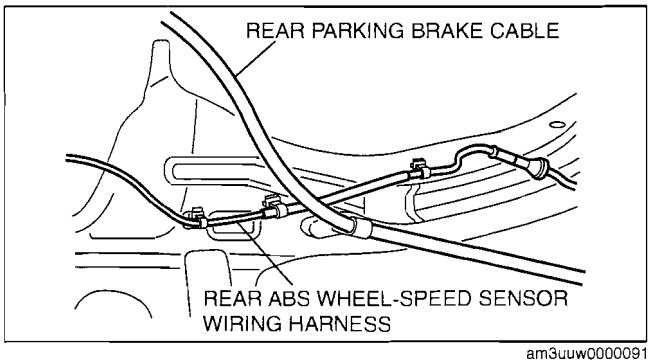
1. Press the tab of the ABS hole cover to separate the ABS hole cover from the body.
2. Remove the ABS hole cover from the body.



am3uuw0000091

Rear ABS Wheel-speed Sensor Wiring Harness Installation Note

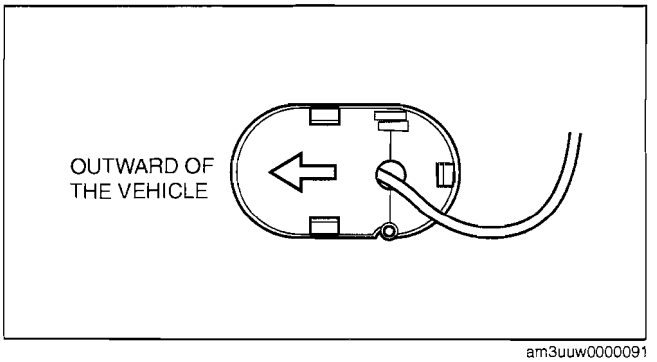
1. Pass the rear ABS wheel-speed sensor wiring harness outside the rear parking brake cable as shown in the figure.
2. Install the rear ABS wheel-speed sensor wiring harness.



am3uuw0000091

ABS Hole Cover Installation Note

1. Install the ABS hole cover into the body so that the arrow on it is facing toward the outer side of the vehicle.



am3uuw0000091

REAR ABS WHEEL-SPEED SENSOR INSPECTION

id041300801200

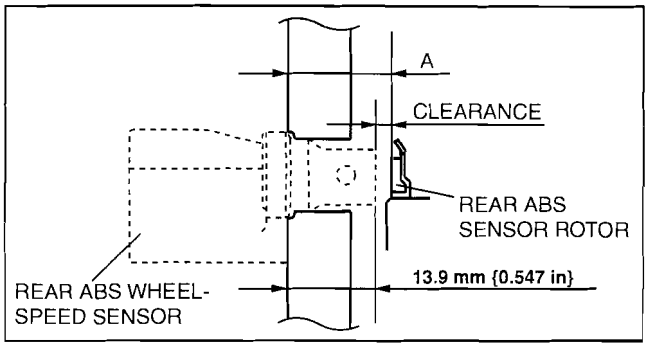
Installation Visual Inspection

1. Inspect for the following:
   - If there is any malfunction, replace the part.

   (1) Excessive looseness or play of the ABS wheel-speed sensor
   (2) Deformation of the ABS wheel-speed sensor
   (3) Deformation or damage of the ABS sensor rotor

Clearance Inspection

1. Remove the rear ABS wheel-speed sensor.
2. Measure the distance between the rear ABS wheel-speed sensor installation surface and the ABS sensor rotor. This is dimension A.
3. Calculate the clearance between the rear ABS wheel-speed sensor and the ABS sensor rotor using the following formula:
   Clearance (mm {in}) = A –13.9 {0.547}
4. Verify that the clearance between the ABS sensor rotor and the rear ABS wheel-speed sensor is as indicated below.
   - If there is any malfunction, replace it.



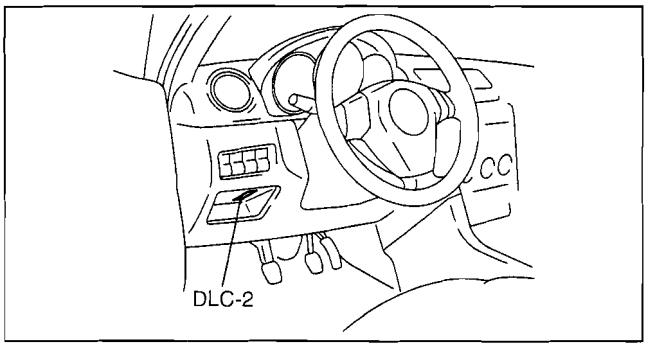
B3E0413W008

Clearance
1.46 mm {0.057 in} or less

Sensor Output Value Inspection

Caution
- **Resistance inspection using other testers may cause damage to the ABS wheel-speed sensor internal circuit. Be sure to use the M-MDS to inspect the ABS wheel-speed sensor.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs using the M-MDS:
   - LR_WSPD
     (LR wheel-speed sensor)
   - RR_WSPD
     (RR wheel-speed sensor)
4. Start the engine and drive the vehicle.
5. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the ABS wheel-speed sensor.

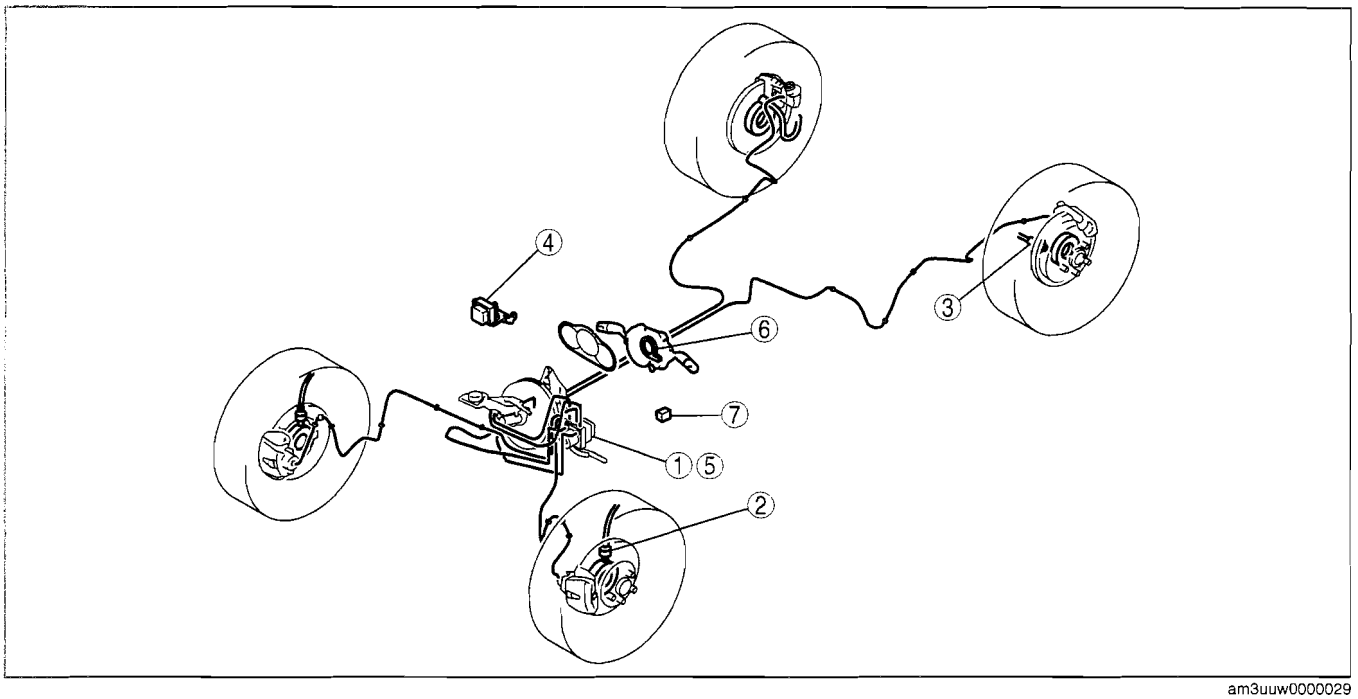


B3E0102W003

04-15 DYNAMIC STABILITY CONTROL

DSC LOCATION INDEX

id041500802100

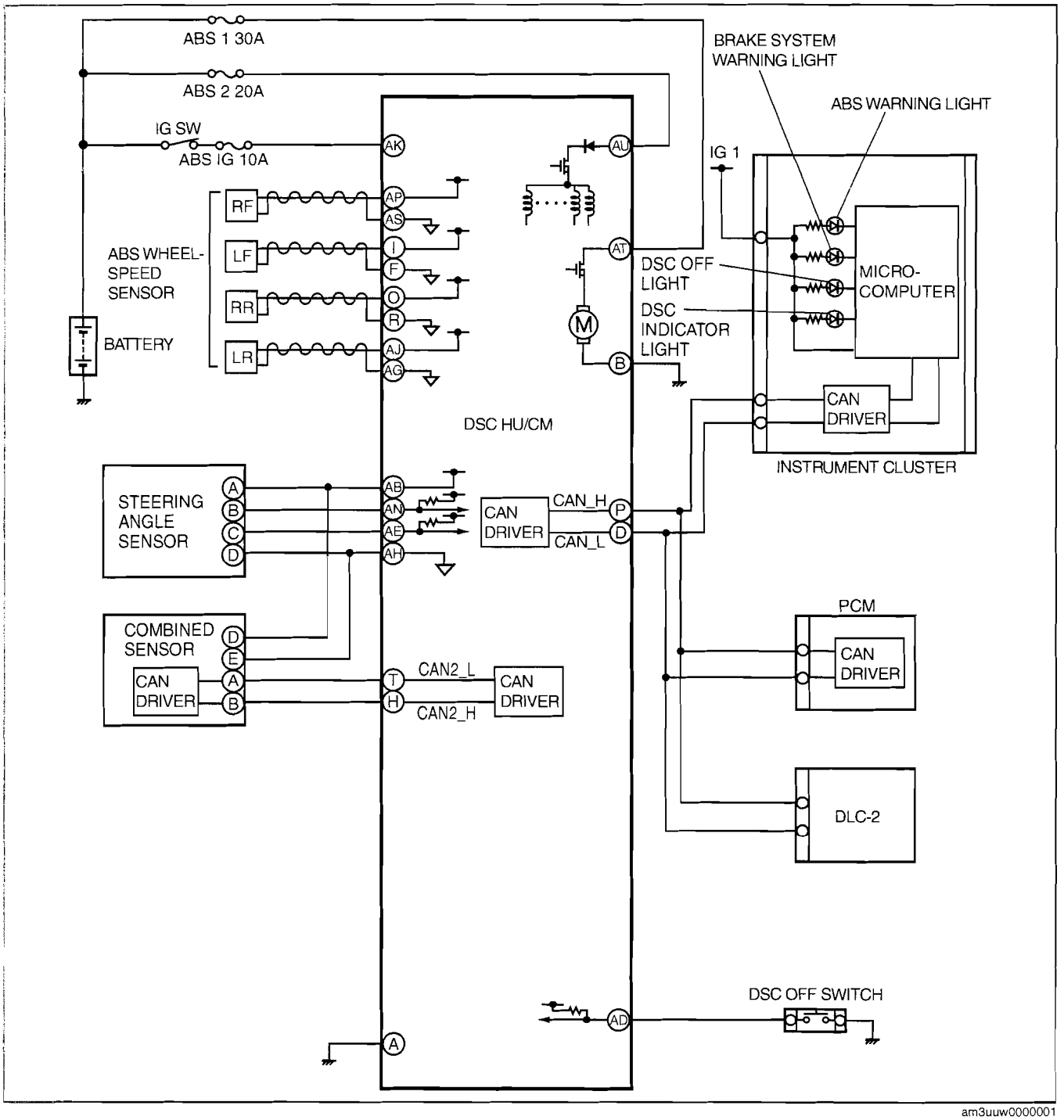


am3uuw0000029

1	DSC HU/CM (See 04-15-3 DSC SYSTEM INSPECTION.) (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.) (See 04-15-8 DSC CONFIGURATION.) (See 04-15-8 DSC HU/CM INSPECTION.)
2	Front ABS wheel-speed sensor (See 04-15-10 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-15-10 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)
3	Rear ABS wheel-speed sensor (See 04-15-10 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-15-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)
4	Combined sensor (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.) (See 04-15-11 COMBINED SENSOR INSPECTION.) (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.)
5	Brake fluid pressure sensor (Built into DSC HU/CM) (See 04-15-12 BRAKE FLUID PRESSURE SENSOR INSPECTION.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
6	Steering angle sensor (See 04-15-13 STEERING ANGLE SENSOR REMOVAL/INSTALLATION.) (See 04-15-13 STEERING ANGLE SENSOR INSPECTION.)
7	DSC OFF switch (See 04-15-14 DSC OFF SWITCH REMOVAL/ INSTALLATION.) (See 04-15-14 DSC OFF SWITCH INSPECTION.)

DSC SYSTEM WIRING DIAGRAM

id041500800600



am3uuw0000001

DSC SYSTEM INSPECTION

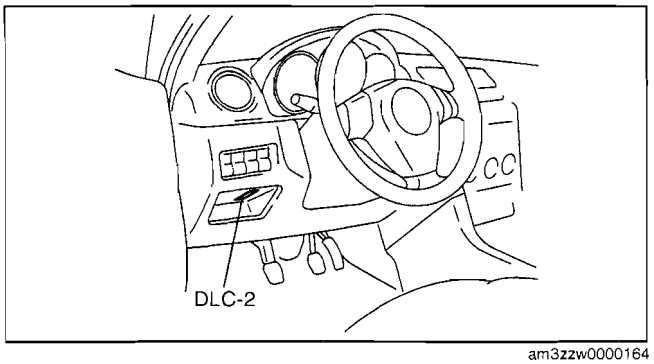
id041500800700

Preparation

1. Verify that the battery is fully charged.
2. Turn the ignition switch to the ON position and verify that the ABS warning light goes out after **approx. 3.0 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to the N position.
6. Verify that all four wheels rotate.
7. Rotate the inspected wheels by hand and verify there is no brake drag.
   - If there is any brake drag, perform regular brake inspection.
   - If there is no brake drag, perform DSC HU/CM operation inspection.

ABS Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)



am3zzw0000164

Brake pressure retention

Command name	Inspected wheels			
	LF	RF	LR	RR
LF_TC_PRV	OFF			
RF_TC_PRV				
LF_TC_SWV				
RF_TC_SWV				
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET	OFF			
LR_INLET			ON	
LR_OUTLET			OFF	
RF_INLET		ON		
RF_OUTLET		OFF		
RR_INLET				ON
RR_OUTLET				OFF
PMP_MOTOR				

Brake pressure reduction

Command name	Inspected wheels			
	LF	RF	LR	RR
LF_TC_PRV	OFF			
RF_TC_PRV				
LF_TC_SWV				
RF_TC_SWV				
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET				
LR_INLET	OFF		ON	
LR_OUTLET				
RF_INLET		ON	OFF	
RF_OUTLET				
RR_INLET		OFF		ON
RR_OUTLET				
PMP_MOTOR	ON			

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the DSC HU/CM.**

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

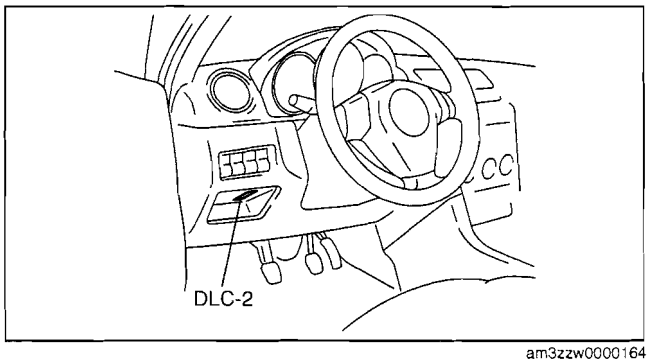
4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.
5. When brake pressure is maintained and a DSC HU/CM operation click sound is heard, confirm that the wheel does not rotate. When brake pressure is being reduced and a DSC HU/CM operation click sound is heard, confirm that the wheel rotates.
   - Performing the inspection above determines the following:
     — The DSC HU/CM brake lines are normal.
     — The DSC HU/CM hydraulic system has no significant malfunction (including DSC HU/CM).
     — The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
     — The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
   - However, the following items cannot be verified.
     — Intermittent malfunction of the above items
     — Malfunction of DSC HU/CM input system wiring harnesses and parts
     — Extremely small leakage in the DSC HU/CM internal hydraulic system

DSC Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the DSC HU/CM.**



am3zzw0000164

Command name	Inspected wheels			
	Understeer control disabled		Oversteer control disabled	
	LF	RF	LR	RR
LF_TC_PRV	ON	OFF		ON
RF_TC_PRV	OFF	ON		OFF
LF_TC_SWV	OFF			
RF_TC_SWV				
LF_INLET	OFF	OFF	OFF	ON
LF_OUTLET				OFF
LR_INLET		ON		
LR_OUTLET		OFF		
RF_INLET			ON	
RF_OUTLET			OFF	
RR_INLET	ON			
RR_OUTLET	OFF			
PMP_MOTOR	ON			

4. Send the command while rotating the wheel being inspected by hand in a forward direction.
5. Confirm that the wheel does not rotate easily while a DSC HU/CM operation click sound is heard.
   - Performing the inspection above determines the following:
     — The DSC HU/CM brake lines are normal.
     — The DSC HU/CM hydraulic system has no significant malfunction (including DSC HU/CM).
     — The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
     — The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
   - However, the following items cannot be verified.
     — Intermittent malfunction of the above items
     — Malfunction of DSC HU/CM input system wiring harnesses and parts
     — Extremely small leakage in the DSC HU/CM internal hydraulic system

DSC HU/CM REMOVAL/INSTALLATION

id041500801000

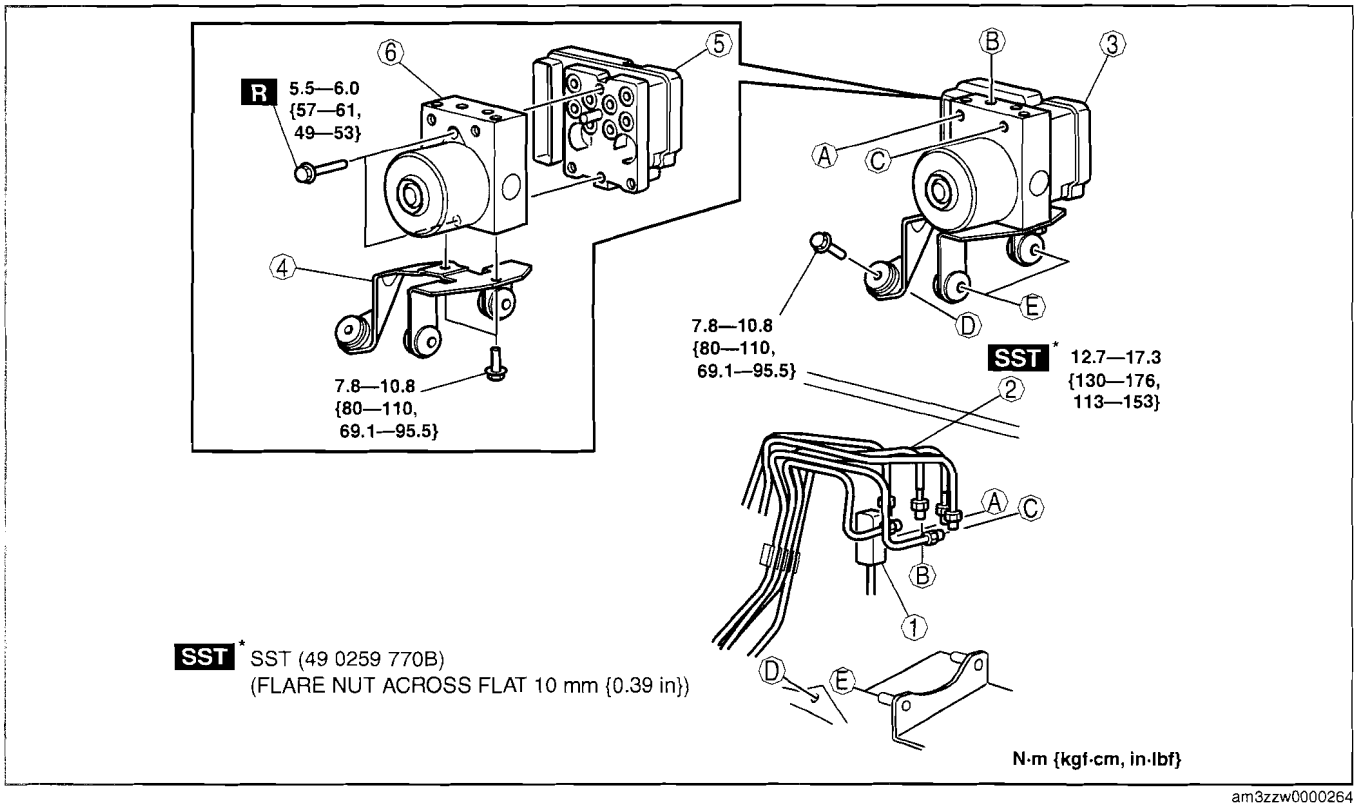
Caution

- **When replacing the DSC HU/CM, the configuration procedure must be done before removing the DSC HU/CM. If the configuration is not completed before removing the DSC HU/CM, DSC will not work properly after installation of the DSC HU/CM.**
- **The DSC may not function normally immediately after the DSC HU/CM is replaced. After installation, always perform the initialization procedures for the combined sensor, brake fluid pressure sensor.**
- **Always use the adapter that comes with a new DSC HU or DSC CM when separating the DSC HU or DSC CM. Otherwise, the pump motor may come off the DSC HU and be damaged. Therefore, do not separate the DSC HU and DSC CM unless replacing them. When replacing them with new ones, always perform procedures according to the instructions included with the new parts.**
- **The internal parts of the DSC HU/CM could be damaged if dropped. Be careful not to drop the DSC HU/CM. Replace the DSC HU/CM if it is subjected to an impact.**

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the reserve hose (MTX vehicles). (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].) (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Configurate the DSC HU/CM (only when replacing it). (See 04-15-8 DSC CONFIGURATION.)
6. Perform the initialization procedures for the combined sensor, brake fluid pressure sensor. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
7. Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

Note

- Even if the initialization procedure is performed after replacing the DSC HU/CM, DTCs B2141 and C2785 are stored in the memory as past malfunctions.

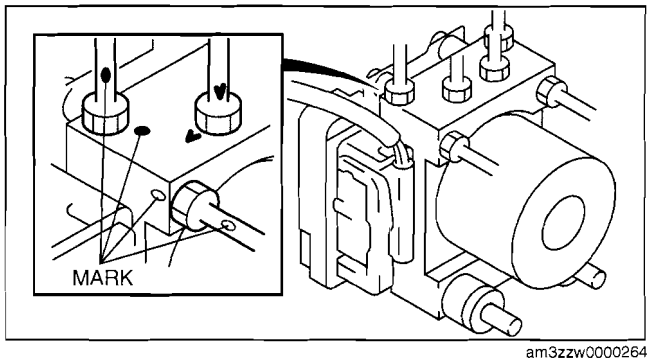


am3zzw0000264

1	Connector (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
2	Brake pipe (See 04-15-7 Brake Pipe Removal Note.) (See 04-15-7 Brake Pipe Installation Note.)
3	DSC HU/CM, bracket (See 04-15-7 DSC HU/CM, Bracket Removal Note.)
4	Bracket
5	DSC CM
6	DSC HU

Brake Pipe Removal Note

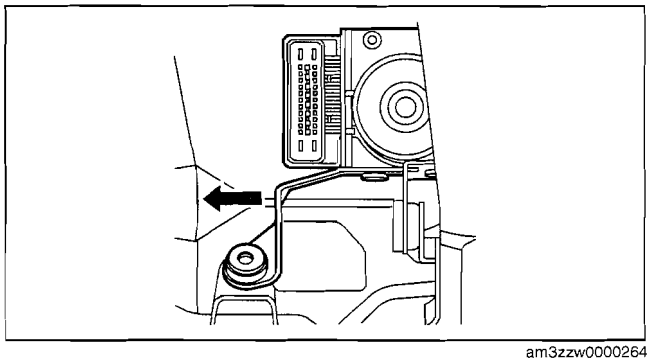
1. Place an alignment mark on the brake pipe and DSC HU/CM.
2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.



am3zzw0000264

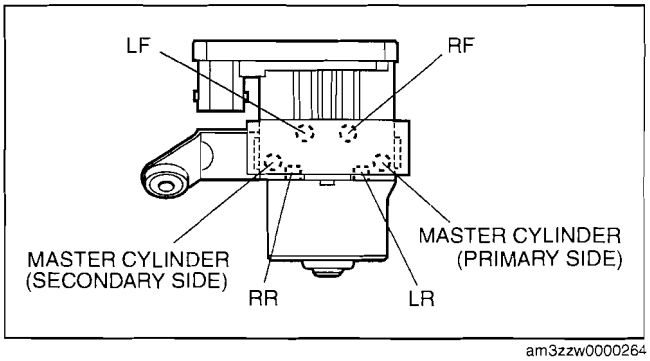
DSC HU/CM, Bracket Removal Note

1. As shown in the figure, move the bracket in the direction of the arrow and remove the DSC HU/CM and bracket from the body.


am3zzw0000264

Brake Pipe Installation Note

1. Align the marks made before removal and install the brake pipe into the DSC HU/CM referring to the figure.

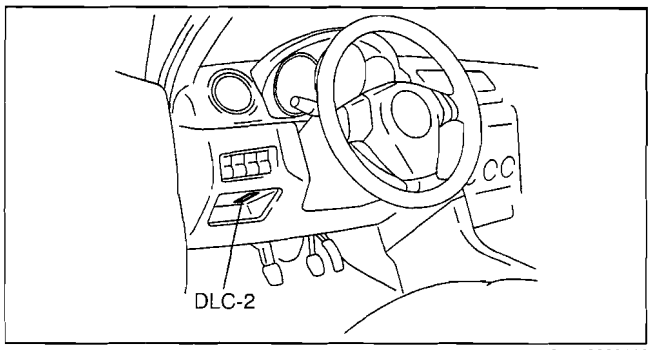


am3zzw0000264

DSC CONFIGURATION

id041500800800

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module programming".
3. Then, select the "Programmable Module Installation" and "ABS" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)



am3zzw0000162

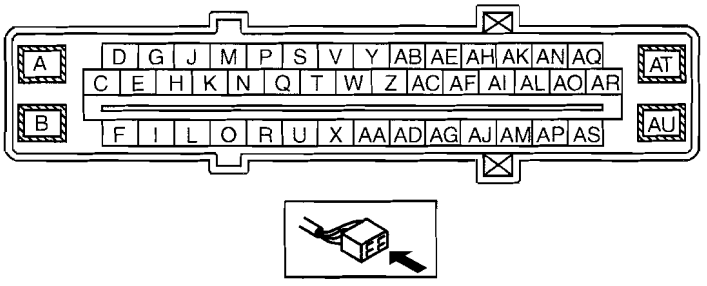
DSC HU/CM INSPECTION

id041500801100

1. Disconnect the DSC HU/CM connector.
2. Connect the negative battery cable.
3. Attach the tester lead to the DSC HU/CM wiring harness-side connector and inspect voltage, continuity, or resistance according to the standard (reference) on the table.

Standard (Reference)

DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



am3zzw0000264

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
A	Ground (system)	Ground point	Continuity	A—ground point	Continuity detected	• Wiring harness (A—ground point)
B	Ground (ABS motor)	Ground point	Continuity	B—ground point	Continuity detected	• Wiring harness (B—ground point)
C	—	—	—	—	—	—
D	CAN_L	DLC-2 (CAN_L)	Continuity	D—DLC-2 terminal CAN_L	Continuity detected	• D—DLC-2 terminal CAN_L
E	—	—	—	—	—	—
F	LF wheel-speed sensor (ground)	LF wheel-speed sensor	Continuity	F—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (F—LF ABS wheel-speed sensor terminal A)
G	—	—	—	—	—	—
H	CAN2_H	Combined sensor	Continuity	H—combined sensor terminal B	Continuity detected	• Wiring harness (H—combined sensor terminal B)
I	LF wheel-speed sensor (single)	LF ABS wheel-speed sensor	Continuity	I—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (I—LF ABS wheel-speed sensor terminal A)
J	—	—	—	—	—	—
K	—	—	—	—	—	—
L	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
M	—	—	—	—	—	—
N	—	—	—	—	—	—
O	RR wheel-speed (signal)	RR ABS wheel-speed sensor	Continuity	O—RR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (O—RR ABS wheel-speed sensor terminal A)
P	CAN_H	DLC-2 (CAN_H)	Continuity	P—DLC-2 terminal CAN_H	Continuity detected	• Wiring harness (P—DLC-2 terminal CAN_H)
Q	—	—	—	—	—	—
R	RR wheel-speed (ground)	RR ABS wheel-speed sensor	Continuity	R—RR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (R—RR ABS wheel-speed sensor terminal B)
S	—	—	—	—	—	—
T	CAN2_L	Combined sensor	Continuity	T—combined sensor terminal A	Continuity detected	• Wiring harness (T—combined sensor terminal A)
U	—	—	—	—	—	—
V	—	—	—	—	—	—
W	—	—	—	—	—	—
X	—	—	—	—	—	—
Y	—	—	—	—	—	—
Z	—	—	—	—	—	—
AA	—	—	—	—	—	—
AB	Sensor power supply	Combined sensor, steering angle sensor	Continuity	AB—combined sensor terminal D AB—steering angle sensor terminal A	Continuity detected	• Wiring harness (AB—combined sensor terminal D) • Wiring harness (AB—steering angle sensor terminal A)
AC	—	—	—	—	—	—
AD	DSC OFF switch	DSC OFF switch	Continuity	AD—DSC OFF switch	Continuity detected	• Wiring harness (AD—DSC OFF switch)
AE	Steering angle sensor (signal B)	Steering angle sensor	Continuity	AE—steering angle sensor terminal C	Continuity detected	• Wiring harness (AE—steering angle sensor terminal C)
AF	—	—	—	—	—	—
AG	LR wheel-speed (ground)	LR wheel-speed sensor	Continuity	AG—LR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (AG—LR ABS wheel-speed sensor terminal B)
AH	Sensor ground	Combined sensor, steering angle sensor	Continuity	AH—combined sensor terminal E AH—steering angle sensor terminal D	Continuity detected	• Wiring harness (AH—combined sensor terminal E) • Wiring harness (AH—steering angle sensor terminal D)
AI	—	—	—	—	—	—
AJ	LR wheel-speed (signal)	LR ABS wheel-speed sensor	Continuity	AJ—LR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (AJ—LR ABS wheel-speed sensor terminal A)
AK	Power supply (system)	Ignition switch	Voltage	The ignition switch is at the ON position.	B+	• Wiring harness (AK—ignition switch)
				The ignition switch is off.	1 V or less	—
AL	—	—	—	—	—	—
AM	—	—	—	—	—	—
AN	Steering angle sensor (signal A)	Steering angle sensor	Continuity	AN—steering angle sensor terminal B	Continuity detected	• Wiring harness (AN—steering angle sensor terminal B)
AO	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
AP	RF wheel-speed (signal)	RF ABS wheel-speed sensor	Continuity	AP—RF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (AP—RF ABS wheel-speed sensor terminal A)
AQ	—	—	—	—	—	—
AR	—	—	—	—	—	—
AS	RF wheel-speed (ground)	RF ABS wheel-speed sensor	Continuity	AS—RF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (AS—RF ABS wheel-speed sensor terminal B)
AT	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AT—battery)
AU	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AU—battery)

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041500800300

1. Remove or install the front ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)

FRONT ABS WHEEL-SPEED SENSOR INSPECTION

id041500800400

1. Inspect the front ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041500800100

1. Remove or install the rear ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)

REAR ABS WHEEL-SPEED SENSOR INSPECTION

id041500800200

1. Inspect the rear ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)

COMBINED SENSOR REMOVAL/INSTALLATION

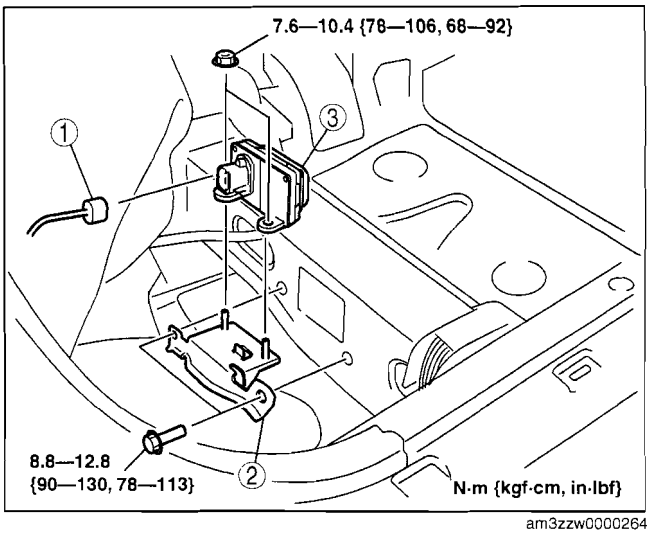
id041500801200

Caution
- **The DSC may not function normally immediately after the combined sensor/ is replaced. After installation, always perform the initialization procedures for the combined sensor.**
- **The internal parts of the combined sensor could be damaged if dropped. Be careful not to drop the combined sensor. Replace the combined sensor if it is subjected to an impact. Also, do not use an impact wrench or other similar air tools when removing/installing the sensor.**

1. Perform the following and partially peel back the floor covering.
   (1) Remove the front seat (RH). (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
   (2) Remove the woofer. (See 09-20-10 WOOFER REMOVAL/INSTALLATION.)
   (3) Remove the front scuff plate (RH). (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Remove the front side trim (RH). (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)

2. Remove in the order indicated in the table.

1	Combined sensor connector
2	Bracket
3	Combined sensor



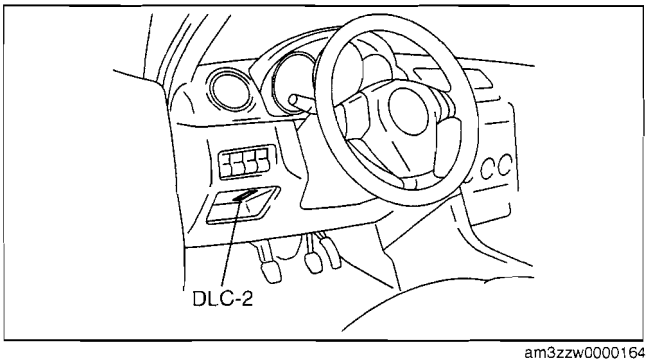
am3zzw0000264

3. Install in the reverse order of removal.
4. After installation, perform the combined sensor initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.)

COMBINED SENSOR INSPECTION

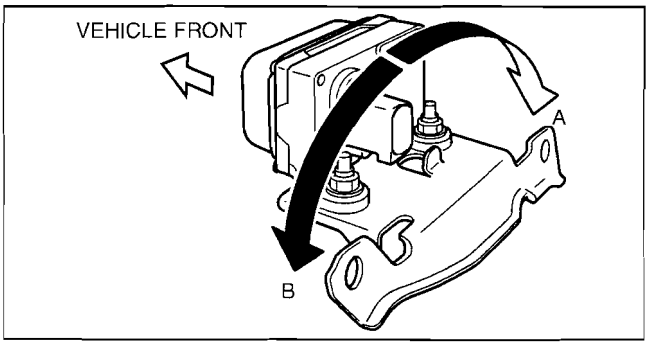
id041500801300

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs and inspect the lateral acceleration and yaw rate. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
   — LAT_ACCL (lateral acceleration)
   — YAW_RATE (yaw rate)
   (1) Lateral acceleration inspection



am3zzw0000164

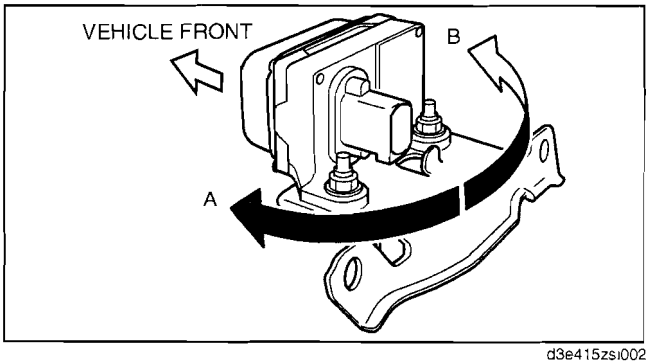
1) Verify the LAT_ACCL change when the combined sensor is tilted to the left and right.
- If there is any malfunction, replace the combined sensor.(See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)



am3zzw0000164

Standard
When the sensor is tilted to the right (A):
LAT_ACCL changes positively.
When the sensor is tilted to the left (B):
LAT_ACCL changes negatively.

(2) Yaw rate inspection
1) Verify the YAW_RATE change when the combined sensor is rotated to the left and right.
- If there is any malfunction, replace the combined sensor. (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)



d3e415zsi002

Standard
When the sensor is rotated to the right (A):
YAW_RATE changes negatively.
When the sensor is rotated to the left (B):
YAW_RATE changes positively.

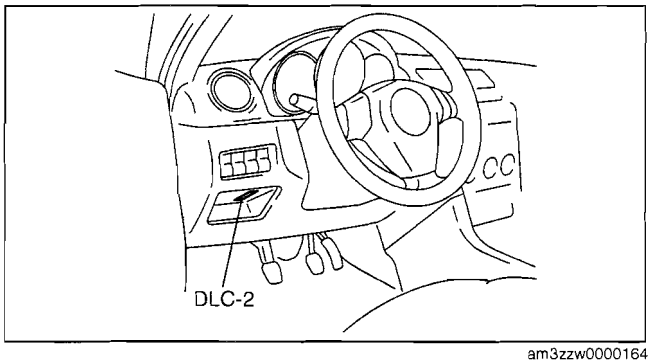
COMBINED SENSOR INITIALIZATION PROCEDURE

id041500801400

Warning

- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, after replacing or removing the combined sensor or DSC HU/CM, make sure to perform the initialization procedure to insure proper DSC operation.**

1. Inspect the wheel alignment and the tire pressure.
   - If there is any malfunction, adjust the applicable part.
2. Position the vehicle on level ground.
3. Turn the ignition switch off.
4. Connect the M-MDS to the DLC-2.
5. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Chassis".
     2. Select "ABS/DSC".
     3. Select "Sensor Initialization".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
     4. Select "LATACCEL".
6. Perform the initialization procedure according to the directions on the screen.
7. Drive the vehicle.
8. After **5 min or more** of driving, verify that the DSC system is normal.



am3zzw0000164

BRAKE FLUID PRESSURE SENSOR INSPECTION

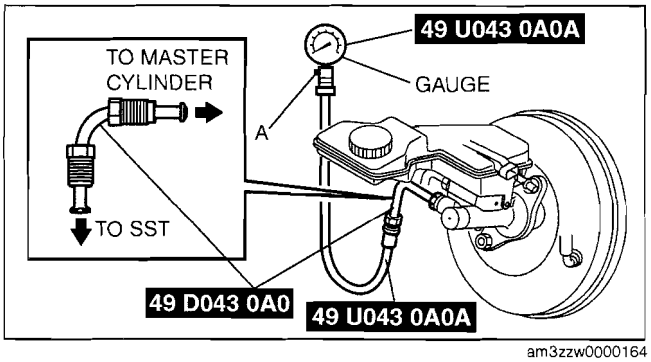
id041500801500

1. Turn the ignition switch off.
2. Install the **SSTs** to the master cylinder as shown in the figure.

Note

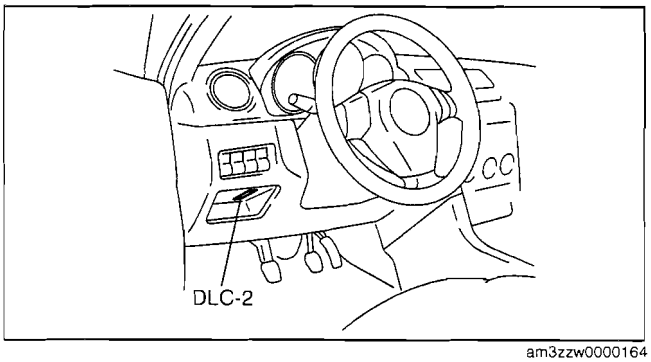
- When installing the **SST** (49 D043 0A0) to the master cylinder, use a commercially available flare nut wrench (flare nut across flat **12 mm {0.47 in}**).

3. Bleed the brake line and the **SSTs** of air. (Bleed the **SSTs** of air using air bleed valve A.)



am3zzw0000164

4. Connect the M-MDS to the DLC-2.
5. Select the "MPRETDR" PID. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
6. Start the engine.
7. Depress the brake pedal, and verify that the fluid pressure value of the **SST** (gauge) and the value shown on the M-MDS are equal.
   - If the fluid pressure values are different, replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)



am3zzw0000164

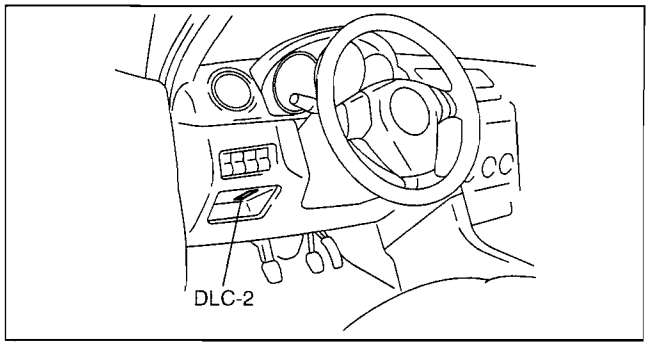
BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE

id041500802200

Warning

- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, after replacing or removing the DSC HU/CM, make sure to perform the initialization procedure to insure proper DSC operation.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Chassis".
     2. Select "ABS/DSC".
     3. Select "Sensor Initialization".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
     4. Select "MCYL_S_CAL".
4. Perform the initialization procedure according to the directions on the screen.
5. Drive the vehicle.
6. After **5 min or more** of driving, verify that the DSC system is normal.



am3zzw0000164

STEERING ANGLE SENSOR REMOVAL/INSTALLATION

id041500801600

1. When removing or installing the steering angle sensor, refer to the clock spring removal/installation procedure. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

STEERING ANGLE SENSOR INSPECTION

id041500801700

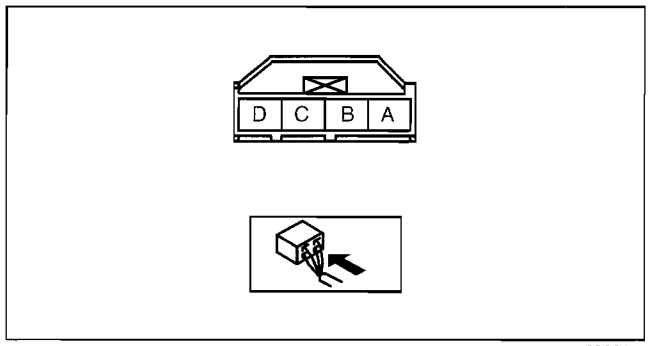
1. Remove the column cover.
2. Turn the ignition switch to the ON position and measure the voltage between steering angle sensor terminal A and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal A and DSC HU/CM terminal AB. Repair or replace if necessary.

   Standard voltage
   B+

3. Measure the voltage between steering angle sensor terminal D and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal D and DSC HU/CM terminal AH. Repair or replace if necessary.

   Standard voltage
   0 V

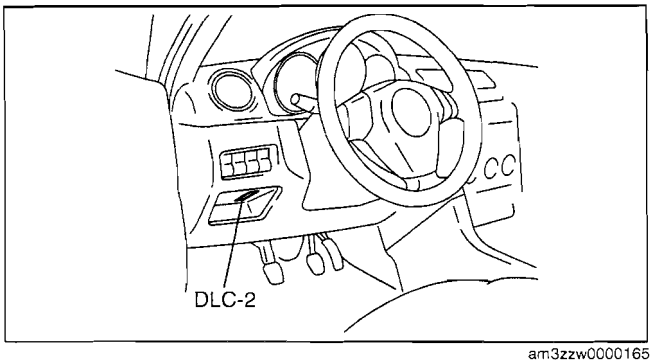
4. Turn the ignition switch off.



am3zzw0000165

5. Connect the M-MDS to the DLC-2.
6. Select the "SWA_POS" PID.
7. Verify the SWA_POS changes when the steering wheel is turned to the left and right.
   - If there is any malfunction, replace the steering angle sensor. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

Standard
When the steering wheel is turned to the left:
SWA_POS changes positively.
When the steering wheel is turned to the right:
SWA_POS changes negatively.

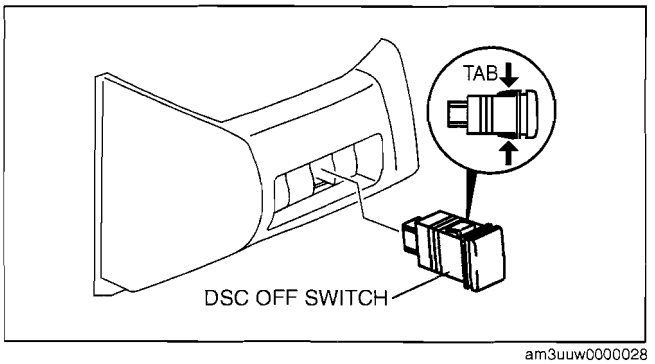


am3zzw0000165

DSC OFF SWITCH REMOVAL/INSTALLATION

id041500801900

1. Remove the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
2. While squeezing the tabs of the DSC OFF switch, pull the DSC OFF switch outward to remove it from the lower panel.
3. Install in the reverse order of removal.

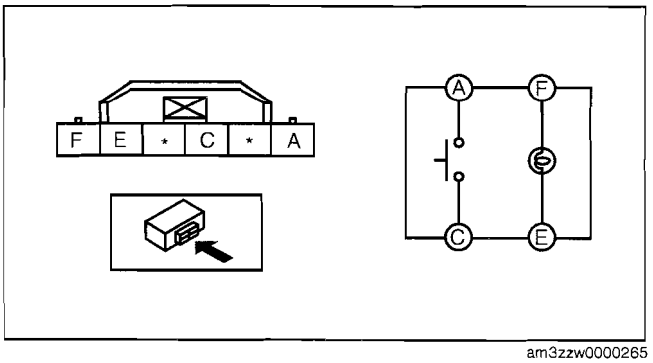


am3uuw0000028

DSC OFF SWITCH INSPECTION

id041500802000

1. Remove the DSC OFF switch. (See 04-15-14 DSC OFF SWITCH REMOVAL/INSTALLATION.)
2. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the DSC OFF switch.



am3zzw0000265

: Bulb : Continuity

Condition	Terminal			
	A	C	F	E
Switch pressed	○—○		○—⓪—○	
Switch released			○—⓪—○	

am3zzw0000265

04-50 TECHNICAL DATA

BRAKES TECHNICAL DATA

id045000800100

Item	Specification
Brake fluid type	SAE J1703, FMVSS 116 DOT3
Brake pedal height (reference value)	136.4 mm {5.37 in}
Brake pedal play	4.0—8.4 mm {0.16—0.33 in}
Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 kgf, 33.0 lbf})	89.8 mm {3.54 in} or more
Front disc plate runout limit	0.05 mm {0.002 in}
Minimum front disc plate thickness	23 mm {0.91 in}
Minimum front disc plate thickness after machining using a brake lathe on-vehicle	23.8 mm {0.94 in}
Minimum front disc pad thickness	2.0 mm {0.079 in} min.
Rear disc plate runout limit	0.05 mm {0.002 in}
Minimum read disc plate thickness	9 mm {0.35 in}
Minimum rear disc plate thickness after machining using a brake lathe on-vehicle	9.8 mm {0.39 in}
Minimum rear disc pat thickness	2.0 mm {0.079 in} min.
Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}	3—7 notches

Master cylinder fluid pressure

Vacuum amount at o kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	500 kPa {5.10 kgf/cm^2, 72.6 psi} or more

Master cylinder fluid pressure (except L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	6,500 kPa {66.29 kgf/cm^2, 942.8 psi} or more

Master cylinder fluid pressure (L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	7,000 kPa {71.39 kgf/cm^2, 1,016 psi} or more

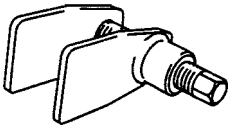
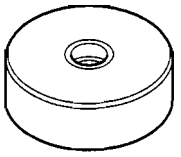
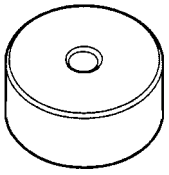
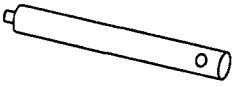
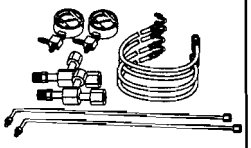
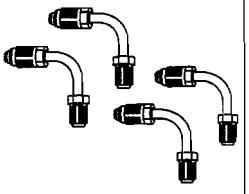
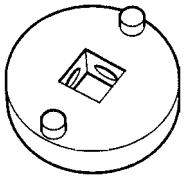
Proportioning valve fluid pressure

Front brake fluid pressure (kPa {kgf/cm^2, psi})	Rear brake fluid pressure (kPa {kgf/cm^2, psi})
5,000 {50.99, 725.2}	3,500—3,700 {35.70—37.72, 507.7—536.6}
10,000 {101.97, 1450.4}	4,950—5,250 {50.48—53.53, 718.0—761.4}

04-60 SERVICE TOOLS

BRAKES SST

id046000800100

49 0259 770B Flare nut wrench 	49 0221 600C Disc brake expand tool 	49 B033 001 Installer 
49 B026 301 Installer 	49 G033 102 Handle 	49 U043 0A0A Oil pressure gauge set 
49 D043 0A0 Adapter set 	49 F043 002 Wrench 	—

TRANSMISSION/TRANSAXLE

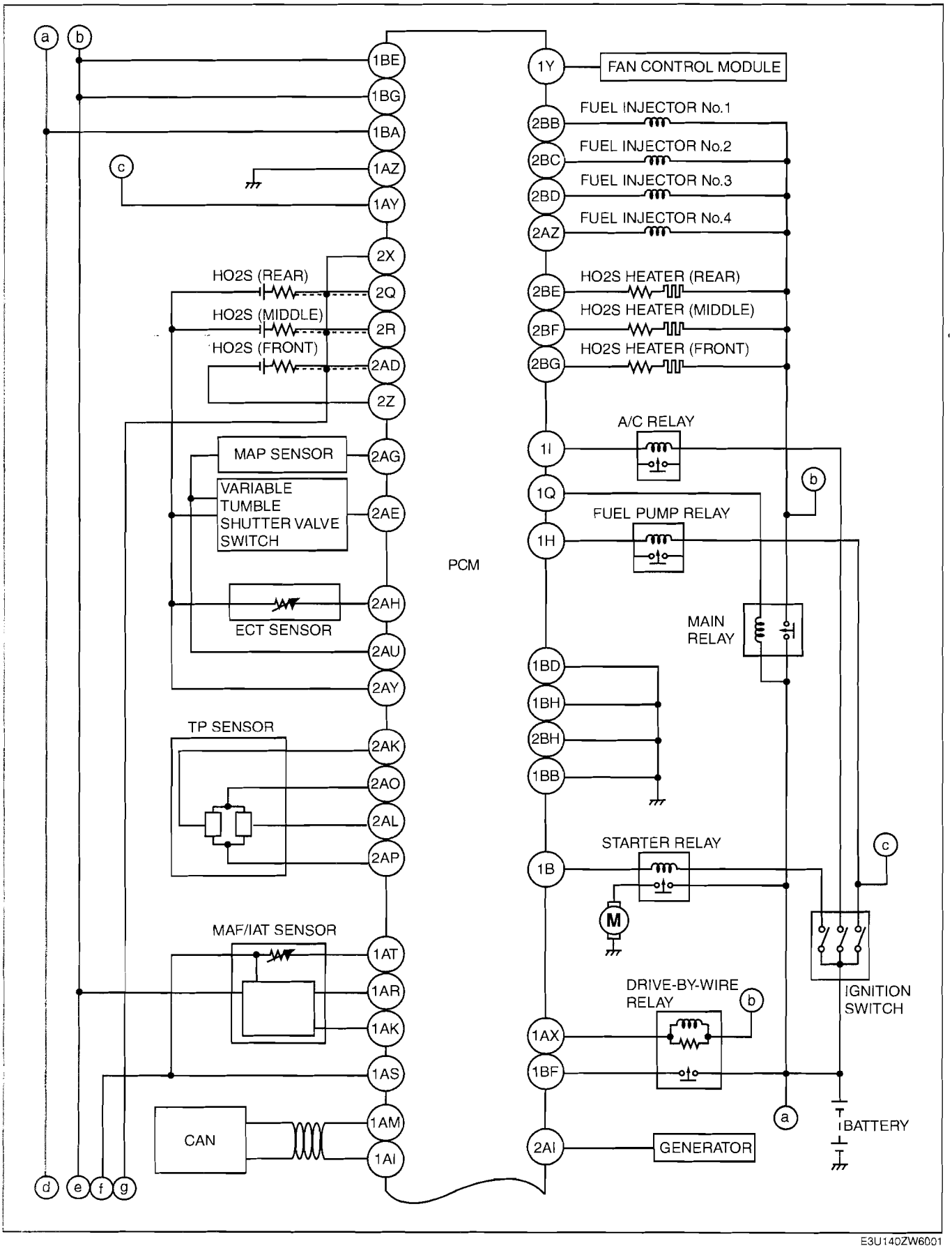
05 SECTION

05-02A ON-BOARD DIAGNOSTIC [FN4A-EL]

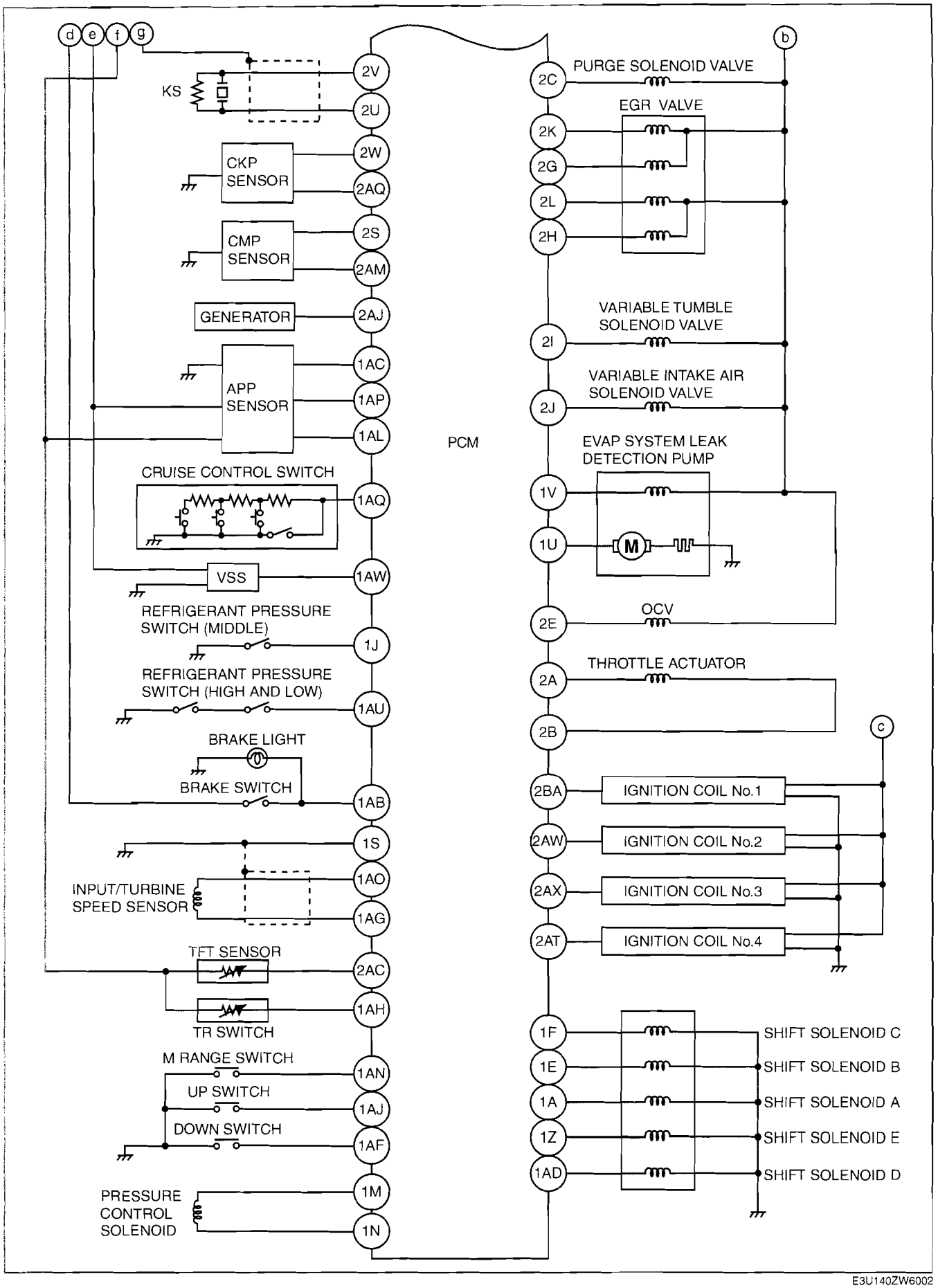
AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FN4A-EL]

id0502a1800100

California Emission Regulation Applicable Model

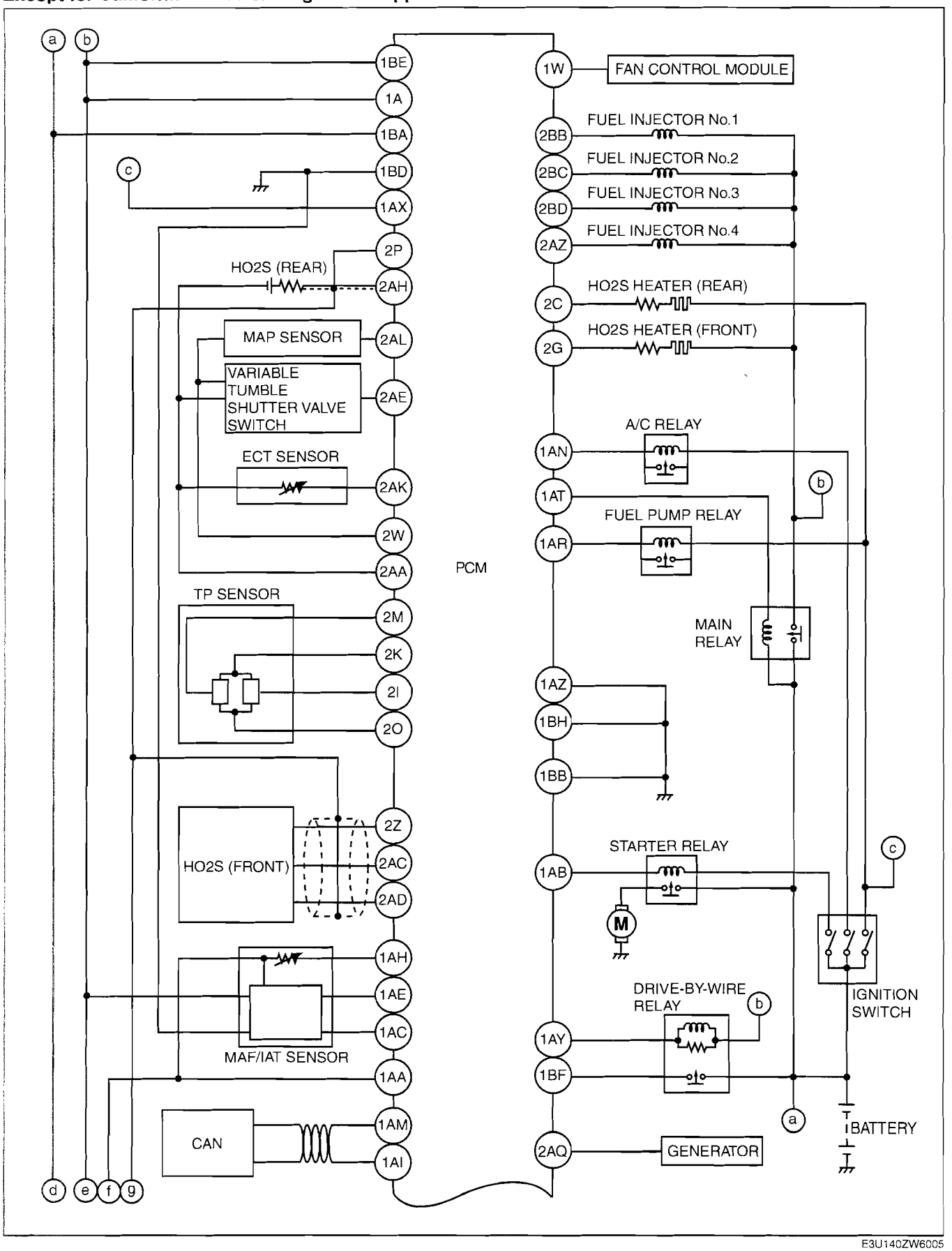


E3U140ZW6001

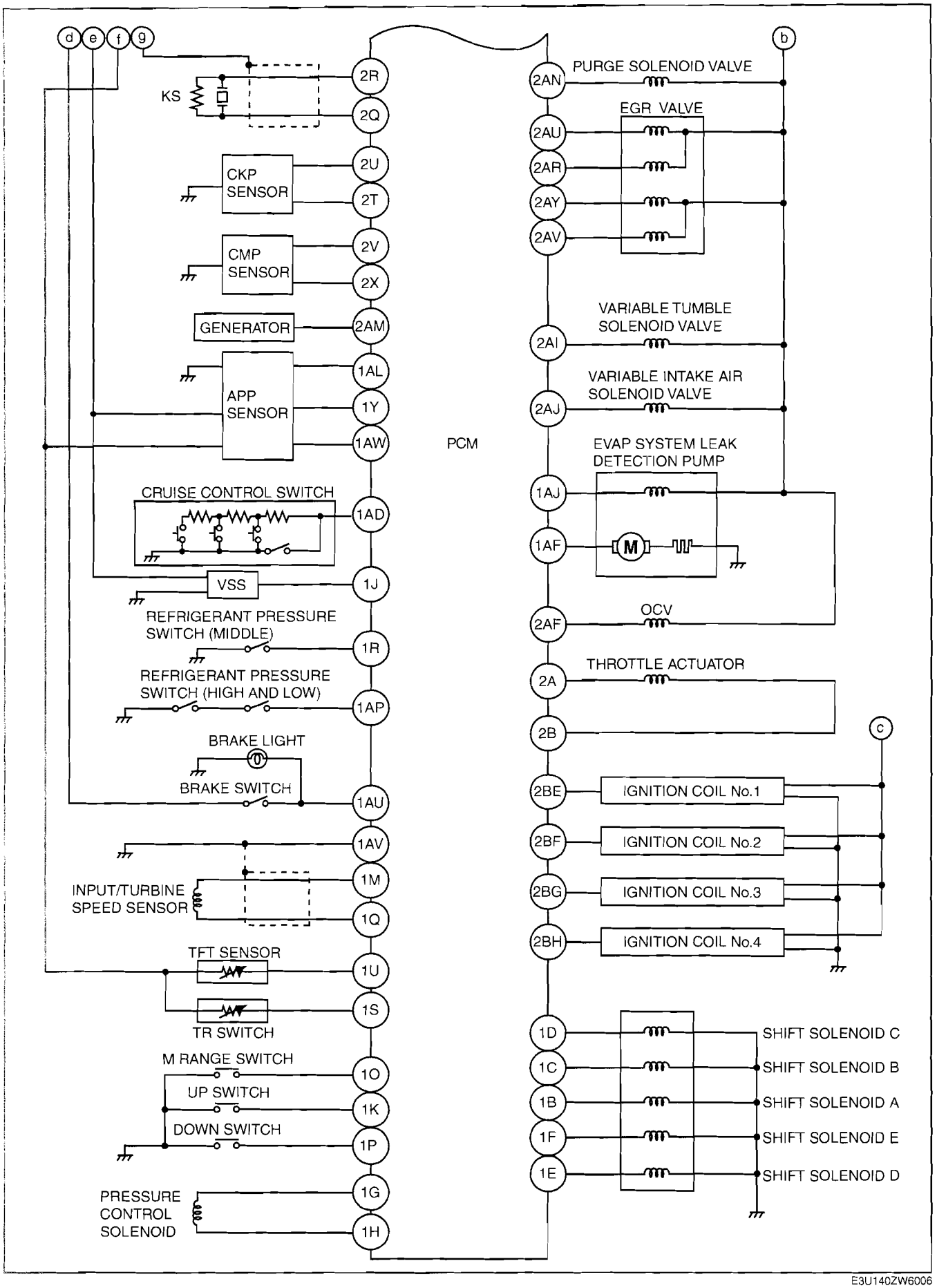


E3U140ZW6002

Except for California Emission Regulation Applicable Model



E3U140ZW6005

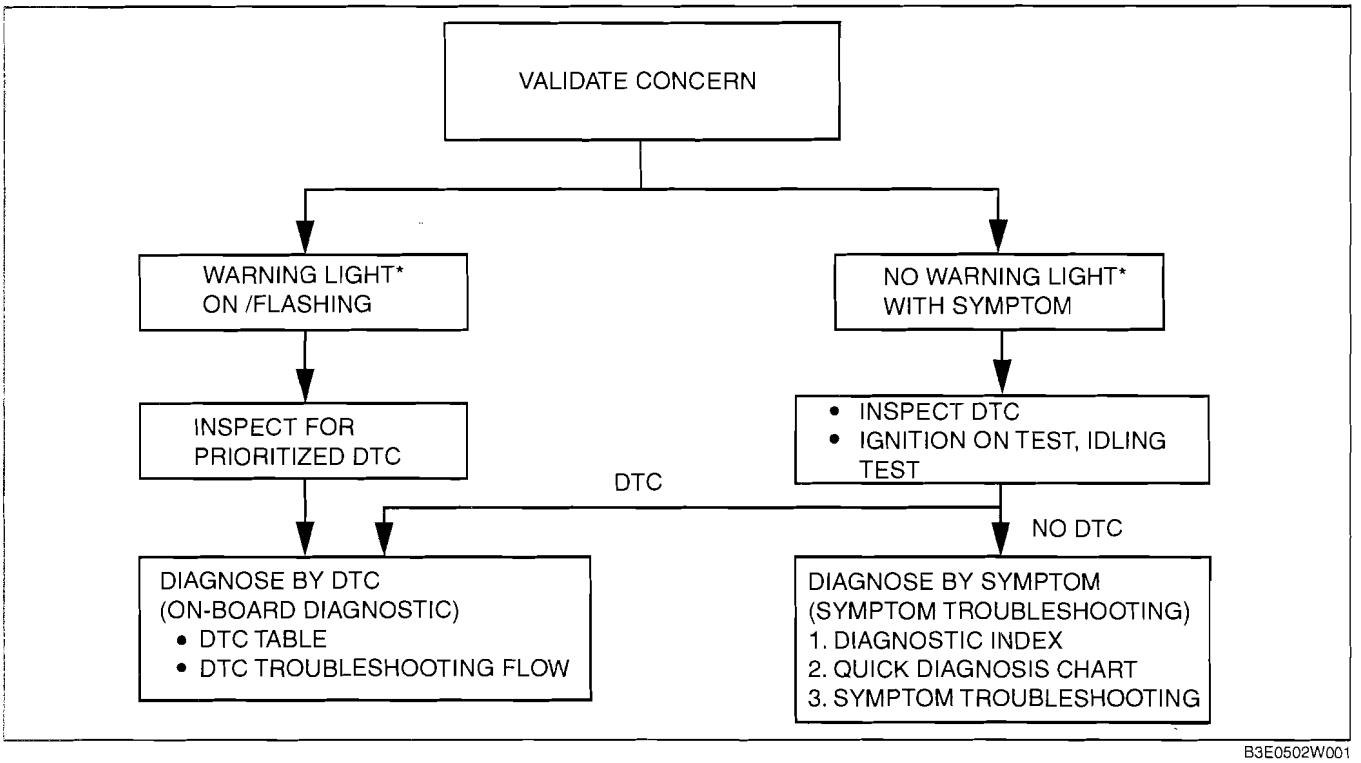


E3U140ZW6006

FOREWORD[FN4A-EL]

id0502a1800200

- When the customer reports a vehicle malfunction, inspect the malfunction indicator lamp (MIL), AT warning light indication, and PCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  — If a DTC exists, diagnose the applicable DTC. (See 05-02A-11 DTC TABLE[FN4A-EL].)
  — If no DTC exists, the MIL does not illuminate, and AT warning light does not illuminate. Diagnose the applicable symptom troubleshooting. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)



B3E0502W001

*: Malfunction indicator lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION[FN4A-EL]

id0502a1800300

DTC Reading Procedure

(See 01-02A-14 ON-BOARD DIAGNOSTIC TEST[LF, L3].)

AFTER REPAIR PROCEDURE[FN4A-EL]

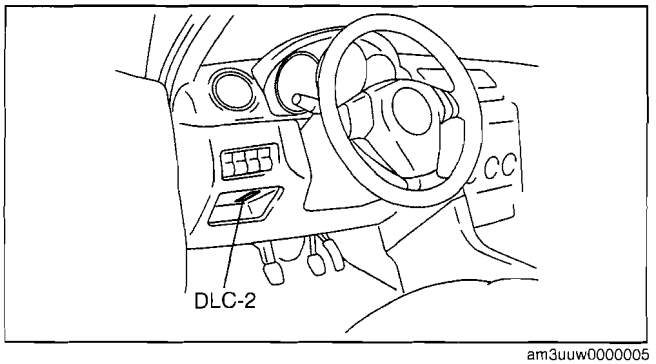
id0502a1800400

Caution

- **After repairing a malfunction, perform the following procedure to verify that the malfunction has been corrected.**
- **When performing this procedure, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "SelfTest".
  3. Select "Modules".
  4. Select "PCM".
  5. Select "Retrieve CMDTCs".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "PCM".
  3. Select "SelfTest".
  4. Select "Retrieve CMDTCs".



am3uuw0000005

3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Perform the following DTC inspections to ensure that the DTCs have been resolved:

DTC No.	inspection
P0706, P0707, P0708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **20 km/h {12 mph} or more** for **100 s or more**. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range at **20 km/h {12 mph} or more** for **100 s or more**. vii. Go to Step 6.
P0711	i. Start the engine then wait **180 s or more**. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **25 km/h {16 mph} or more** for **90 s or more**. iv. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Drive the vehicle in D range, at **25 km/h {16 mph} or more** for **90 s or more**. viii. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. ix. Go to Step 6.
P0712, P0713	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **20 km/h {12 mph} or more** for **150 s or more**. iv. Go to Step 6.
P0715	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **41 km/h {25 mph} or more** for **0.7 s or more**. iv. Go to Step 6.
P0720	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0731	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 1GR • Accelerator opening angle (APP PID): **3.07% or more** iv. Go to Step 6.
P0732	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 3 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 2GR iv. Go to Step 6.
P0733	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 3GR iv. Go to Step 6.
P0734	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {23 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 4GR iv. Go to Step 6.

DTC No.	inspection
P0741	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Go to Step 6.
P0742	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. iv. Go to Step 6.
P0745	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range. iv. Go to Step 6.
P0751	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.
P0752	i. Start the engine. ii. Warm up the engine and ATX. iii. Selector lever position: D range iv. Depress the brake pedal. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Selector lever position: D range viii. Depress the brake pedal. ix. Go to Step 6.
P0753, P0758, P0763, P0768, P0773, P0883, P1783	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR and TCC is operated. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR and TCC is operated. vii. Go to Step 6.

DTC No.	inspection
P0756	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0757, P0766	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR vii. Go to Step 6.
P0761	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR vii. Go to Step 6.
P0762	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR vii. Go to Step 6.

DTC No.	inspection
P0767	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more**. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0771	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more**. • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR and TCC is operated iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more**. • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR and TCC is operated vii. Go to Step 6.
P0772	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): less than **70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. vii. Go to Step 6.
P0894	i. Start the engine. ii. Warm up the engine and ATX. iii. Depress the brake pedal. iv. Throttle opening angle at closed throttle position. v. Shift the selector lever from the N position to the D range and hold for **3 s or more**. vi. Go to Step 7.

6. Gradually slow down and stop the vehicle.
7. Make sure that the repaired DTC does not recur.

DTC TABLE[FN4A-EL]

id0502a1800500

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
B1342	PCM malfunction	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0011	CMP timing over-advanced	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0012	CMP timing over-retarded	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0016	CKP-CMP correlation	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0030	Front HO2S heater control circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0031	Front HO2S heater circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0032	Front HO2S heater circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0037	Middle HO2S heater circuit low input*1 Rear HO2S heater circuit low input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0038	Middle HO2S heater circuit high input*1 Rear HO2S heater circuit high input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0043*1	Rear HO2S heater circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0044*1	Rear HO2S heater circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0069	Manifold absolute pressure/atmospheric pressure correlation	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0101	MAF sensor circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0102	MAF sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0103	MAF sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0107	MAP sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0108	MAP sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0111	IAT sensor circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0112	IAT sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0113	IAT sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0116	Engine coolant temperature circuit range/ performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0117	ECT sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0118	ECT sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0122	TP sensor No.1 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0123	TP sensor No.1 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0125	Excessive time to enter closed loop fuel control	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0126	Coolant thermostat stuck open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0128		(See 01-02A-22 DTC TABLE[LF, L3].)					
P0130*1	Front HO2 circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0131	Front HO2S circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0132	Front HO2S circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0133	Front HO2S circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0134	Front HO2S no activity detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0137*2	Rear HO2S circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0138	Middle HO2S circuit high input*1 Rear HO2S circuit high input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0139	Middle HO2S circuit problem*1 Rear HO2S circuit problem*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0140*2	Rear HO2S no activity detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0144*1	Rear HO2S circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0171*1	Fuel trim system too lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0172*1	Fuel trim system too rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0222	TP sensor No.2 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0223	TP sensor No.2 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0300	Random misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0301	Cylinder No.1 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0302	Cylinder No.2 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0303	Cylinder No.3 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0304	Cylinder No.4 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0327	KS circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0328	KS circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0335	CKP sensor circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0340	CMP sensor circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0401	EGR flow insufficient detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0403	EGR valve (stepper motor) circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0421	Warm up catalyst system efficiency below threshold	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0441	Evaporative emission control system incorrect purge flow	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0442	Evaporative emission control system leak detected (small leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0443	Purge solenoid valve circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0455	Evaporative emission control system leak detected (gross leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0456*1	Evaporative emission system leak detected (very small leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0461	Fuel gauge sender unit circuit range/ performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0462	Fuel gauge sender unit circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0463	Fuel gauge sender unit circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0480	Fan control circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0500	VSS circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0505	IAC system problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0506	Idle control system RPM lower than expected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0507	Idle control system RPM higher than expected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P050A	Cold start idle air control system performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P050B	Cold start ignition timing performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0564	Cruise control switch circuit malfunction	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0571	Brake switch circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0601	PCM memory check sum error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0602	PCM programming error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0604	PCM RAM error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0606	ECM/PCM processor	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0607*2	PCM performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0610	PCM vehicle options error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0638	Throttle actuator control range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0661	Variable intake air solenoid valve circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0662	Variable intake air solenoid valve circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0703	Brake switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0704	Clutch pedal position (CPP) switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0706	Transaxle range (TR) switch circuit range/ performance	ON	YES	2	CCM	X	(See 05-02A-17 DTC P0706[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	X	(See 05-02A-18 DTC P0707[FN4A-EL].)
P0708	Transaxle range (TR) switch circuit high input	ON	YES	1	CCM	X	(See 05-02A-20 DTC P0708[FN4A-EL].)
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	ON	NO	2	CCM	X	(See 05-02A-22 DTC P0711[FN4A-EL].)
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	X	(See 05-02A-24 DTC P0712[FN4A-EL].)
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	X	(See 05-02A-26 DTC P0713[FN4A-EL].)
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02A-28 DTC P0715[FN4A-EL].)
P0720	VSS circuit malfunction	ON	YES	2	CCM	X	(See 05-02A-31 DTC P0720[FN4A-EL].)
P0731	Gear 1 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-34 DTC P0731[FN4A-EL].)
P0732	Gear 2 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-36 DTC P0732[FN4A-EL].)
P0733	Gear 3 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-38 DTC P0733[FN4A-EL].)
P0734	Gear 4 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-40 DTC P0734[FN4A-EL].)
P0741	Torque converter clutch (TCC) (stuck off)	OFF	YES	1	CCM	X	(See 05-02A-42 DTC P0741[FN4A-EL].)
P0742	Torque converter clutch (TCC) (stuck on)	OFF	YES	1	CCM	X	(See 05-02A-44 DTC P0742[FN4A-EL].)
P0745	Pressure control solenoid malfunction	OFF	YES	1	CCM	X	(See 05-02A-46 DTC P0745[FN4A-EL].)
P0751	Shift solenoid A stuck off	ON	YES	2	CCM	X	(See 05-02A-48 DTC P0751[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0752	Shift solenoid A stuck on	ON	YES	2	CCM	X	(See 05-02A-50 DTC P0752[FN4A-EL].)
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-52 DTC P0753[FN4A-EL].)
P0756	Shift solenoid B stuck off	ON	YES	2	CCM	X	(See 05-02A-54 DTC P0756[FN4A-EL].)
P0757	Shift solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02A-56 DTC P0757[FN4A-EL].)
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-58 DTC P0758[FN4A-EL].)
P0761	Shift solenoid C stuck off	ON	YES	2	CCM	X	(See 05-02A-60 DTC P0761[FN4A-EL].)
P0762	Shift solenoid C stuck on	ON	YES	2	CCM	X	(See 05-02A-62 DTC P0762[FN4A-EL].)
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-64 DTC P0763[FN4A-EL].)
P0766	Shift solenoid D stuck off	ON	YES	2	CCM	X	(See 05-02A-66 DTC P0766[FN4A-EL].)
P0767	Shift solenoid D stuck on	OFF	YES	2	CCM	X	(See 05-02A-68 DTC P0767[FN4A-EL].)
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-70 DTC P0768[FN4A-EL].)
P0771	Shift solenoid E stuck off	ON	YES	2	CCM	X	(See 05-02A-72 DTC P0771[FN4A-EL].)
P0772	Shift solenoid E stuck on	ON	YES	2	CCM	X	(See 05-02A-74 DTC P0772[FN4A-EL].)
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-76 DTC P0773[FN4A-EL].)
P0850	Neutral switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0883	Battery voltage high	ON	YES	1	CCM	X	(See 05-02A-78 DTC P0883[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0894	Forward clutch torque transmission	OFF	YES	1	CCM	X	(See 05-02A-79 DTC P0894[FN4A-EL].)
P1260	Immobilizer system problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P1783	ATF high oil temperature malfunction	OFF	YES	1	CCM	X	(See 05-02A-80 DTC P1783[FN4A-EL].)
P2004	Variable tumble shutter valve stuck open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2006	Variable tumble shutter valve stuck closed	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2009	Variable tumble solenoid valve circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2010	Variable tumble solenoid valve circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2088	Oil control valve (OCV) circuit low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2089	Oil control valve (OCV) circuit high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2096	Target A/F feedback system too lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2097	Target A/F feedback system too rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2100*2	Throttle actuator circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2101	Throttle actuator circuit range/performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2102*2	Throttle actuator circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2103*2	Throttle actuator circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2107	Throttle actuator control module processor error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2108	Throttle actuator control module performance error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2109*1	TP sensor minimum stop range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2112*1	Throttle actuator control system range/ performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2119	Throttle actuator control throttle body range/ performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2122	Accelerator pedal position (APP) sensor No.1 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2123	Accelerator pedal position (APP) sensor No.1 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2126	Accelerator pedal position (APP) sensor No.2 circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2127	Accelerator pedal position (APP) sensor No.2 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2128	Accelerator pedal position (APP) sensor No.2 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2135	Throttle position sensor No.1/No.2 voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2138	Accelerator pedal position (APP) sensor No.1/ No.2 voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2177*2	Fuel system too lean at off idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2178*2	Fuel system too rich at off idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2187*2	Fuel system too lean at idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2188*2	Fuel system too rich at idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2195	Front HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2196	Front HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2228	BARO sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2229	BARO sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2237*2	Front HO2S positive current control circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2251*2	Front HO2S negative current control circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P2270*1	Middle HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2271*1	Middle HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2274*1	Rear HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2275*1	Rear HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2401	EVAP system leak detection pump motor circuit low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2402	EVAP system leak detection pump motor circuit high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2404	EVAP system leak detection pump sense circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2405	EVAP system leak detection pump sense circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2407	EVAP system leak detection pump sense circuit intermittent	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2502	Charging system voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2503	Charging system voltage low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2504	Charging system voltage high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2507	PCM B+ voltage low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2610	PCM internal engine off timer performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
U0073	CAN system communication error	(See 01-02A-22 DTC TABLE[LF, L3].)					
U0101	Communication error to PCM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					
U0121	Communication error to ABS HU/CM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					
U0155	Communication error to instrument cluster	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

DTC P0706[FN4A-EL]

id0502a1800900

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Engine speed **530 rpm or more** — Vehicle speed **20 km/h {12 mph} or more** — Voltage at PCM terminal 1AH*1/1S*2 **0.5 V or more** — P, R, N, or D range/position not detected **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

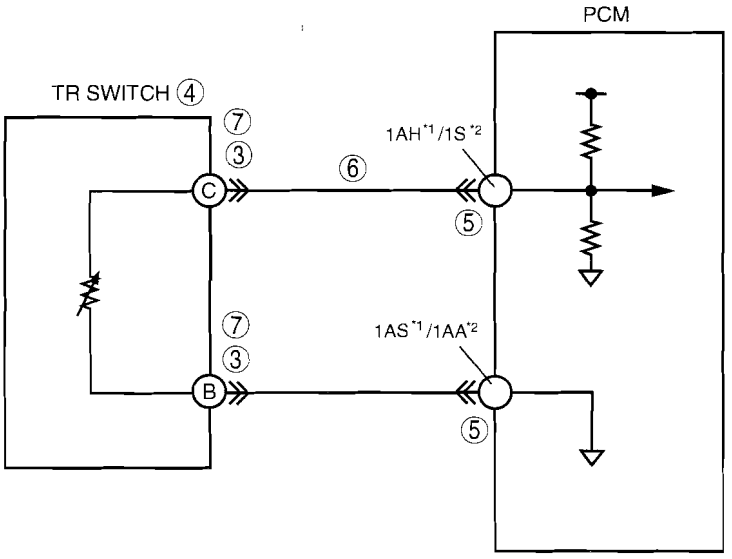
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Adjust or replace the TR switch, then go to the next step. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].) (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in each range (D and R) for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

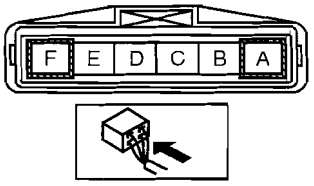
DTC P0707[FN4A-EL]

id0502a1801000

DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at PCM terminal 1AH*1/1S*2 **0.5 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Short to ground in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • TR switch signal and TR switch ground circuits shorted each other • PCM malfunction

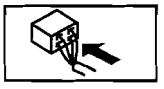


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

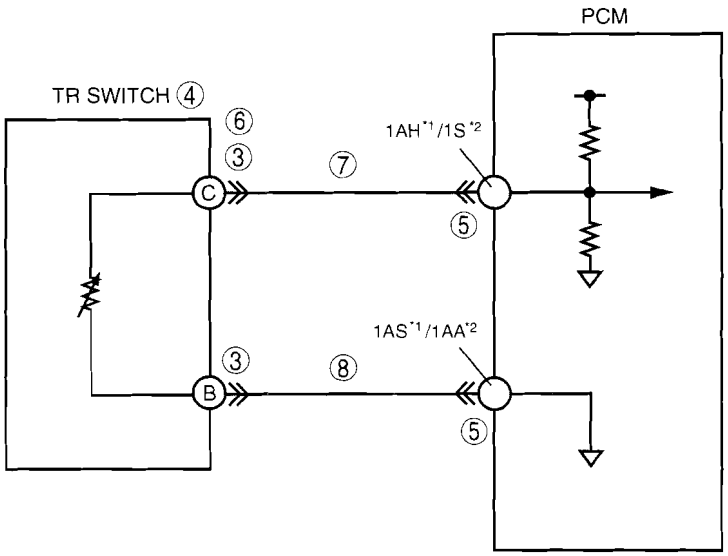
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection at TR switch terminals B and C (part-side) (such as damaged/pulled-out pins, corrosion) • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 8. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 8. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminals 1AH*1/1S*2 and 1AS*1/1AA*2 (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between TR switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT CIRCUIT** • Inspect for continuity between TR switch terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short circuit, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

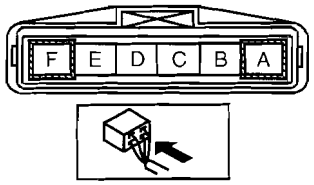
DTC P0708[FN4A-EL]

id0502a1801100

DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at PCM terminal 1AH*1/1S*2 **4.79 V or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Open circuit in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • Short to power supply in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • Open circuit in wiring harness between TR switch terminal B and PCM terminal 1AS*1/1AA*2 • Poor connection of TR switch or PCM connectors • PCM malfunction

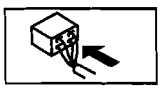


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 9. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**INSPECT TR SWITCH** • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 9. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminals 1AH*1/ 1S*2 and 1AS*1/1AA*2 (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to step 9.
		No	Go to the next step.
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between TR switch terminal C and (wiring harness-side) body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal C (wiring harness-side) and PCM terminal 1AH*1/1S*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to step 9.
8	**INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal B (wiring harness-side) and PCM terminal 1AS*1/1AA*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID) **530 rpm or more** — Vehicle speed (VSS PID) **20 km/h {12 mph} or more** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0711[FN4A-EL]

id0502a1801200

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	• When all conditions below are satisfied. — When **180 s or more** have passed after the engine is started, vehicle is driven for **90 s or more** at vehicle speed **25 km/h {16 mph} or more**, then **60 km/h {37 mph} or more** for **60 s or more**. — D range of TR switch input — Opened accelerator position — P0712, P0713 not output — Variation in ATF voltage **less than 0.03 V** • When the detected ATF temperature is **less than 20°C {68 °F}** together with the following conditions. — Intake air temperature is **-7 °C {19.4 °F} or more** after engine starts. — Estimated ATF temperature is **more than 55° C {131 °F}** while vehicle is driving. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • AT warning light does not illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/1U*2. • Record terminal 2AC*1/1U*2 voltage. • Start the engine. • Drive the vehicle at **60 km/h {37 mph} or more** for **330 s or more**. • Record terminal 2AC*1/1U*2 voltage again. • Is the variation in voltage **0.03 V or more**?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect terminals for corrosion. • Are terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to the next step.

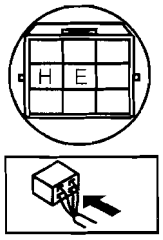
STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Decrease ATF temperature to **20 °C {68 °F} or less**. • Start the engine and wait for **180 s or more**. • Drive the vehicle at a vehicle speed **25 km/h {16 mph} or more** for **90 s or more**. • Drive the vehicle at a vehicle speed **60 km/h {37 mph} or more** for **60 s or more**. • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

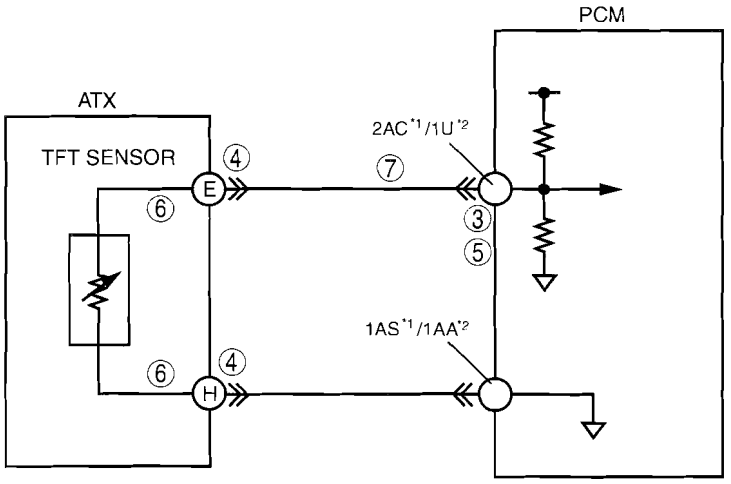
DTC P0712[FN4A-EL]

id0502a1801300

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• If the PCM detects either of the following conditions for **150 s or more**, the PCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **0.06 V or less** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Short to ground in wiring harness between TFT sensor and ATX terminal E • Short to ground in wiring harness between TFT sensor and ATX terminal H • Short to ground in wiring harness between ATX terminal E and PCM terminal 2AC*1/1U*2 • Damaged connectors between TFT sensor and PCM • PCM malfunction

TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR

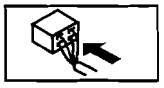




PCM WIRING HARNESS-SIDE CONNECTOR

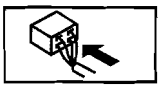
2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B

2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B

1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

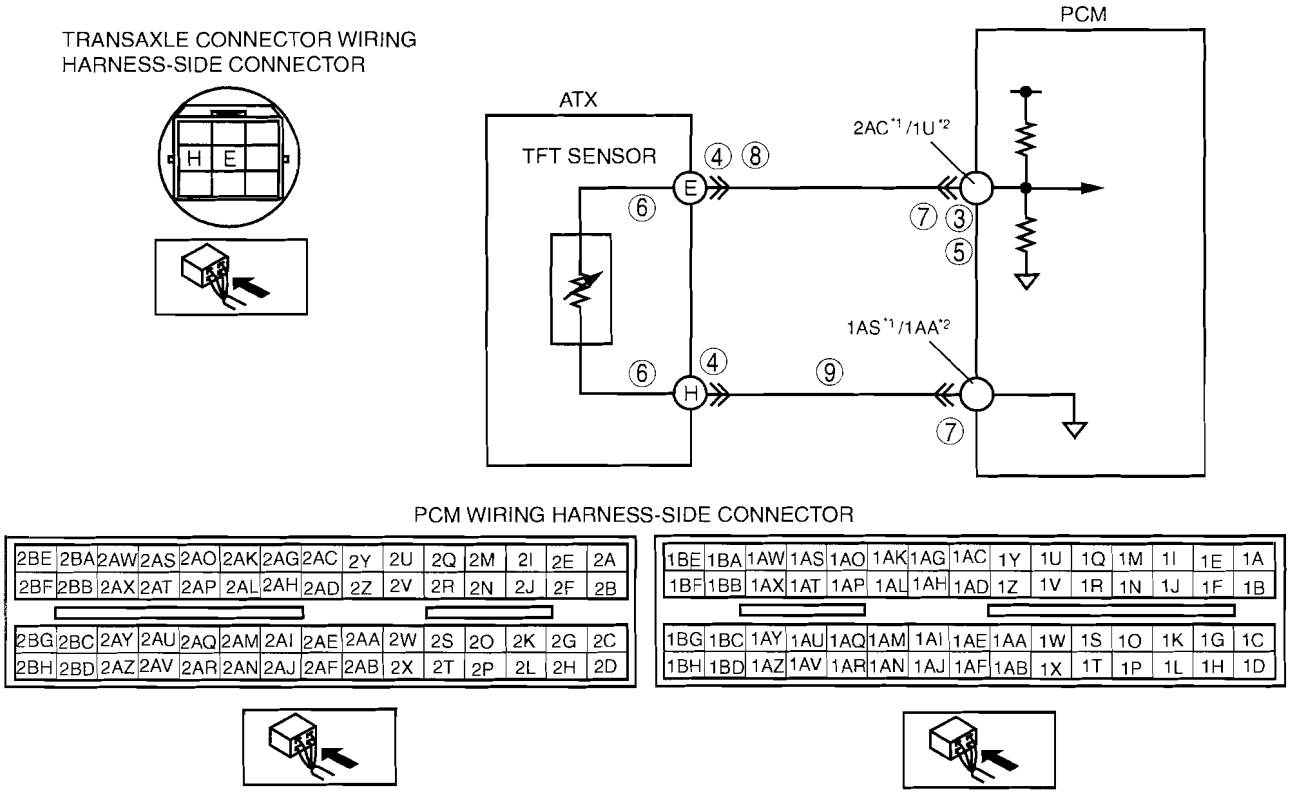
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at PCM terminal 2AC*1/1U*2. • Is the voltage **0.06 V or more**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Are the terminals bent?	Yes	Repair or replace the terminals, then go to Step 8. • If the terminals cannot be repaired, replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Verify that the voltage changes to **4.67 V or more** at PCM terminal 2AC*1/1U*2 when ATX connector is disconnected. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between ATX terminals (transaxle case side) and body ground. — E and body ground — H and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Replace the TFT sensor, then go to Step 8. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more.** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0713[FN4A-EL]

id0502a1801400

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• If the PCM detects the following condition for **150 s or more**, the PCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **4.67 V or more** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit in wiring harness between TFT sensor and ATX terminal E • Open circuit in wiring harness between TFT sensor and ATX terminal H • Open circuit in wiring harness between ATX terminal E and PCM terminal 2AC*1/1U*2 • Open circuit in wiring harness between ATX terminal H and PCM terminal 1AS*1/1AA*2 • Damaged connectors between TFT sensor and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

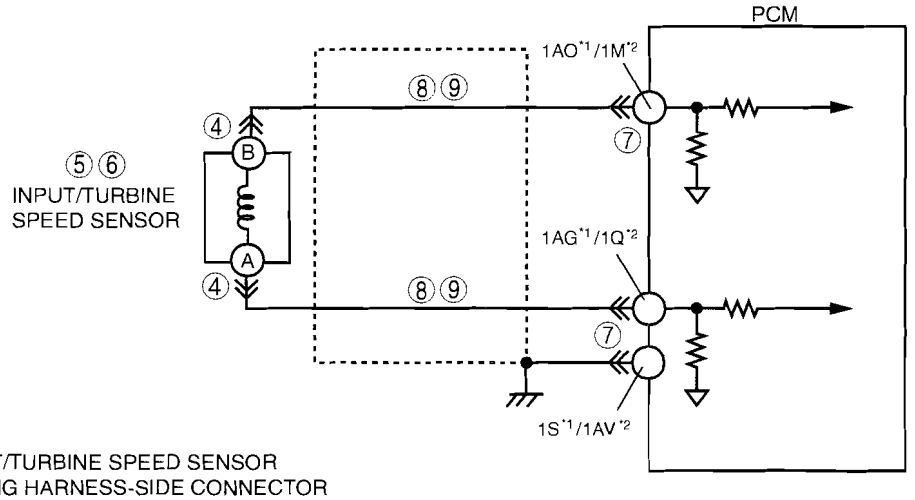
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/ 1U*2. • Is the voltage **below 4.67 V**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Inspect ATX connector connection. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/ 1U*2 when connect between ATX terminals E and H (wiring harness-side) using jumper wire. • Verify that voltage changes to **0.06 V or less**. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between ATX terminals (transaxle case side) E and H. • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 10. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
		No	Repair or replace the wiring harness, then go to Step 10.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT WIRING HARNESS FOR OPEN CIRCUIT** • Disconnect the ATX connector. • Connect the PCM connector. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal E (vehicle wiring harness-side). • Is the voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal H (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

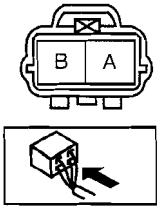
DTC P0715[FN4A-EL]

id0502a1806100

DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• When all conditions below are satisfied and **0.7 s or more** have passed. — D range of TR switch input — Driving vehicle at vehicle speed of **41 km/h {25 mph} or more** — Input/turbine speed sensor signal not input **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground in wiring harness between input/turbine speed sensor terminal A and PCM terminal 1AG*1/1Q*2 • Short to ground in wiring harness between input/turbine speed sensor terminal B and PCM terminal 1AO*1/1M*2 • Open circuit in wiring harness between input/turbine speed sensor terminal A and PCM terminal 1AG*1/1Q*2 • Open circuit in wiring harness between input/turbine speed sensor terminal B and PCM terminal 1AO*1/1M*2 • Damaged connectors between input/turbine speed sensor and PCM • PCM malfunction

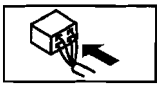


INPUT/TURBINE SPEED SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

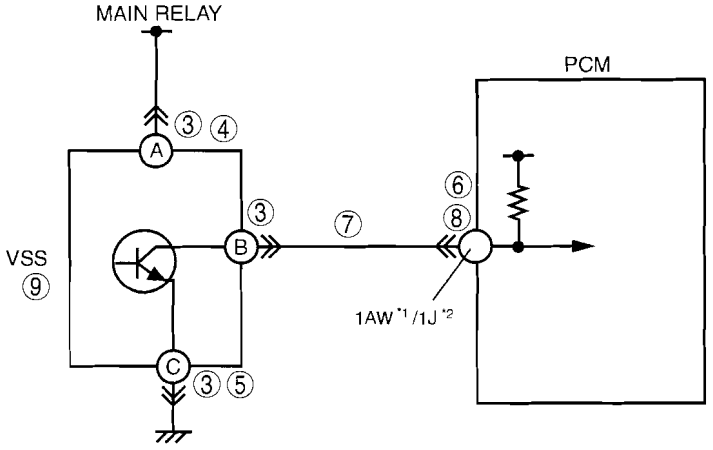
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the LOCK position. • Start the engine. • Measure the frequency of input/turbine speed sensor using a oscilloscope. — IG ON: **0 Hz** — Idle: **Within 320—374 Hz** (P, N position) • Are frequencies of input/turbine speed sensor within specifications?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the input/turbine speed sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between the input/ turbine speed sensor terminals (part-side). • Is the resistance **within 250—600 ohms** between input/turbine speed sensor terminals (part-side)? (See 05-17A-20 INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the input/turbine speed sensor, then go to Step 10. (See 05-17A-21 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
6	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove the input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See 05-17A-21 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL].)	Yes	Clean the input/turbine speed sensor, then go to Step 10.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect the following input/turbine speed sensor terminals (wiring harness-side) and PCM terminals (wiring harness-side): — A and 1AG[*1]/1Q[*2] — B and 1AO[*1]/1M[*2] • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal (wiring harness-side) and body ground. — A and body ground — B and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle a vehicle speed **41 km/h {25 mph} or more** for **0.7 s or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

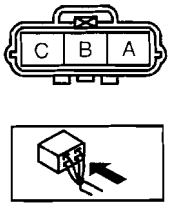
DTC P0720[FN4A-EL]

id0502a1809800

DTC P0720	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Vehicle speed signal is not input after the following conditions are met and **4.5 s or more** have passed: — D range switch ON — Engine coolant temperature **60 °C {140 °F} or more** — Turbine speed **1,500 rpm or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VSS malfunction • Open circuit between VSS terminal B and PCM terminal 1AW*1/1J*2 • Short to ground between VSS terminal B and PCM terminal 1AW*1/1J*2 • Open circuit between VSS terminal A and main relay • Open circuit between VSS terminal C and body ground • Damaged connectors between VSS and PCM • PCM malfunction

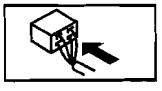


VSS WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the VSS connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that VSS connector is disconnected. • Turn ignition switch to ON (engine off). • Inspect the voltage between VSS terminal A (harness-side) and ground. • Is voltage reading **B+**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
5	**INSPECT VSS GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Verify that VSS connector is disconnected. • Inspect for continuity between VSS terminal C (harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
7	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the PCM connector and VSS connector. • Inspect for continuity between VSS terminal B and PCM terminal 1AW*1/1J*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
8	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that VSS connector and PCM connector are disconnected. • Inspect for continuity between PCM harness side connector and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.
9	**INSPECT VEHICLE SPEEDOMETER SENSOR** • Inspect VSS. (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL].) • Is VSS normal?	Yes	Go to the next step.
		No	Repair or replace the VSS, then go to Step 11.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using M-MDS. • Warm up engine. • Drive vehicle under following conditions for **4.5 s or more** while monitoring PIDs. — Engine coolant temp: **60 °C {140 °F} or more** — Drive in M range — Frequency of input/turbine speed sensor: **800 Hz or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0731[FN4A-EL]

id0502a1801900

DTC P0731	Gear 1 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors the revolution ratio of the forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or less**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Accelerator opening angle **3.07% or more** — Differential gear case (output) revolution speed **35 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Pressure control solenoid stuck • Line pressure low • One-way clutch slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID A** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A when applying B+ to transaxle terminal A. • Was a click heard from solenoid?	Yes	Go to the next step.
		No	Replace the solenoid that you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **20 km/h {12 mph}** — Drive in the D range, 1GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,100 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0731** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 1GR — Accelerator opening angle (APP PID): **3.07% or more** — Vehicle speed (VSS PID): **4 km/h {3 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0732[FN4A-EL]

id0502a1802000

DTC P0732	Gear 2 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **1.249 or less** or **2.157 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 2 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID A, B AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A, B, and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **40 km/h {24 mph}** — Drive in the D range, 2GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,156 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 2GR — Vehicle speed (VSS PID): **3.8 km/h {2.4 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0733[FN4A-EL]

id0502a1802100

DTC P0733	Gear 3 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.863 or less**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 1.345—1.644**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **23 km/h {14.3 mph} or more** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A or C stuck • Pressure control solenoid stuck • Line pressure low • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass, TCC or 3-4 shift valve) • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.

STEP	INSPECTION		ACTION
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID A AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **60 km/h {37 mph}** — Drive in the D range, 3GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0733** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 2 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 3GR — Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0734[FN4A-EL]

id0502a1802200

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of the forward clutch drum revolution to the differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.6 or less** or **1.249 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 4 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **36 km/h {23 mph} or more** — Closed accelerator position — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of the forward clutch drum revolution to the differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 0.91—1.09**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 4 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **46 km/h {29 mph} or more** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass or 3-4 shift valve) • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.

STEP	INSPECTION		ACTION
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID A AND D FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoids A and D when applying B+ to each transaxle terminal. **Note** • The click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0734** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR — Accelerator opening angle (APP PID): **0%** — Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0741[FN4A-EL]

id0502a1807900

DTC P0741	Torque converter clutch (TCC) stuck off
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — Torque converter clutch (TCC) operating — Shift solenoid A duty value exceeds **99%** — Difference between engine speed and turbine speed **more than 100 rpm** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions for **10 s or more**. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC operation) — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0742[FN4A-EL]

id0502a1808000

DTC P0742	Torque converter clutch (TCC) stuck on
DETECTION CONDITION	• All of the following conditions are satisfied under each of the following accelerator conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **less than 70 km/h {43 mph}** — Torque converter clutch (TCC) no operating — Difference between engine speed and turbine speed **less than 50 rpm** — DTC P0734 not output — Accelerator conditions • Accelerator opening angle (APP PID) is **more than 6.25%** and **5 s or more** have passed. • Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. • Accelerator opening angle is at closed accelerator position and **5 s or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

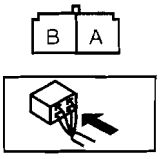
STEP	INSPECTION		ACTION
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC not in operation) — Vehicle speed: **less than 70 km/h {43 mph}**. — Accelerator conditions • Accelerator opening angle (APP PID) **more than 6.25%** and **5 s or more** have passed. • Accelerator opening angle (APP PID) **within 3.13—6.25%** and **3 s or more** have passed. • Accelerator opening angle at closed accelerator position and **5 s or more** have passed. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0745[FN4A-EL]

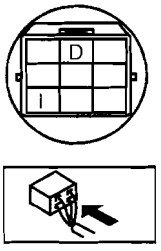
id0502a1806600

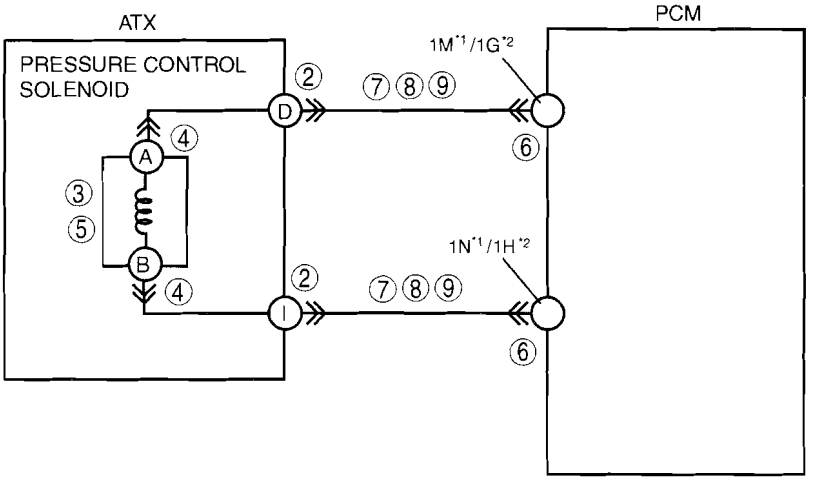
DTC P0745	Pressure control solenoid malfunction
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that pressure control solenoid circuit has a malfunction. — Pressure control solenoid voltage stuck **0 V** after engine start — Pressure control solenoid voltage stuck **B+** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Pressure control solenoid malfunction • Open circuit in wiring harness between pressure control solenoid terminal B and ATX terminal I • Open circuit in wiring harness between ATX terminal I and PCM terminal 1N*1/1H*2 • Short to ground in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Short to power supply in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Open circuit in wiring harness between pressure control solenoid terminal A and ATX terminal D • Open circuit in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Damaged connector between pressure control solenoid and PCM • PCM malfunction

PRESSURE CONTROL SOLENOID WIRING HARNESS-SIDE CONNECTOR



TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
3	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminals D and I (transaxle case side). • Is the resistance **within 2.4—7.3 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 6.
		No	Go to the next step.
4	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT RESISTANCE** • Inspect the resistance between the pressure control solenoid terminals A and B. • Is the resistance **within 2.4—7.3 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 10.
		No	Verify pressure control solenoid installation. • If solenoid installed correctly, replace the pressure control solenoid, then go to Step 10. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
7	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the PCM (wiring harness-side) and ATX connector (wiring harness-side). — PCM terminal 1M*1/1G*2 and ATX terminal D — PCM terminal 1N*1/1H*2 and ATX terminal I • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, the go to Step 10.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal D (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Make sure to wait **more than 1 s** after turning the ignition switch to the ON position. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0751[FN4A-EL]

id0502a1808100

DTC P0751	Shift solenoid A stuck off
DETECTION CONDITION	• When P0731, P0732, and P0733 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225— 4,987 rpm** — Vehicle speed **46 km/h {29 mph} or more** — Differential gear case (output) revolution speed **35 rpm or more** — Torque converter clutch (TCC) not operating — Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.91—1.09** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0752[FN4A-EL]

id0502a1808200

DTC P0752	Shift solenoid A stuck on
DETECTION CONDITION	• When P0734 is not output, and all conditions below are satisfied in 1GR and 2GR. — ATF temperature **20 °C {68 °F} or more** — Engine running — D range selected — Brake pedal depressed — Accelerator opening angle at closed accelerator position — Vehicle speed **0 km/h {0 mph}** — Input/turbine speed sensor signal **187.5 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

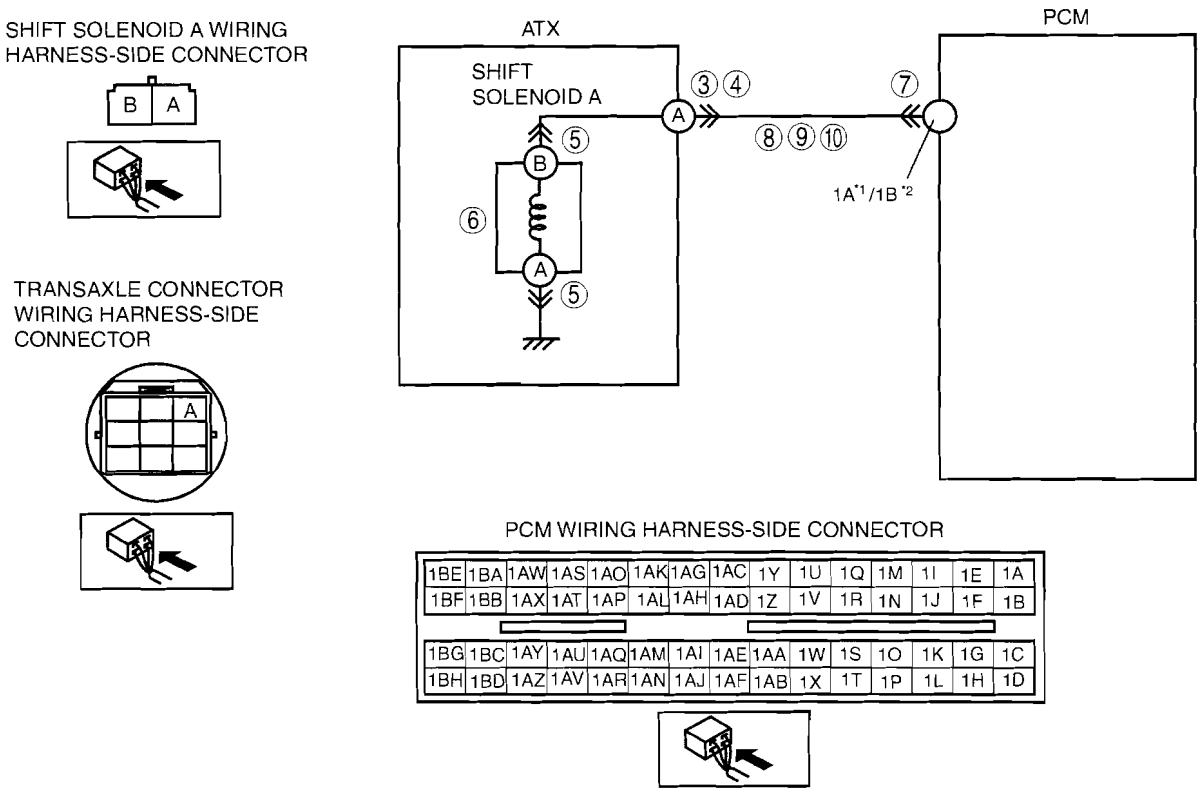
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0753[FN4A-EL]

id0502a1808300

DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions, PCM determines that shift solenoid A circuit has a malfunction. — Shift solenoid A voltage stuck at **B+** after engine start — Shift solenoid A voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Short to ground in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Short to power supply in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Open circuit in wiring harness between shift solenoid A terminal B and ATX terminal A • Open circuit in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Open circuit in wiring harness between shift solenoid A terminal A and body ground • Damaged connector between shift solenoid A and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal A (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid A connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid A terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid A installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1A*1/1B*2 (wiring harness-side) and ATX terminal A (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal A (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1A*1/1B*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0756[FN4A-EL]

id0502a1808400

DTC P0756	Shift solenoid B stuck off
DETECTION CONDITION	• When DTC P0732, P0733, and P0734 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — Accelerator opening angle (APP PID) **3.07% or more** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **300 rpm or more** — Accelerator opening angle (APP PID): **3.07% or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0757[FN4A-EL]

id0502a1808500

DTC P0757	Shift solenoid B stuck on
DETECTION CONDITION	• When DTC P0731 and P0733 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 2GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **1.249 or less** or **2.157 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied with driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Vehicle speed **36 km/h {22 mph}** • Accelerator opening angle at closed accelerator position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.6 or less** or **1.249 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

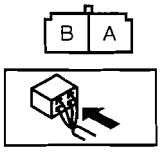
STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **300 rpm or more** — Accelerator opening angle (APP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **36 km/h {22 mph} or more** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0758[FN4A-EL]

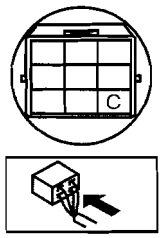
id0502a1808600

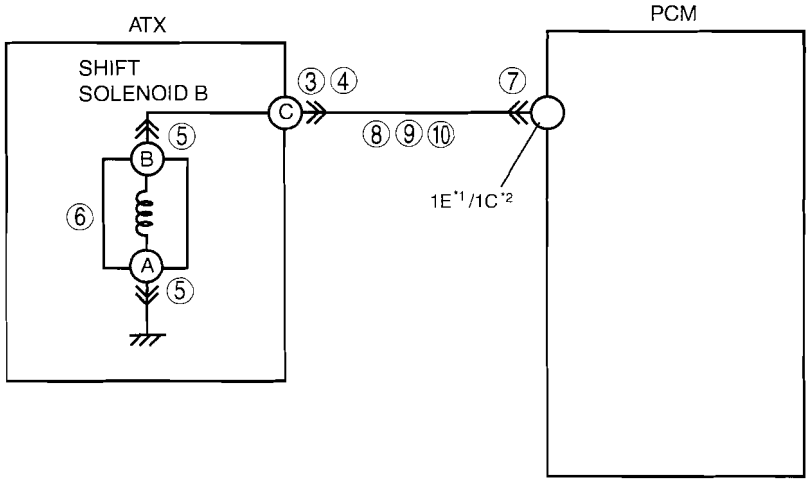
DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that shift solenoid B circuit has a malfunction. — Shift solenoid B voltage stuck at **B+** after engine start — Shift solenoid B voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Short to ground in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Short to power supply in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Open circuit in wiring harness between shift solenoid B terminal B and ATX terminal C • Open circuit in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Open circuit in wiring harness between shift solenoid B terminal A and body ground • Damaged connector between shift solenoid B and PCM • PCM malfunction

SHIFT SOLENOID B WIRING HARNESS-SIDE CONNECTOR

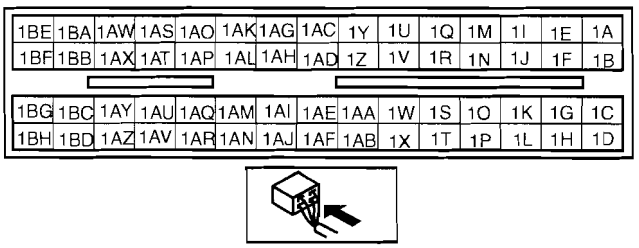


TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal C (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid B connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid B terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid B installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1E*1/1C*2 (wiring harness-side) and ATX terminal C (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect for voltage at ATX terminal C (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1E*1/1C*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0761[FN4A-EL]

id0502a1808700

DTC P0761	Shift solenoid C stuck off
DETECTION CONDITION	• When DTC P0733 and P0734 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 2GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **1.249 or less** or **2.157or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that the gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Accelerator opening angle (APP PID): **3.07% or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0762[FN4A-EL]

id0502a1808800

DTC P0762	Shift solenoid C stuck on
DETECTION CONDITION	• When DTC P0731 and P0732 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 3GR. • ATF temperature **20 °C {68 °F} or more**. • Driving in D range • Engine running • Turbine speed **within 225—4,987 rpm** • Vehicle speed **23 km/h {14.3 mph} or more** • Torque converter clutch (TCC) no operating • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 1.345—1.644** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C and pressure control solenoid stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

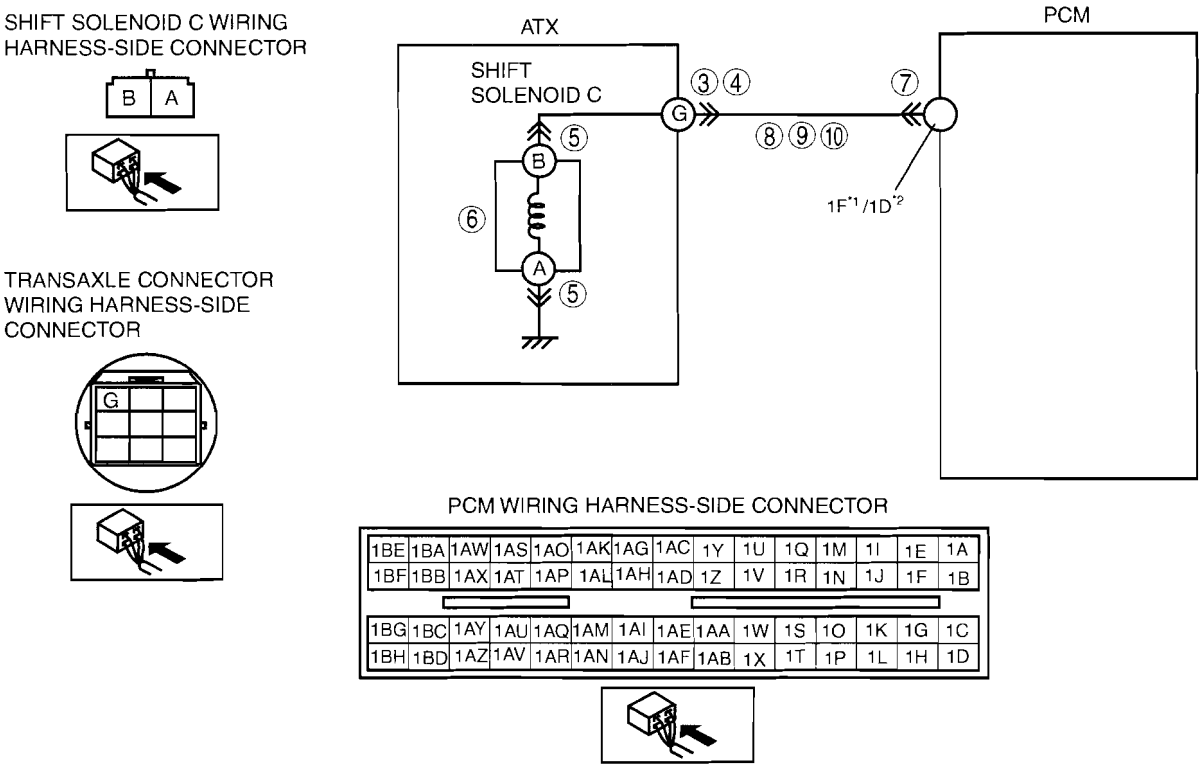
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0763[FN4A-EL]

id0502a1808900

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that shift solenoid C circuit has a malfunction. — Shift solenoid C voltage stuck at **B+** after engine start — Shift solenoid C voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Short to ground in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Short to power supply in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Open circuit in wiring harness between shift solenoid C terminal B and ATX terminal G • Open circuit in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Open circuit in wiring harness between shift solenoid C terminal A and body ground • Damaged connector between shift solenoid C and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal G (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid C connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid C terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid C installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1F*1/1D*2 (wiring harness-side) and ATX terminal G (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal G (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1F*1/1D*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0766[FN4A-EL]

id0502a1809000

DTC P0766	Shift solenoid D stuck off
DETECTION CONDITION	• When any of DTC P0732, and P0733 not output (correct judgment), and all conditions below are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Vehicle speed **36 km/h {23 mph} or more** • Accelerator opening angle at closed accelerator position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.6 or less** or **1.249 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the M range — Accelerator opening angle (APP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **36 km/h {23 mph} or more** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0767[FN4A-EL]

id0502a1809100

DTC P0767	Shift solenoid D stuck on
DETECTION CONDITION	• When any of DTC P0731, P0732, P0734, and P0741 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 3GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.863 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

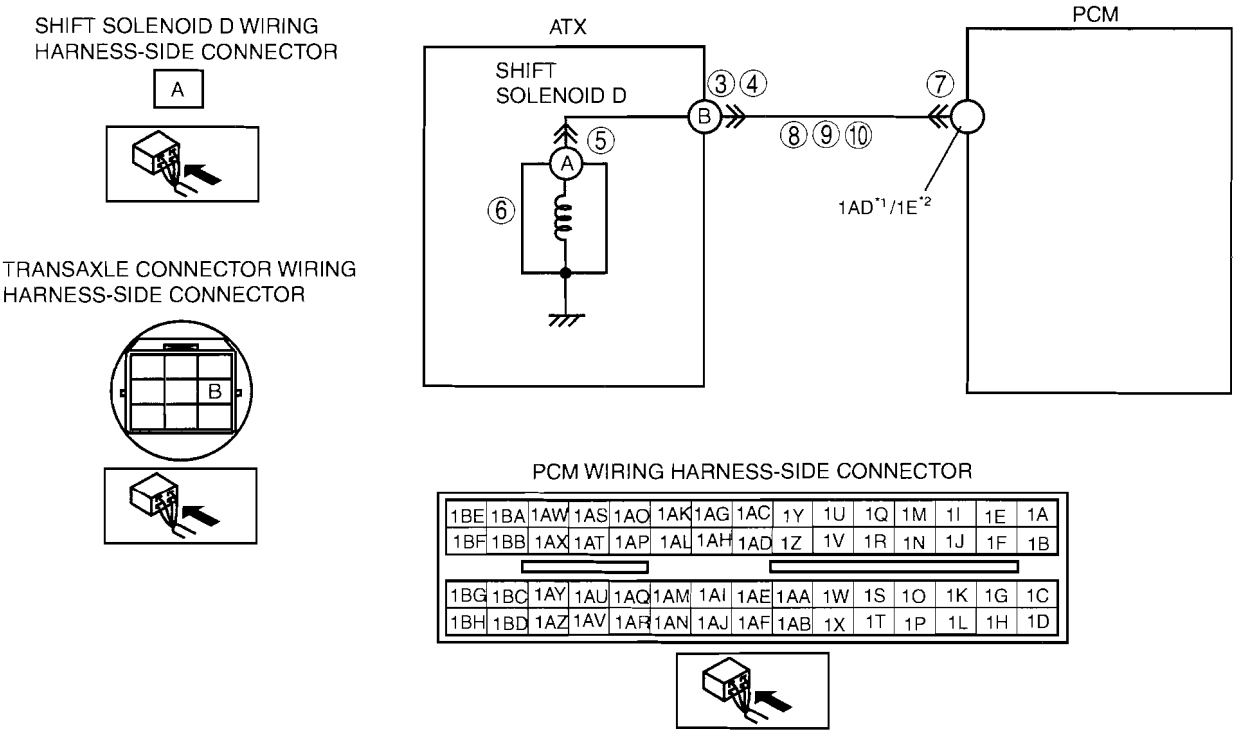
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 3GR • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0768[FN4A-EL]

id0502a1807000

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions while driving in 4GR at D range, the PCM determines that shift solenoid D circuit has a malfunction. — Shift solenoid D voltage stuck at **B+** after engine start — Shift solenoid D voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid D malfunction • Short to ground in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Short to power supply in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Open circuit in wiring harness between shift solenoid D terminal A and ATX terminal B • Open circuit in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Damaged connector between shift solenoid D and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal B (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid D connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid D terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid D installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1AD*1/1E*2 (wiring harness-side) and ATX terminal B (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal B (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1AD*1/1E*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	No concern is detected. Go to the next step.

STEP	INSPECTION		ACTION
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0771[FN4A-EL]

id0502a1809200

DTC P0771	Shift solenoid E stuck off
DETECTION CONDITION	• When any of P0732, and P0734 are not output, and all conditions below are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D range • Engine running • Turbine speed **within 225—4,987 rpm** • Vehicle speed **within 60—100 km/h {37—62 mph}** • Torque converter clutch (TCC) operating • Shift solenoid A duty value exceeds **99%** • Difference between engine speed and turbine speed **more than 100 rpm** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the M range — Vehicle speed: **within 60—100 km/h {37—62 mph}** (4GR only). • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0772[FN4A-EL]

id0502a1809300

DTC P0772	Shift solenoid E stuck on
DETECTION CONDITION	• When any of DTC P0731, P0733, and P0734 are not output, and all of the following conditions are satisfied under each of the following accelerator conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **less than 70 km/h {43 mph}** — Torque converter clutch (TCC) no operating — Difference between engine speed and turbine speed **50 rpm or less** — Accelerator conditions • Accelerator opening angle (APP PID) is **more than 6.25%** and **5 s or more** have passed • Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed • Accelerator opening angle is at closed accelerator position and **5 s or more** have passed **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

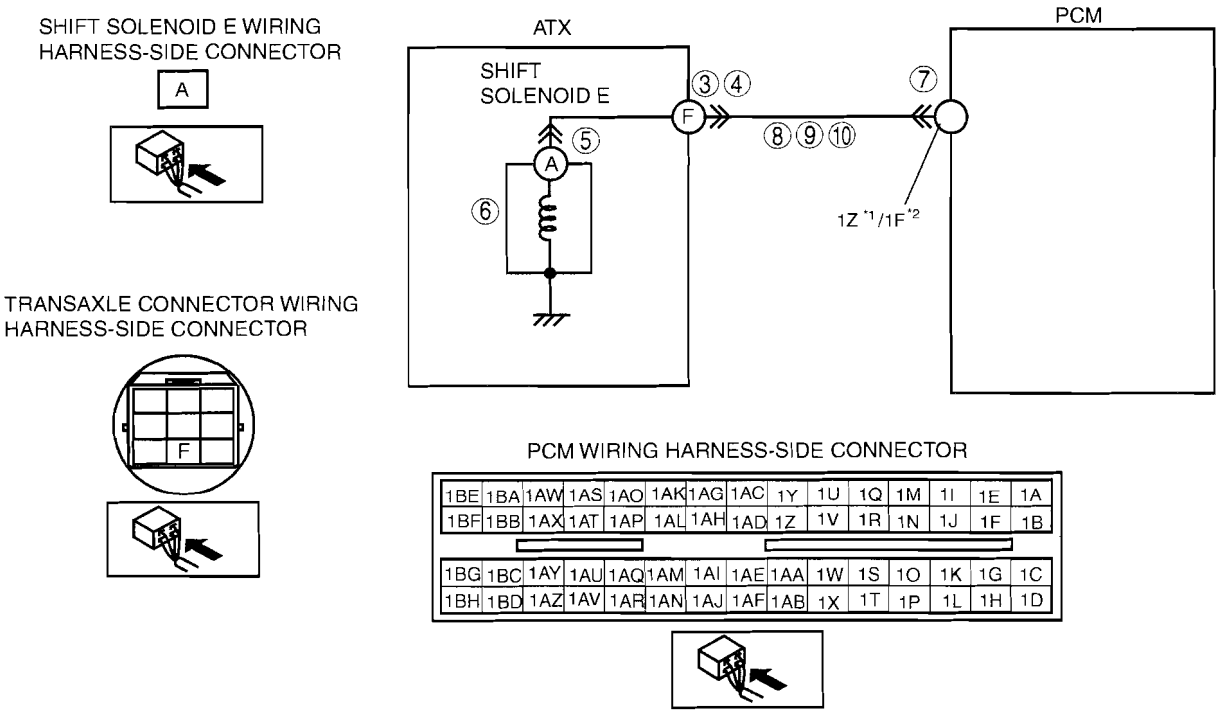
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0773[FN4A-EL]

id0502a1809400

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions while driving in 4GR at D range with TCC operating, PCM determines that shift solenoid E circuit has a malfunction. — Shift solenoid E voltage stuck at **B+** after engine start — Shift solenoid E voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid E malfunction • Short to ground in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Short to power supply in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Open circuit in wiring harness between shift solenoid E terminal A and ATX terminal F • Open circuit in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Damaged connector between shift solenoid E and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal F (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid E connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid E terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid E installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1Z*1/1F*2 (wiring harness-side) and ATX terminal F (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal F (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1Z*1/1F*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0883[FN4A-EL]

id0502a1802900

DTC P0883	Battery voltage high
DETECTION CONDITION	• Voltage of **16 V or more** detected at PCM terminal 1BE. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY DTC** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTC in the PCM memory. • Are DTC P2504 output?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0883 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0894[FN4A-EL]

id0502a1809600

DTC P0894	Forward clutch power transmission malfunction
DETECTION CONDITION	• With the engine running and the selector lever in the D or M range, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Vehicle speed **0 km/h {0 mph}** (brake on) — Even when **3 s or more** has passed since the engine has started, the turbine speed will not decrease to **less than 187.5 rpm**. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and PCM terminal 1A*1/1B*2 • Shift solenoid A stuck on • VSS malfunction • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTCs in the PCM memory. • Are DTCs P0500, P0752, and P0753 output?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	Replace the forward clutch, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0894 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up the engine. • With the selector lever in the D range and the vehicle stopped (brake on), wait **3 s or more**. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P1783[FN4A-EL]

id0502a1807700

DTC P1783	ATF high oil temperature malfunction
DETECTION CONDITION	• When all conditions below are satisfied. — P0712, P0713 not output — ATF temperature **149.5 °C {301°F} or more** — ATF oil temperature signal of **0.06 V or more** is input to PCM terminal 2AC*1/1U*2. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the PCM detects above malfunction conditions during the first drive cycle. • The PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• High engine load drive (Driving a steep gradient at a low speed.) • Insufficient or excess level of ATF • Deteriorated ATF • TFT sensor circuit malfunction • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

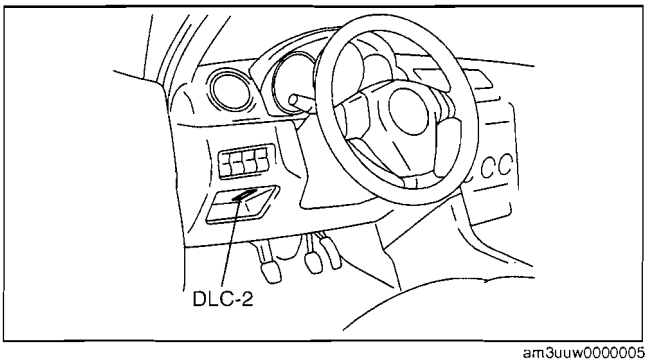
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY VEHICLE DRIVING CONDITIONS** • Verify each PID monitor of the HTM_CNT and HTM_DIS. • Verify vehicle driving conditions when a DTC P1783 is output. • Has the vehicle been driven at a high engine load?	Yes	• Go to Step 6. • Inform the customer that the ATX temperature is high due to high engine load driving.
		No	Go to the next step.
4	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 6. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
5	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to the next step. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
6	**VERIFY TROUBLESHOOTING OF DTC P1783 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

PID/DATA MONITOR INSPECTION[FN4A-EL]

id0502a1805600

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "DataLogger".
3. Select the PID from the PID table
4. Verify the PID data according to the directions on the M-MDS screen.



am3uuw0000005

Note
- Perform part inspection for the output device after PCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using methods such as the simulation function.

PID/DATA MONITOR AND RECORD function table

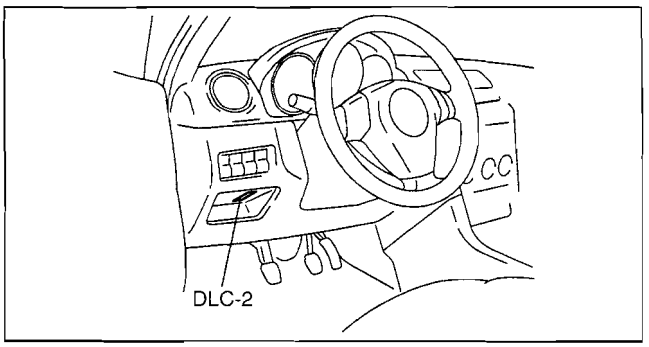
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
DWN SW (Down switch)	On/Off	• M range, downshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AF*1/1P*2
GEAR	1/2/3/4	1GR: 1 2GR: 2 3GR: 3 4GR: 4	Inspect the following PIDs: SSA/SS1, SSB/SS2, SSC/SS3, SSD/SS4, SSE_SS5	N/A
HTM_CNT	N/A	Indicates number of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) operations • 0—65,535	N/A	N/A
HTM_DIS	km	Indicates travel distance after operation of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) • 0—65,535 km	N/A	N/A
LINEDES	Pa	Indicates target line pressure	Inspect the following PIDs: APP, OSS, TFT, TFTV, TR, TSS, VPWR, VSS	N/A
LPS (Pressure control solenoid)	A	Change current value according to accelerator opening angle	Inspect the pressure control solenoid. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1M*1, 1N*1/ 1G*2, 1H*2
MNL SW (M range switch)	On/Off	M range: On Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AN*1/1O*2

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
OSS (Output shaft speed)	RPM	Indicates output shaft speed	Inspect the VSS. (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL].)	1AW*1/1J*2
SSA/SS1 (Shift solenoid A)	%	4GR: **99%** Others: **0%**	Inspect the shift solenoid A. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1A*1/1B*2
SSB/SS2 (Shift solenoid B)	%	1GR at D range: **99%** Others: **0%**	Inspect the shift solenoid B. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1E*1/1C*2
SSC/SS3 (Shift solenoid C)	%	1GR/2GR: **99%** Others: **0%**	Inspect the shift solenoid C. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1F*1/1D*2
SSD/SS4 (Shift solenoid D)	On/Off	• P/N position, 4GR at D range, 1GR at M range: On • Others: Off	Inspect the shift solenoid D. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1AD*1/1E*2
SSE_SS5 (Shift solenoid E)	On/Off	• TCC operating: On • TCC non operating: Off	Inspect the shift solenoid E. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1Z*1/1F*2
TFT (Transaxle fluid temperature)	°C	Indicates transaxle fluid temperature	Inspect the TFT sensor. (See 05-17A-18 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL].)	2AC*1/1U*2
TFTV (Transaxle fluid signal voltage)	V	ATF **20 °C {68 °F}: Approx. 3.3 V** ATF **40 °C {104 °F}: Approx. 2.4 V** ATF **60 °C {140 °F}: Approx. 1.5 V**	Inspect the TFT sensor. (See 05-17A-18 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL].)	2AC*1/1U*2
THOP (Throttle position sensor)	%	• CTP: **12%** • WOT: **75%**	Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].)	N/A
TR (Transaxle range)	P/R/N/D	P position: P R position: R N position: N D range: D	Inspect the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	1AH*1/1S*2
TR_SENS (TR switch)	V	P position: **4.34—4.79 V** R position: **3.83—4.18 V** N position: **3.05—3.50 V** D range: **2.23—2.66 V**	Inspect the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	1AH*1/1S*2
TSS (Input/turbine speed)	RPM	Ignition switch ON: **0 RPM** Idle: **700—800 RPM** (P, N position) Indicates Input/turbine speed	Inspect the input/turbine speed sensor. (See 05-17A-20 INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL].)	1AG*1, 1AO*1/ 1M*2, 1Q*2
UP SW (Up switch)	On/Off	• M range, upshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AJ*1/1K*2

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Simulation Function Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "DataLogger".
     - — Select "Modules".
     - — Select "PCM".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "PCM".
     - — Select "DataLogger".
3. Select the simulation items from the PID table.
4. Perform the simulation function, inspect the operations for each parts.
   - If there is no operation sound from the solenoid after the simulation function inspection is performed, it is possible that there is an open or short circuit in the wiring harness, or solenoid, or sticking and operation malfunction.



am3uuw0000005

Simulation item table

X: Available

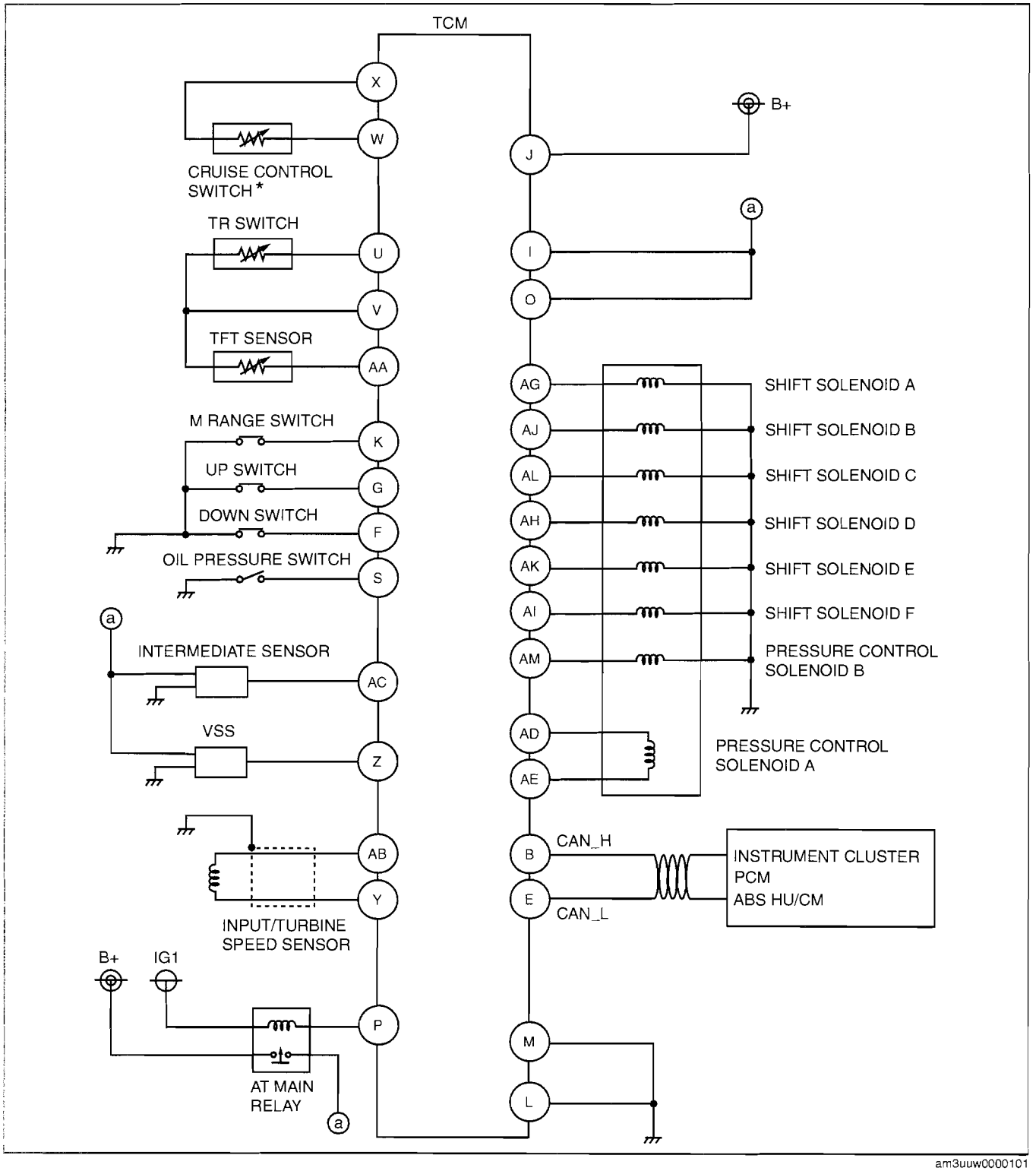
Simulation item	Applicable component	Unit/Condition	Operation		PCM terminal
			IG ON	Idle	
LPS	Pressure control solenoid	%	N/A	X	1M*1, 1N*1/1G*2, 1H*2
SSA/SS1	Shift solenoid A	%	N/A	X	1A*1/1B*2
SSB/SS2	Shift solenoid B	%	N/A	X	1E*1/1C*2
SSC/SS3	Shift solenoid C	%	N/A	X	1F*1/1D*2
SSD/SS4	Shift solenoid D	On/Off	N/A	X	1AD*1/1E*2
SSE_SS5	Shift solenoid E	On/Off	N/A	X	1Z*1/1F*2

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

05-02B ON-BOARD DIAGNOSTIC [FS5A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FS5A-EL]

id050221800100



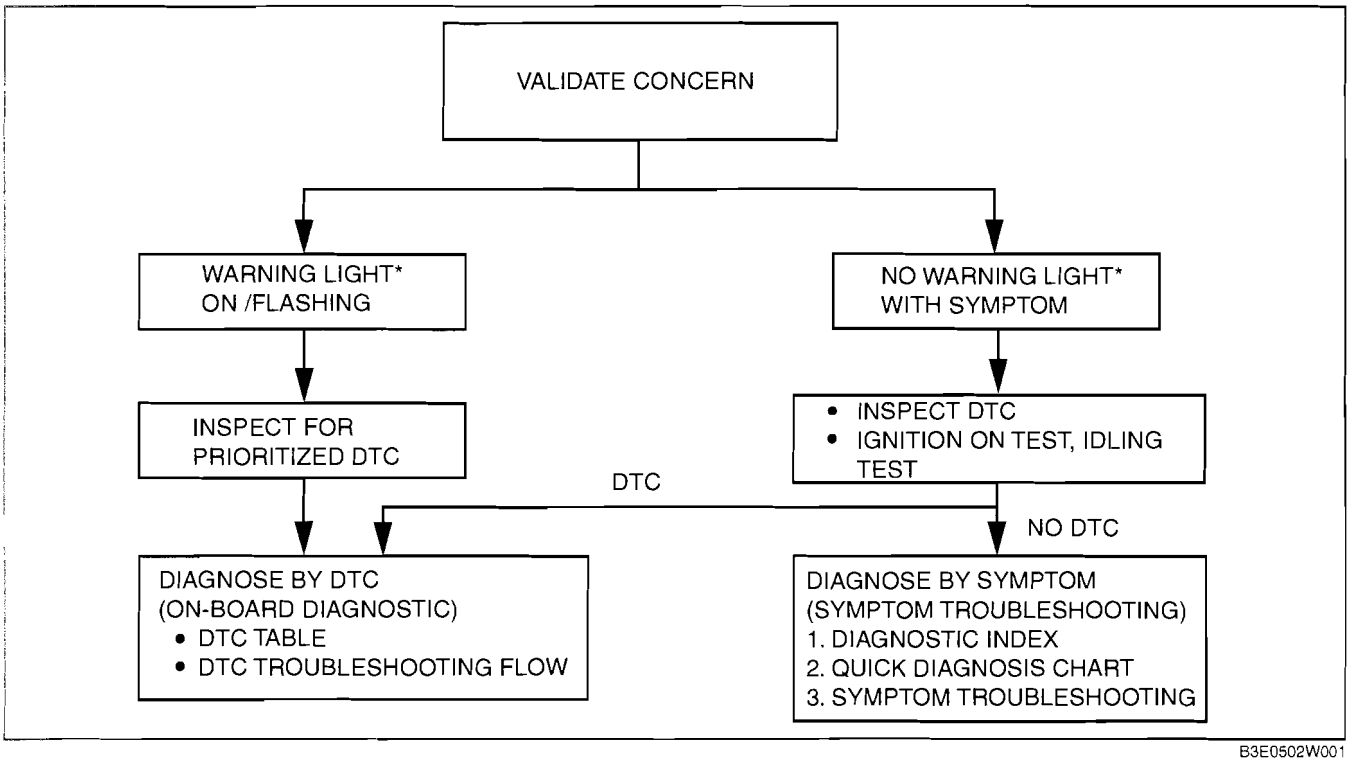
am3uuw0000101

* : Except for California emission regulation applicable model

FOREWORD[FS5A-EL]

id050221800200

- When the customer reports a vehicle malfunction, inspect the malfunction indicator lamp (MIL), AT warning light indication, and TCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  — If a DTC exists, diagnose the applicable DTC. (See 05-02B-9 DTC TABLE[FS5A-EL].)
  — If no DTC exists, the MIL does not illuminate, and AT warning light does not illuminate. Diagnose the applicable symptom troubleshooting. (See 05-03B-4 SYMPTOM TROUBLESHOOTING ITEM TABLE[FS5A-EL].)



B3E0502W001

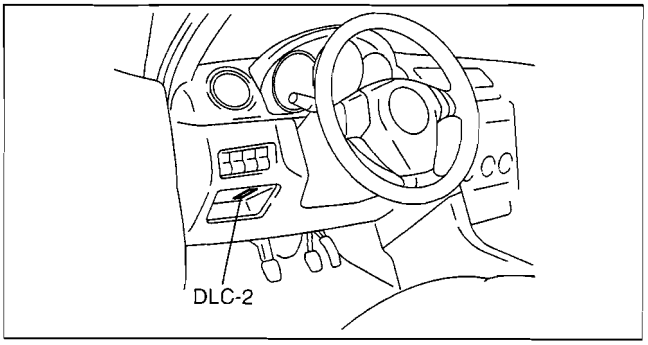
*: Malfunction indicator lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION[FS5A-EL]

id050221800300

DTC Reading Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "TCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TCM".
     3. Select "Self Test".
4. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the TCM. (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].)



am3uuw0000006

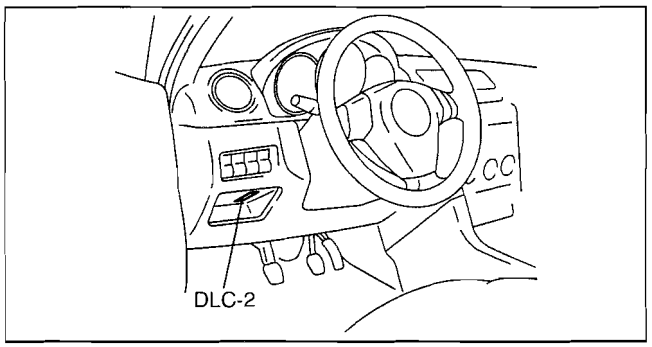
AFTER REPAIR PROCEDURE[FS5A-EL]

id050221800400

Caution

- **After repairing a malfunction, perform the following procedure to verify that the malfunction has been corrected.**
- **When performing this procedure, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "SelfTest".
     3. Select "Modules".
     4. Select "TCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TCM".
     3. Select "SelfTest".
3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Perform the following DTC inspections to ensure that the DTCs have been resolved:



am3uuw0000005

DTC No.	inspection
P0706, P0707, P0708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **20 km/h {12.4 mph} or more** for **100 s or more**. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range at **20 km/h {12.4 mph} or more** for **100 s or more**. vii. Go to Step 6.
P0711	i. Start the engine then wait **180 s or more**. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **within 25—59 km/h {16—36 mph}** for **90 s or more**. iv. Drive the vehicle in D range, at **60 km/h {37 mph}** for **60 s or more**. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Drive the vehicle in D range, at **within 25—59 km/h {16—36 mph}** for **90 s or more**. viii. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. ix. Go to Step 6.
P0712, P0713	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **20 km/h {12 mph} or more** for **150 s or more**. iv. Go to Step 6.
P0715	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **41 km/h {25 mph} or more** for **0.7 s or more**. iv. Go to Step 6.
P0720	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.

DTC No.	inspection
P0731	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 1GR • Throttle opening angle (THOP PID): **2.77% or more** iv. Go to Step 6.
P0732	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 3 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 2GR iv. Go to Step 6.
P0733	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 3GR iv. Go to Step 6.
P0734	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 4GR iv. Go to Step 6.
P0735	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D or M range, from 1GR to 5GR iv. Go to Step 6.
P0741	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Go to Step 6.
P0742	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. iv. Go to Step 6.
P0744, P0753, P0758, P0763, P0768, P0773, P0778, P0841, P0883, P1783, P2709	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR and TCC is operated. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR and TCC is operated. vii. Go to Step 6.
P0745	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range. iv. Go to Step 6.

DTC No.	inspection
P0751	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.
P0752	i. Start the engine. ii. Warm up the engine and ATX. iii. Selector lever position: D range iv. Depress the brake pedal. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Selector lever position: D range viii. Depress the brake pedal. ix. Go to Step 6.
P0756	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0757, P0766	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR vii. Go to Step 6.

DTC No.	inspection
P0761	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR vii. Go to Step 6.
P0762	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0767	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0771	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.

DTC No.	inspection
P0772	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. vii. Go to Step 6.
P0777	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR vii. Go to Step 6.
P0791	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **40 km/h {25 mph} or more** for **4.5 s or more**. iv. Go to Step 6.
P0894	i. Start the engine. ii. Warm up the engine and ATX. iii. Depress the brake pedal. iv. Throttle opening angle at closed throttle position. v. Shift the selector lever from the N position to the D range and hold for **3 s or more**. vi. Go to Step 7.
P2707	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 3GR or 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 3GR or 4GR vii. Go to Step 6.

DTC No.	inspection
P2708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR vii. Go to Step 6.

6. Gradually slow down and stop the vehicle.
7. Make sure that the repaired DTC does not recur.

DTC TABLE[FS5A-EL]

id050221800500

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0706	Transaxle range (TR) switch circuit range/ performance	ON	YES	2	CCM	X	(See 05-02B-12 DTC P0706[FS5A-EL].)
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	X	(See 05-02B-13 DTC P0707[FS5A-EL].)
P0708	Transaxle range (TR) switch circuit high input	ON	YES	2	CCM	X	(See 05-02B-15 DTC P0708[FS5A-EL].)
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	ON	NO	2	CCM	X	(See 05-02B-17 DTC P0711[FS5A-EL].)
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	X	(See 05-02B-18 DTC P0712[FS5A-EL].)
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	X	(See 05-02B-21 DTC P0713[FS5A-EL].)
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-23 DTC P0715[FS5A-EL].)
P0720	Vehicle speed sensor (VSS) circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-26 DTC P0720[FS5A-EL].)
P0731	Gear 1 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-28 DTC P0731[FS5A-EL].)
P0732	Gear 2 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-30 DTC P0732[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0733	Gear 3 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-33 DTC P0733[FS5A-EL].)
P0734	Gear 4 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-35 DTC P0734[FS5A-EL].)
P0735	Gear 5 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-38 DTC P0735[FS5A-EL].)
P0741	Torque converter clutch (TCC) (stuck off)	OFF	YES	1	CCM	X	(See 05-02B-40 DTC P0741[FS5A-EL].)
P0742	Torque converter clutch (TCC) (stuck on)	OFF	YES	1	CCM	X	(See 05-02B-41 DTC P0742[FS5A-EL].)
P0744	Slip control malfunction	OFF	YES	2	CCM	X	(See 05-02B-43 DTC P0744[FS5A-EL].)
P0745	Pressure control solenoid A malfunction	OFF	YES	1	CCM	X	(See 05-02B-45 DTC P0745[FS5A-EL].)
P0751	Shift solenoid A stuck off	ON	YES	2	CCM	X	(See 05-02B-47 DTC P0751[FS5A-EL].)
P0752	Shift solenoid A stuck on	ON	YES	2	CCM	X	(See 05-02B-49 DTC P0752[FS5A-EL].)
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-51 DTC P0753[FS5A-EL].)
P0756	Shift solenoid B stuck off	ON	YES	2	CCM	X	(See 05-02B-53 DTC P0756[FS5A-EL].)
P0757	Shift solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02B-55 DTC P0757[FS5A-EL].)
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-57 DTC P0758[FS5A-EL].)
P0761	Shift solenoid C stuck off	ON	YES	2	CCM	X	(See 05-02B-59 DTC P0761[FS5A-EL].)
P0762	Shift solenoid C stuck on	ON	YES	2	CCM	X	(See 05-02B-61 DTC P0762[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-63 DTC P0763[FS5A-EL].)
P0766	Shift solenoid D stuck off	ON	YES	2	CCM	X	(See 05-02B-65 DTC P0766[FS5A-EL].)
P0767	Shift solenoid D stuck on	ON	YES	2	CCM	X	(See 05-02B-67 DTC P0767[FS5A-EL].)
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-69 DTC P0768[FS5A-EL].)
P0771	Shift solenoid E stuck off	ON	YES	2	CCM	X	(See 05-02B-71 DTC P0771[FS5A-EL].)
P0772	Shift solenoid E stuck on	ON	YES	2	CCM	X	(See 05-02B-73 DTC P0772[FS5A-EL].)
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-75 DTC P0773[FS5A-EL].)
P0777	Pressure control solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02B-77 DTC P0777[FS5A-EL].)
P0778	Pressure control solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-79 DTC P0778[FS5A-EL].)
P0791	Intermediate sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-82 DTC P0791[FS5A-EL].)
P0841	Oil pressure switch circuit malfunction	OFF	NO	2	CCM	X	(See 05-02B-85 DTC P0841[FS5A-EL].)
P0882	Battery back-up power supply circuit malfunction	ON	NO	1	CCM	X	(See 05-02B-87 DTC P0882[FS5A-EL].)
P0883	Battery voltage high	ON	YES	1	CCM	X	(See 05-02B-89 DTC P0883[FS5A-EL].)
P0894	Forward clutch torque transmission	OFF	YES	1	CCM	X	(See 05-02B-90 DTC P0894[FS5A-EL].)
P1783	ATF high oil temperature malfunction	OFF	YES	1	CCM	X	(See 05-02B-91 DTC P1783[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P2707	Shift solenoid F stuck off	ON	YES	2	CCM	X	(See 05-02B-92 DTC P2707[FS5A-EL].)
P2708	Shift solenoid F stuck on	ON	YES	2	CCM	X	(See 05-02B-94 DTC P2708[FS5A-EL].)
P2709	Shift solenoid F malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-96 DTC P2709[FS5A-EL].)
U0073	CAN system communication error	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0100	Communication error to PCM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					

DTC P0706[FS5A-EL]

id050221800900

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Engine speed **530 rpm or more** — Vehicle speed **20 km/h {12 mph} or more** — Voltage at TCM terminal U **0.5 V or more** — P, R, N, or D range/position not detected **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Adjust the TR switch, then go to the next step. (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)
		No	Replace the TR switch, then go to the next step. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)

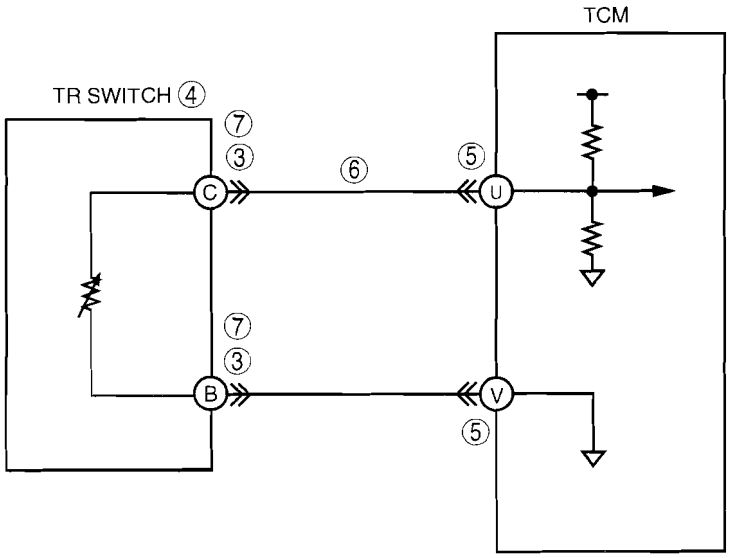
STEP	INSPECTION		ACTION
4	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in each range (D and R) for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0707[FS5A-EL]

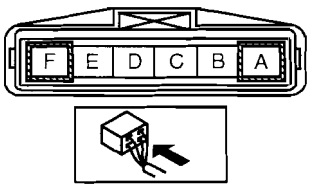
id050221801000

DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at TCM terminal U **0.5 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Short to ground in wiring harness between TR switch terminal C and TCM terminal U • TR switch signal and TR switch ground circuits shorted each other • TCM malfunction

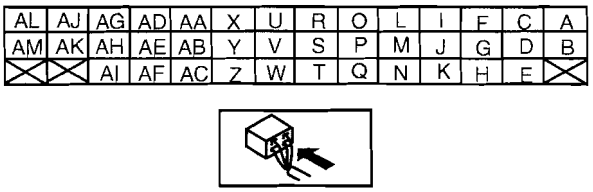
DTC P0707	Transaxle range (TR) switch circuit low input



TR SWITCH WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection at TR switch terminals B and C (part-side) (such as damaged/pulled-out pins, corrosion) • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 8. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
4	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 8. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection at terminals U and V (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.

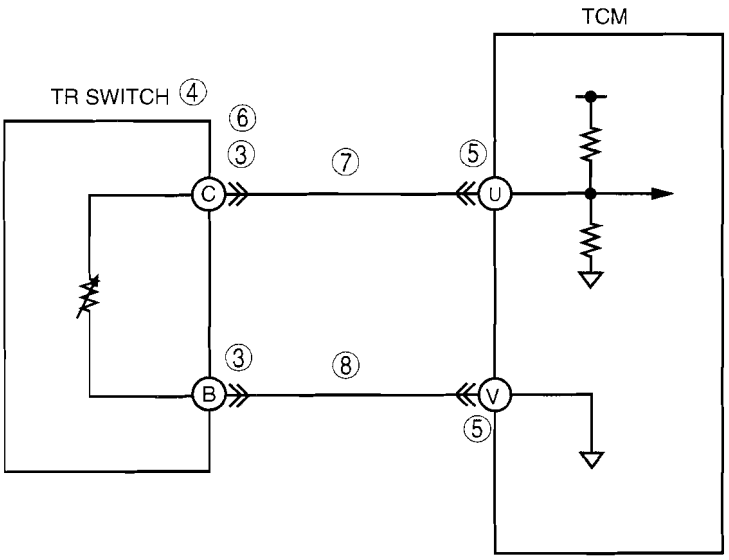
STEP	INSPECTION		ACTION
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between TR switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT CIRCUIT** • Inspect for continuity between TR switch terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short circuit, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0708[FS5A-EL]

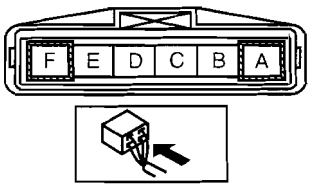
id050221801100

DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at TCM terminal U **4.79 V or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Open circuit in wiring harness between TR switch terminal C and TCM terminal U • Short to power supply in wiring harness between TR switch terminal C and TCM terminal U • Open circuit in wiring harness between TR switch terminal B and TCM terminal V • Poor connection of TR switch or TCM connectors • TCM malfunction

DTC P0708	Transaxle range (TR) switch circuit high input

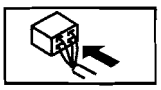


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 9. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
4	**INSPECT TR SWITCH** • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 9. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection at terminals U and V (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to step 9.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between TR switch terminal C and (wiring harness-side) body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal C (wiring harness-side) and TCM terminal U. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to step 9.
8	**INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal B (wiring harness-side) and TCM terminal V. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID) **530 rpm or more** — Vehicle speed (VSS PID) **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0711[FS5A-EL]

id050221801200

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	• When all conditions below are satisfied. — When **180 s or more** have passed after the engine is started, vehicle is driven for **90 s or more** at vehicle speed **between 25—59 km/h {15—36 mph}**, then **60 km/h {37 mph} or more** for **60 s or more**. — P0712, P0713 not output — Variation in ATF voltage **0.03 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light does not illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

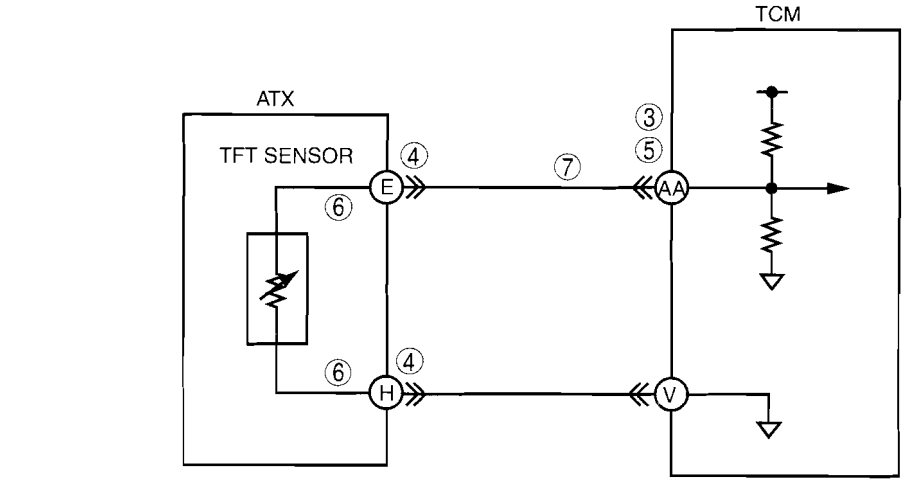
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA. • Record terminal AA voltage. • Start the engine. • Drive the vehicle at **60 km/h {37 mph} or more** for **330 s or more**. • Record terminal AA voltage again. • Is the variation in voltage **0.03 V or more**?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect terminals for corrosion. • Are terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Decrease ATF temperature to **20 °C {68 °F} or less**. • Start the engine and wait for **180 s or more**. • Drive the vehicle at a vehicle speed **between 25—59 km/h {15—36 mph}** for **90 s or more**. • Drive the vehicle at a vehicle speed **60 km/h {37 mph} or more** for **60 s or more**. • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0712[FS5A-EL]

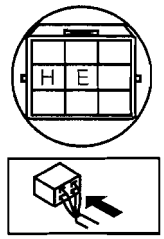
id050221801300

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• If the TCM detects either of the following conditions for **150 s or more**, the TCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **0.12 V or less** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Short to ground in wiring harness between TFT sensor and transaxle connector (primary) terminal E • Short to ground in wiring harness between TFT sensor and transaxle connector (primary) terminal H • Short to ground in wiring harness between transaxle connector (primary) terminal E and TCM terminal AA • Damaged connectors between TFT sensor and TCM • TCM malfunction

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)

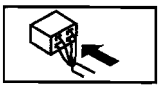


TRANSAXLE CONNECTOR (PRIMARY)
WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



05-02B

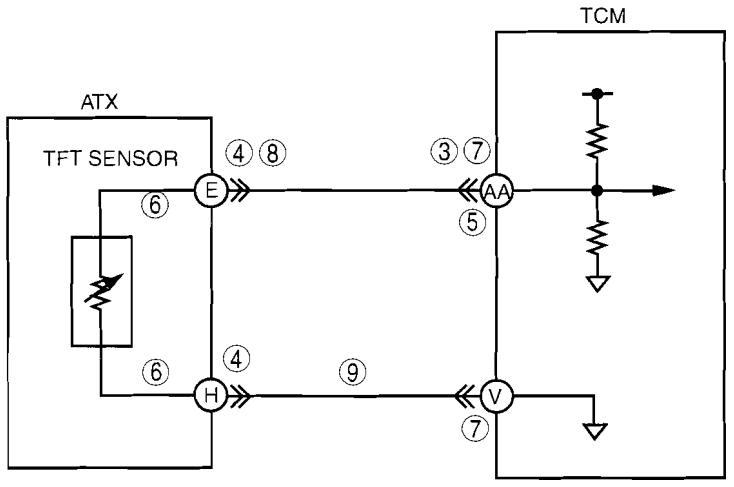
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at TCM terminal AA. • Is the voltage **0.06 V or more**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Are the terminals bent?	Yes	Repair or replace the terminals, then go to Step 8. • If the terminals cannot be repaired, replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Verify that the voltage changes to **4.67 V or more** at TCM terminal AA when transaxle connector (primary) is disconnected. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between transaxle connector (primary) terminals (transaxle case side) and body ground. — E and body ground — H and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Replace the TFT sensor, then go to Step 8. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
7	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

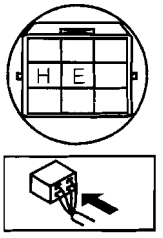
DTC P0713[FS5A-EL]

id050221801400

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• If the TCM detects the following condition for **150 s or more**, the TCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **4.67 V or more** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit in wiring harness between TFT sensor and transaxle connector (primary) terminal E • Open circuit in wiring harness between TFT sensor and transaxle connector (primary) terminal H • Open circuit in wiring harness between transaxle connector (primary) terminal E and TCM terminal AA • Open circuit in wiring harness between transaxle connector (primary) terminal H and TCM terminal V • Damaged connectors between TFT sensor and TCM • TCM malfunction

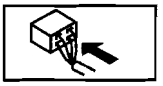


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

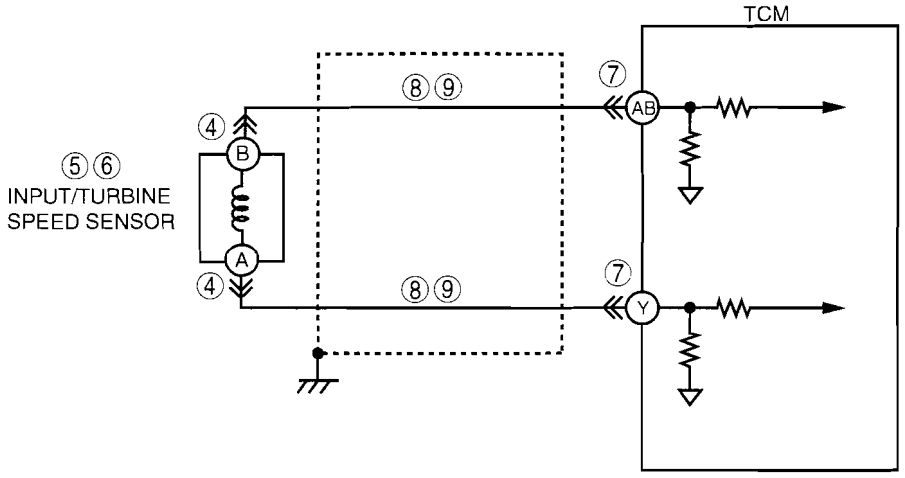
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA. • Is the voltage **4.67 V or less**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Inspect transaxle connector (primary) connection. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA when connect between transaxle connector (primary) terminals E and H (wiring harness-side) using jumper wire. • Verify that voltage changes to **0.06 V or less**. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between transaxle connector (primary) terminals (transaxle case side) E and H. • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 10. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
		No	Repair or replace the wiring harness, then go to Step 10.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT WIRING HARNESS FOR OPEN CIRCUIT** • Disconnect the transaxle connector (primary). • Connect the TCM connector. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal E (vehicle wiring harness-side). • Is the voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal H (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

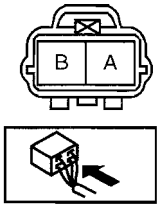
DTC P0715[FS5A-EL]

id050221806100

DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• When all conditions below are satisfied and **0.7 s or more** have passed. — D range of TR switch input — Driving vehicle at vehicle speed of **41 km/h {25 mph} or more** — Input/turbine speed sensor signal not input **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground in wiring harness between input/turbine speed sensor terminal A and TCM terminal Y • Short to ground in wiring harness between input/turbine speed sensor terminal B and TCM terminal AB • Open circuit in wiring harness between input/turbine speed sensor terminal A and TCM terminal Y • Open circuit in wiring harness between input/turbine speed sensor terminal B and TCM terminal AB • Damaged connectors between input/turbine speed sensor and TCM • TCM malfunction

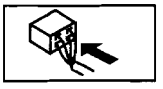


INPUT/TURBINE SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

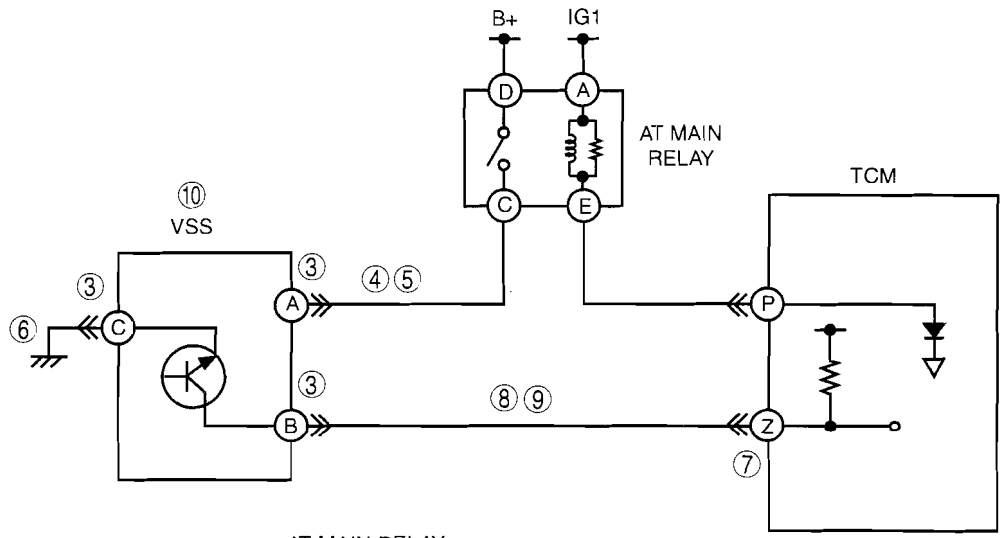
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the LOCK position. • Start the engine. • Measure the frequency of input/turbine speed sensor using a oscilloscope. — IG ON: **0 Hz** — Idle: **Within 320—374 Hz** (P, N position) • Are frequencies of input/turbine speed sensor within specifications?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the input/turbine speed sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between the input/ turbine speed sensor terminals (part-side). • Is the resistance **within 250—600 ohms** between input/turbine speed sensor terminals (part-side)? (See 05-17B-24 INPUT/TURBINE SPEED SENSOR INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the input/turbine speed sensor, then go to Step 10. (See 05-17B-25 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
6	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See 05-17B-25 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL].)	Yes	Clean the input/turbine speed sensor, then go to Step 10.
		No	Go to the next step.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect the following input/turbine speed sensor terminals (wiring harness-side) and TCM terminals (wiring harness-side): — A and Y — B and AB • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal (wiring harness-side) and body ground. — A and body ground — B and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle a vehicle speed **41 km/h {25 mph} or more** for **0.7 s or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

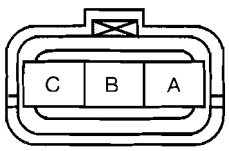
DTC P0720[FS5A-EL]

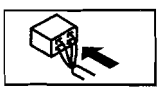
id050221809800

DTC P0720	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Vehicle speed signal is not input after the following conditions are met and **4.5 s or more** have passed. — D range switch ON — Engine coolant temperature **60 °C {140 °F} or more** — Turbine speed **1,500 rpm or more** — Secondary gear revolution speed **50 rpm or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• VSS malfunction • Open circuit in wiring harness between VSS terminal B and TCM terminal Z • Short to ground in wiring harness between VSS terminal B and TCM terminal Z • Open circuit in wiring harness between VSS terminal A and main relay terminal C • Short to ground in wiring harness between VSS terminal A and AT main relay terminal C • Open circuit in wiring harness between VSS terminal C and body ground • Damaged connectors between VSS and TCM • TCM malfunction

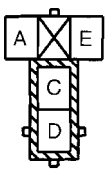


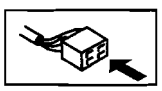
VSS WIRING HARNESS-SIDE CONNECTOR





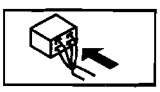
AT MAIN RELAY WIRING HARNESS-SIDE CONNECTOR





TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the VSS connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that the VSS connector is disconnected. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between VSS terminal A (wiring harness-side) and ground. • Is the voltage **B+**?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT VSS POWER CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between VSS terminal A (wiring harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
6	**INSPECT VSS GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that the VSS connector is disconnected. • Inspect for continuity between VSS (wiring harness-side) terminal C and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
8	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the TCM connector and VSS connector. • Inspect for continuity between VSS terminal B and TCM terminal Z. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verity that the VSS connector and TCM connector are disconnected. • Inspect for continuity between TCM terminal Z and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Replace the VSS, then go to the next step. (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)
10	**INSPECT VEHICLE SPEED SENSOR** • Inspect the VSS. (See 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].) • Is VSS normal?	Yes	Go to the next step.
		No	Repair or replace the VSS, then go to Step 11.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up engine. • Drive the vehicle under the following conditions for **4.5 s or more** while monitoring PIDs. — Engine coolant temp (ECT PID): **60 °C {140 °F} or more** — Drive in D or M range — Frequency of input/turbine speed sensor: **800 Hz or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0731[FS5A-EL]

id050221801900

DTC P0731	Gear 1 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors the revolution ratio of the forward clutch drum revolution to secondary gear revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or less**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Throttle opening angle **2.77% or more** — Differential gear case (output) revolution speed **35 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Pressure control solenoid A stuck • Line pressure low • One-way clutch slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID A** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A when applying B+ to transaxle terminal A. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid that you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **20 km/h {12 mph}** — Drive in the D range, 1GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0731** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 1GR — Throttle opening angle (THOP PID): **2.77% or more** — Vehicle speed (VSS PID): **4 km/h {3 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0732[FS5A-EL]

id050221802000

DTC P0732	Gear 2 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If revolution ratio is **1.249 or less** or **2.157 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 2 GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECTION SHIFT SOLENOID A, B AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A, B, and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **40 km/h {24 mph}** — Drive in the D range, 2GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 3 times for **more than 1 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 2GR — Vehicle speed (VSS PID): **3.8 km/h {2.4 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0733[FS5A-EL]

id050221802100

DTC P0733	Gear 3 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.863 or less**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Torque converter clutch (TCC) not operating — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.175 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 1.345—1.644**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Torque converter clutch (TCC) not operating — Vehicle speed **26 km/h {16 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A or C stuck • Pressure control solenoid A stuck • Line pressure low • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass, TCC or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECTION SHIFT SOLENOID A AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **60 km/h {37 mph}** — Drive in the D range, 3GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0733** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 2 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 3GR — Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0734[FS5A-EL]

id050221802200

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.6 or less** or **1.249 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Vehicle speed **28 km/h {17 mph} or more** — Throttle opening angle at closed throttle position — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 0.91—1.09**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR in D or M range — Torque converter clutch (TCC) not operating — Vehicle speed **36 km/h {22 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID A AND D FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoids A and D when applying B+ to each transaxle terminal. **Note** • The click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
8	**VERIFY REPAIR OF DTC P0734** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 5 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **0%** — Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0735[FS5A-EL]

id050221802300

DTC P0735	Gear 5 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the secondary gear revolution to the differential gear case revolution when the following monitoring conditions are met. When any of the following conditions are met: — Revolution ratio of the secondary gear and the differential gear case is **1.11 or less** when driving in 3GR or 4GR. — Revolution ratio of the secondary gear and differential gear case is **1.11 or more** when driving in 5GR. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Throttle opening angle **2.77% or more** — Secondary gear revolution speed **50 rpm or more** — Turbine speed **within 225—4,987 rpm** — Vehicle speed **29 km/h {18 mph} or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0777, P0778, P0791, P2707, P2708, P2709 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid F stuck • Pressure control solenoid B stuck • Line pressure low • Direct clutch slipping • Reduction brake slipping • Control valve stuck (Bypass or 4-5 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 9.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 9. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID F AND PRESSURE CONTROL SOLENOID B FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid F and pressure control solenoid B when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 9. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 9. Any ranges: Replace the secondary control valve body, then go to Step 8. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 9. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INTERMEDIATE SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of intermediate sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the intermediate sensor at **approx. 4,800 Hz**?	Yes	Go to the next step.
		No	Replace the secondary control valve body, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
8	**INSPECT FREQUENCY OF INTERMEDIATE SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **90 km/h {56 mph}** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 4,100 Hz**?	Yes	Go to the next step.
		No	Replace the secondary control valve body, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
9	**VERIFY REPAIR OF DTC P0735** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 5 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **2.77% or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0741[FS5A-EL]

id050221807900

DTC P0741	Torque converter clutch (TCC) stuck off
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — Torque converter clutch (TCC) operating — Shift solenoid A duty value exceeds **99%** — Difference between engine speed and turbine speed **more than 100 rpm** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the automatic transaxle, then go to Step 6. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions for **5 s or more**. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC operation) — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0742[FS5A-EL]

id050221808000

DTC P0742	Torque converter clutch (TCC) stuck on
DETECTION CONDITION	• All of the following conditions are satisfied under each of the following throttle conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **70 km/h {43 mph} or less** — Torque converter clutch (TCC) not operating — Difference between engine speed and turbine speed **50 rpm or less** — DTC P0734 not output — Throttle conditions • Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. • Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. • Throttle opening angle is at closed throttle position and **5 s or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the automatic transaxle, then go to Step 6. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC not in operation) — Vehicle speed (VSS PID): **70 km/h {43 mph} or less**. • Throttle conditions — Throttle opening angle (THOP PID) **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle at closed throttle position and **5 s or more** have passed. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0744[FS5A-EL]

id050221809700

DTC P0744	Slip control malfunction
DETECTION CONDITION	• With the engine running, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle **18.75% or less** — Torque converter clutch (TCC) operating — Drive the vehicle at 3GR, 4GR, or 5GR, slip control operation — When any of the following conditions are met: • Revolution ratio of the forward clutch drum to secondary gear is **1.344 or less** or **1.645 or more** when driving in 2GR. • Revolution ratio of the forward clutch drum to secondary gear is **0.91 or less** or **1.09 or more** when driving in 3GR. • Revolution ratio of the forward clutch drum to secondary gear is **0.636 or less** or **0.817 or more** when driving in 4GR. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • DTCs are stored in the TCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and TCM terminal 1A • Shift solenoid A stuck on • Short to power supply in wiring harness between shift solenoid D terminal A and TCM terminal 1F • Shift solenoid D stuck on • Short to ground in wiring harness between shift solenoid E terminal A and TCM terminal 1H • Shift solenoid E stuck off • TCM malfunction

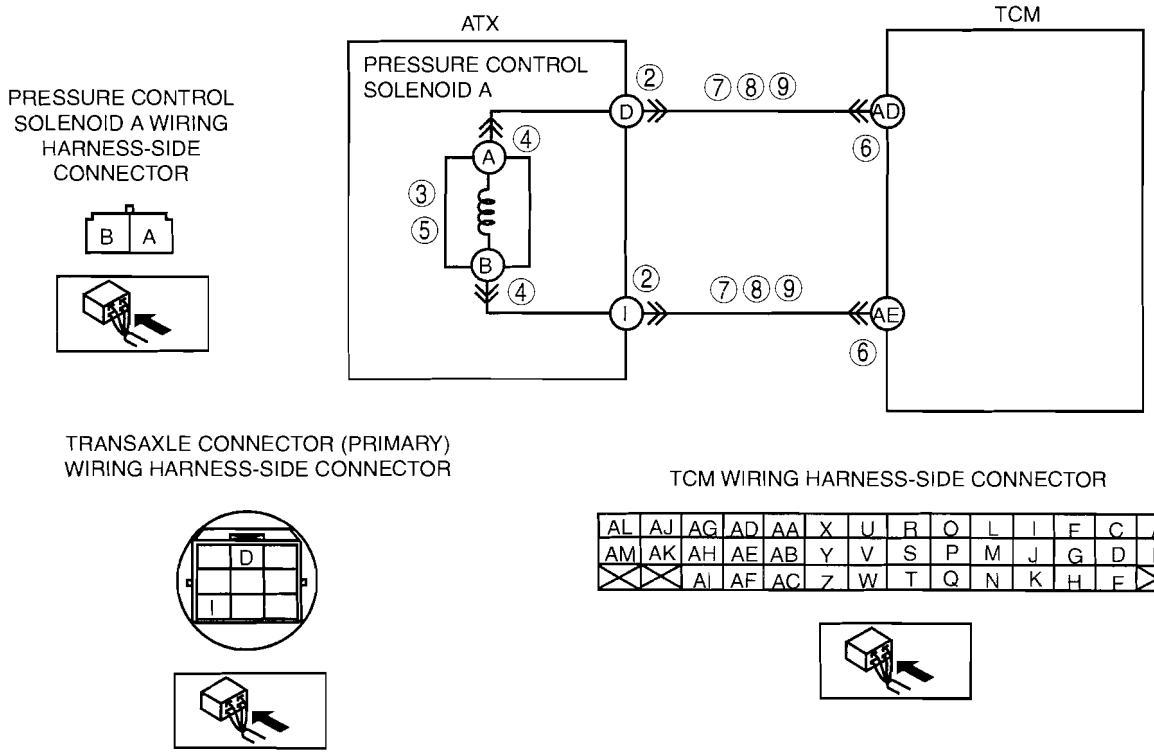
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTCs in the TCM memory. • Are DTCs P0752, P0753, P0767, P0768, P0771, and P0773 output?	Yes	Go to the applicable DTC inspection.
		No	Replace the forward clutch, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0744 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up the engine. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 5GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Throttle opening angle (THOP PID): **18.75% or less** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0745[FS5A-EL]

id050221806600

DTC P0745	Pressure control solenoid A malfunction
DETECTION CONDITION	• If the TCM detects either of the following conditions, the TCM determines that pressure control solenoid A circuit has a malfunction. — Pressure control solenoid A voltage stuck **0 V** after engine start — Pressure control solenoid A voltage stuck **B+** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Pressure control solenoid A malfunction • Open circuit in wiring harness between pressure control solenoid A terminal B and transaxle connector (primary) terminal I • Open circuit in wiring harness between transaxle connector (primary) terminal I and TCM terminal AE • Short to ground in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Short to power supply in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Open circuit in wiring harness between pressure control solenoid A terminal A and transaxle connector (primary) terminal D • Open circuit in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Damaged connector between pressure control solenoid A and TCM • TCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
3	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminals D and I (transaxle case side). • Is the resistance **within 2.4—7.3 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 6.
		No	Go to the next step.
4	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT RESISTANCE** • Inspect the resistance between the pressure control solenoid terminals A and B. • Is the resistance **within 2.4—7.3 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 10.
		No	Verify pressure control solenoid installation. • If solenoid installed correctly, replace the pressure control solenoid, then go to Step 10. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
7	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the TCM (wiring harness-side) and transaxle connector (primary) (wiring harness-side). — TCM terminal AD and transaxle connector (primary) terminal D — TCM terminal AE and transaxle connector (primary) terminal I • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, the go to Step 10.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal D (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Make sure to wait **more than 1 s** after turning the ignition switch to the ON position. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0751[FS5A-EL]

id050221808100

DTC P0751	Shift solenoid A stuck off
DETECTION CONDITION	• When P0731, P0732, and P0733 are not output, and all conditions below are satisfied. — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Vehicle speed **36 km/h {22 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Torque converter clutch (TCC) not operating — Revolution ratio of forward clutch drum revolution to secondary gear revolution **within 0.91—1.09** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **36 km/h {22 mph}** (4GR only) • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0752[FS5A-EL]

id050221808200

DTC P0752	Shift solenoid A stuck on
DETECTION CONDITION	• When P0734 is not output, and all conditions below are satisfied in 1GR and 2GR. — Engine running — ATF temperature **20 °C {68 °F} or more** — D range selected — Brake pedal depressed — Throttle opening angle at closed throttle position — Vehicle speed **0 km/h {0 mph}** — Input/turbine speed sensor signal **187.5 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

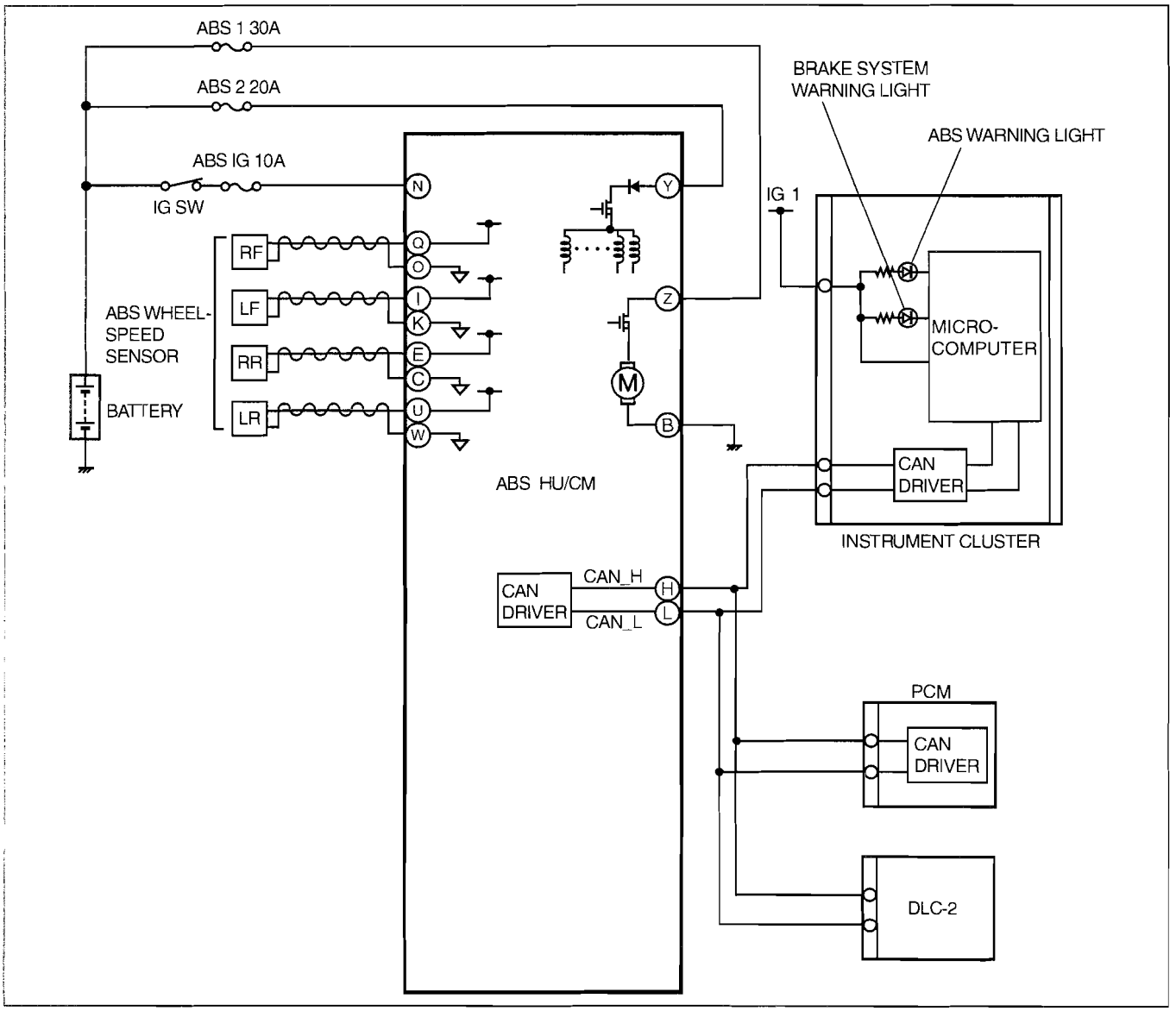
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

04-03A SYMPTOM TROUBLESHOOTING [ABS]

SYSTEM WIRING DIAGRAM[ABS]

id0403a5806400



am3zzw0000240

FOREWORD[ABS]

id0403a5804000

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic inspection. To inspect the DTC, follow the DTC Inspection steps. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)

PRECAUTION[ABS]

id0403a5804100

1. Any one or a combination of the ABS warning and BRAKE system warning lights illuminates even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD control
Either or both of the following lights illuminate: • ABS warning light • BRAKE system warning light(*1)	When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun.	After turning ignition switch off, vehicle is driven at speed **greater than 10 km/h {6.2 mph}** and normal operation is confirmed.	• ABS: Cuts control. • EBD: 1. Cuts control, in cases where the light may illuminate, only when ABS CM detects that a wheel speed sensor determines that more than two wheels are malfunctioning. 2. Operates control, if wheel speed sensor determines that more than three wheels are functioning correctly.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/ deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
Both of the following lights illuminate: • ABS warning light • BRAKE system warning light	Battery voltage at ABS HU/CM ignition terminal AK drops **below approx. 8 V.**(*2)	Battery voltage rises **above approx. 8 V.**	ABS: Cuts control. EBD: Cuts control.

*1 : In cases where the light may illuminate, only when ABS HU/CM detects that a wheel-speed sensor determines that more than two wheels are malfunctioning.
*2 : If battery voltage drops **below 8 V** while vehicle speed is **greater than 20 km/h {12.4 mph}**, ABS HU/CM records DTC B1318.

2. Precautions during servicing of ABS
The ABS is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.
(1) Malfunctions in electrical system
- The ABS hydraulic unit and control module (ABS HU/CM) has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light will illuminate when there is a problem in the electrical system. Also, past and present malfunctions are recorded in the ABS HU/CM. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC-2. The stored malfunctions will be displayed in the order of occurrence. To find out the causes of ABS malfunctions, use these on-board diagnostic results.
- If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness. The ABS HU/CM usually operates normally. Be careful when searching for the cause of malfunction.
- After repair, it is necessary to clear the DTC from the ABS HU/CM memory. Also, if the ABS related parts have been replaced, verify that the no DTC has been displayed after repairs.
- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the ABS CM (ABS motor or ABS motor relay or solenoid valve), the ABS warning light may not go out (*) even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **10 km/h {6.2 mph} or more**, make sure that ABS warning light goes out, and then clear the DTC.
  * The BRAKE system warning light also illuminates when any two wheels malfunction, or battery voltage drops **below 8 V**.
- When repairing, if the ABS related connectors are disconnected and the ignition switch is turned to the ON position, the ABS CM will mistakenly detect a fault and record it as a malfunction.
- To protect the ABS HU/CM, make sure the ignition switch is turned off before connecting or disconnecting the ABS CM connector.

(2) Malfunctions in hydraulic system
- Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in an ABS component or the conventional brake system.
- The ABS hydraulic unit contains delicate mechanical parts. If foreign material enters into the component, the ABS may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the ABS does not. Make sure foreign material does not enter when servicing the ABS (e.g. brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting
Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to inspect are:
  - — Connectors not fully seated.
  - — Wiring harness not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harness pass through the firewall, body panels, etc. are the major areas to be inspected.

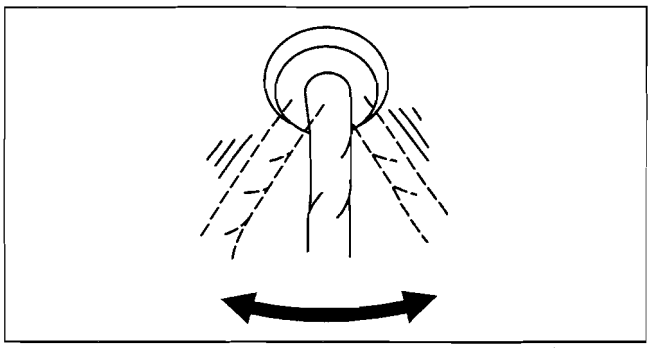
Inspection method for switch connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3zzw0000169

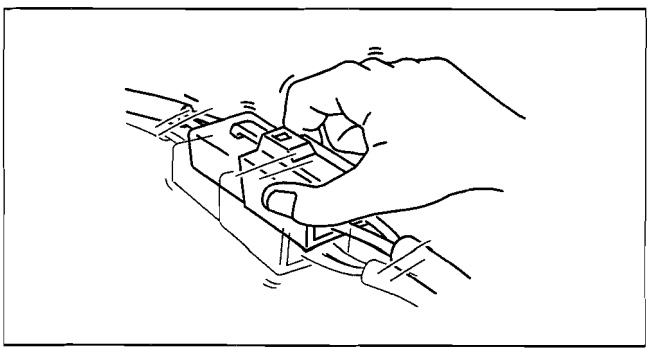
Inspection method for sensor connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3zzw0000169

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

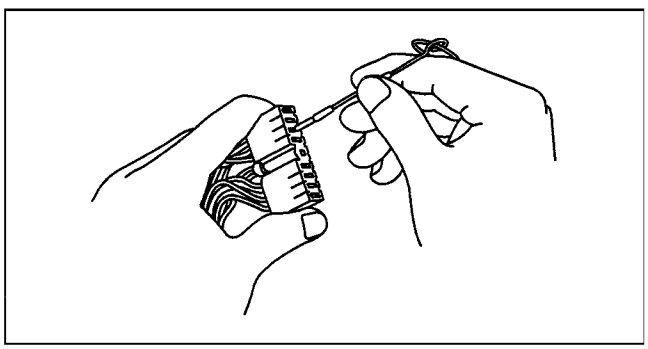
3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or malfunction occurs, inspect the sensor for poor connection and/or poor mounting.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

Connector terminal inspection method

1. Inspect the connection condition of each female terminal.
2. Insert the male terminal to the female terminal and Inspect the female terminal for looseness.



am3zzw0000170

SYMPTOM TROUBLESHOOTING[ABS]

id0403a5804200

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.
4	Both ABS warning light and BRAKE system warning light stay on **4 s or more** when the ignition switch is turned to the ON position.
5	ABS warning light stays on **4 s or more** when the ignition switch is turned to the ON position.
6	BRAKE system warning light stays on **4 s or more** when the ignition switch is turned to the ON position. (Parking brake is released.)
7	There is a malfunction in the system even through ABS warning light, BRAKE system warning light, do not illuminate.

x: Applicable

Troubleshooting item	Possible factor	ABS HU/CM	Instrument cluster	CAN communication	Battery	Brake fluid	Parking brake switch	Charging system	ABS HU/CM power supply (terminal N)	ABS HU/CM GND (terminal B)	Instrument cluster power supply (terminal 1G)	Instrument cluster GND	Conventional brakes	Brake pipe routing
1	Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.	X	X	X							X	X		
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.		X											
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.		X											
4	Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.	X	X	X	X			X	X	X				
5	ABS warning light stays on 4 s or more when the ignition switch is turned to the ON position.	X	X	X										
6	BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position. (Parking brake is released.)	X	X			X	X							
7	There is a malfunction in the system even though ABS warning light, BRAKE system warning light do not illuminate.	X											X	X

am3zzw0000170

NO.1 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801700

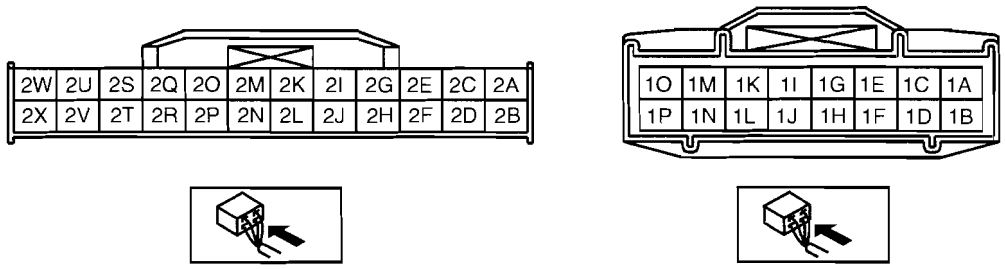
1	**Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.**

[TROUBLESHOOTING HINTS]
- **Instrument cluster or ABS HU/CM malfunction**
- **Improper configuration (instrument cluster)**

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See DTC Table.)
		No	Inspect the instrument cluster. If the instrument cluster is normal, inspect CAN communication. If instrument cluster has a malfunction, go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHT'S COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS** • Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?	Yes	Replace the instrument cluster. (open circuit in instrument cluster) (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.)
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE** • Is the instrument cluster ignition power supply fuse normal?	Yes	Go to the next step.
		No	Inspect for a short to ground on circuit of blown fuse. Repair or replace if necessary. Install appropriate amperage fuse.
*4	**VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER** • Turn the ignition switch to the ON position. • Measure voltage at instrument cluster connector terminal 1G. • Is the voltage **approx. 12 V?**	Yes	Replace the instrument cluster (open circuit in instrument cluster). (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.)
		No	Inspect for open circuit in wiring harness between the instrument cluster and ground. Repair or replace if necessary. Replace the ABS HU/CM. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.2 ABS WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801800

2	**ABS warning light does not illuminate when the ignition switch is turned to the ON position.**
[TROUBLESHOOTING HINTS] • **Instrument cluster malfunction**	

NO.3 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5801900

3	**BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.**
[TROUBLESHOOTING HINTS] • **Instrument cluster malfunction**	

NO.4 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

id0403a5802000

4	**Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.**

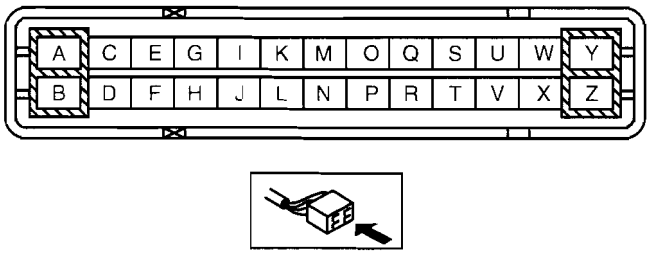
[TROUBLESHOOTING HINTS]
- **ABS HU/CM detects ABS proportioning system malfunction.**
- **ABS HU/CM detects low voltage in power supply (ABS CM ignition terminal N voltage is below approx. 8 V).**
- **ABS HU/CM does not operate.**
- **Malfunction of communication network**

Diagnostic procedure

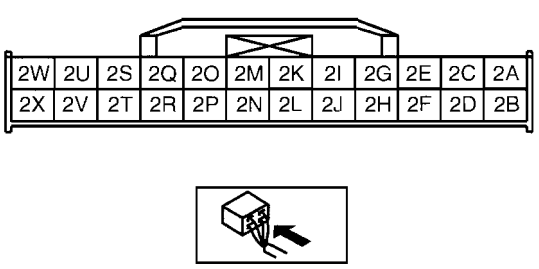
STEP	INSPECTION		ACTION
1	**INSPECT ABS HU/CM POWER SUPPLY FUSE** • Is the ABS HU/CM ignition power supply fuse normal?	Yes	Go to the next step. Inspect for a short to ground on blown fuse's circuit.
		No	Repair or replace if necessary. Install appropriate amperage fuse.
2	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is any error message displayed regarding communication between the ABS HU/CM and M-MDS?	Yes	If the communication error message is displayed even after inspecting according to the procedure displayed on the M-MDS, go to step 6.
		No	Go to the next step.
3	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Inspect the instrument cluster. If the instrument cluster is normal, go to the next step. If the instrument cluster malfunction repair the instrument cluster, go to the next step.
4	**INSPECT BATTERY** • Is the battery voltage normal?	Yes	Go to the next step.
		No	Inspect the battery and charging system. (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
5	**INSPECT CHARGING SYSTEM** • Is the battery voltage normal with electrical load (such as A/C, headlight) on and engine idling?	Yes	Go to the next step.
		No	Inspect the charging system (such as drive belt tension and generator). (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
6	**INSPECT ABS HU/CM IGNITION POWER SUPPLY SYSTEM (TERMINAL N)** • Disconnect the ABS HU/CM connector. • Turn the ignition switch to the ON position. • Inspect the voltage of connector terminal N. **Specification: approx. 8 V** • Is the voltage within the specification?	Yes	Replace the ABS HU/CM (open or short in ground circuit in the ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)
		No	Repair the wiring harness between the ABS HU/CM and ground.
7	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM GROUND FOR CONTINUITY** • Turn the ignition switch to the LOCK position. • Is there continuity between connector terminal B and ground?	Yes	If a malfunction error message is displayed on M-MDS in Step 1 inspection, go to the next step. If a malfunction error message is not displayed on M-MDS in Step 1 inspection, troubleshooting is completed.
		No	Repair the wiring harness between the ABS HU/CM and ground.
8	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY** • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
9	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** • Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.

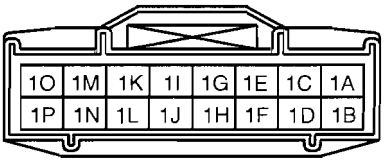
STEP	INSPECTION		ACTION
10	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** • Is there continuity between connector terminal H, L and DLC-2?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





NO.5 ABS WARNING LIGHT STAYS ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION[ABS]

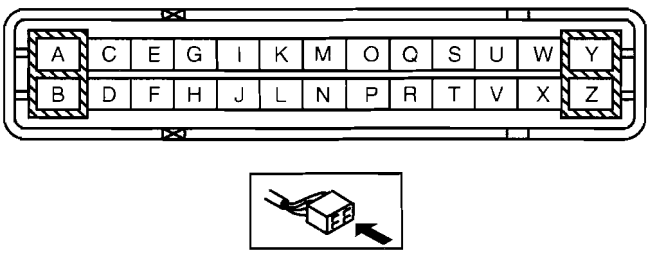
id0403a5802100

5	ABS warning light stays on 4 s or more when the ignition switch is turned to the ON position.
[TROUBLESHOOTING HINTS] • **ABS CM detects ABS system malfunction.**	

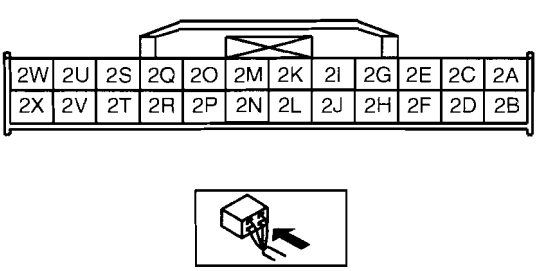
Diagnostic procedure

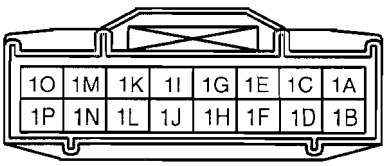
STEP	INSPECTION		ACTION
1	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY AND SHORT CIRCUIT** • Perform DTC inspection. • Is any error message displayed regarding communication between ABS HU/CM and M-MDS?	Yes	If the communication error message is displayed even after inspecting according to the procedures displayed in the M-MDS, go to Step 4.
		No	Go to the next step.
2	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Inspect the instrument cluster If the instrument cluster is normal, go to the next step. If the instrument cluster has a malfunction, repair the instrument cluster, go to the next step.
3	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY** • Disconnect the ABS HU/CM connector. • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
4	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** • Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.
5	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** Is there continuity between connector terminal H, L and ground?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.6 BRAKE SYSTEM WARNING LIGHT STAYS ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION (PARKING BRAKE IS RELEASED)[ABS]

id0403a5802200

6	**BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position. (Parking brake is released.)**

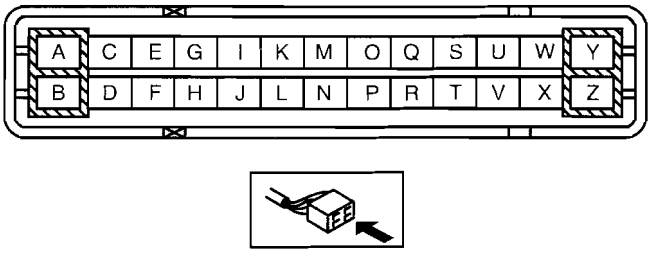
[TROUBLESHOOTING HINTS]
- **Instrument cluster malfunction**
- **Short to ground in circuit in parking brake switch**
- **Brake fluid level sensor is low**

Diagnostic procedure

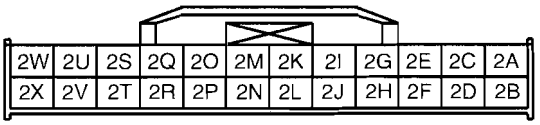
STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID LEVEL** • Is brake fluid level normal?	Yes	Go to the next step.
		No	Add brake fluid.
2	**INSPECT FOR DTCs IN ABS HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PARKING BRAKE SWITCH** • Disconnect the parking brake switch connector. • Does BRAKE system warning light go out with the ignition switch is turned to the ON position?	Yes	Replace the parking brake switch. (See 04-12-2 PARKING BRAKE LEVER REMOVAL/ INSTALLATION.)
		No	Perform the following inspection. Repair if necessary. • Short to ground in the wiring harness between the instrument cluster (BRAKE system warning light) and parking brake switch. Inspect the instrument cluster.
*4	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC -2 FOR CONTINUITY** • Disconnect the ABS HU/CM connector. • Is there continuity between connector terminal H, L and DLC-2?	Yes	Go to the next step.
		No	Repair the wiring harness between the ABS HU/CM and DLC-2.
*5	**INSPECT WIRING HARNESS BETWEEN ABS/ HU/CM AND DLC-2 FOR SHORT TO POWER SUPPLY** Is the voltage **approx. 12 V** at connector terminal H, L?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.
*6	**INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND** Is there continuity between connector terminal H, L and ground?	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM). (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.)

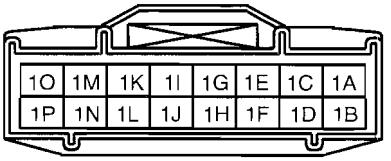
STEP	INSPECTION	ACTION

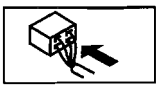
ABS HU/CM WIRING HARNESS-SIDE CONNECTOR

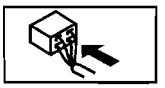


INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR









- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

NO.7 THERE IS MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DO NOT ILLUMINATE[ABS]

id0403a5802300

7	**There is a malfunction in system even though ABS warning light, BRAKE system warning light, do not illuminate.**
[TROUBLESHOOTING HINTS] • **There is a difference in size or air pressure between the front and rear tires.**	

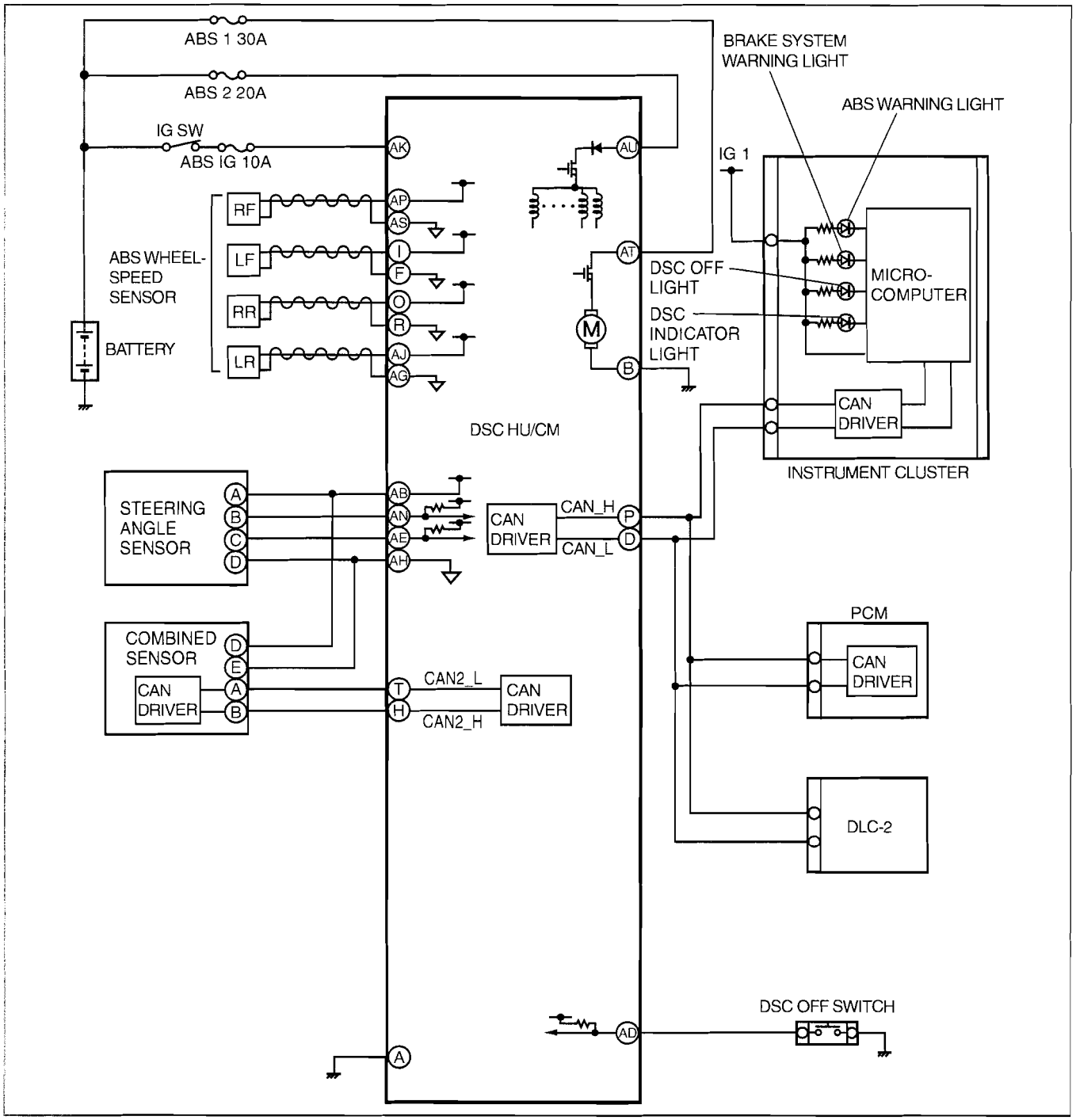
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN ABS HU/CM** Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)
		No	Go to the next step.
2	**INSPECT ABS HYDRAULIC UNIT** Perform the ABS hydraulic unit on-vehicle inspection. (See 04-13-2 ABS SYSTEM INSPECTION.) Does the system operate properly?	Yes	Inspect the conventional brake system.
		No	**If the wheels do not rotate:** Replace the ABS HU/CM. (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.) **If the wheels rotate but order in which wheels rotate is incorrect:** Inspect the brake pipe passage to the ABS HU/CM.

04-03B SYMPTOM TROUBLESHOOTING [DYNAMIC STABILITY CONTROL (DSC)]

SYSTEM WIRING DIAGRAM[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800100



am3uuw0000001

FOREWORD[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800200

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic inspection. To inspect the DTC, follow the DTC Inspection steps. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

PRECAUTION[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800300

1. The ABS warning light and/or BRAKE system warning light and/or DSC indicator light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS and DSC control
• ABS warning light • BRAKE system warning light • DSC indicator light	When the front wheels are jacked up, struck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for **60 s or more.**	After turning the ignition switch off, vehicle is driven at a speed **greater than 10 km/h {6.2 mph}** and normal operation is confirmed.	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control. DSC: Cuts control.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
	Battery voltage at DSC HU/CM ignition terminal drops **below approx. 8 V.**	Battery voltage rises **above approx. 8 V.**	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control. DSC: Cuts control.

2. Precautions during servicing of DSC. The DSC is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.
   (1) Malfunction in electrical system
   - The control module has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light and/or DSC indicator light will illuminate when there is a problem in the electrical system.
     Also, past and present malfunctions are recorded in the control module. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC-2, then turn the ignition switch to the ON position. As a result, the stored malfunctions will be displayed on the M-MDS in numeric order by connecting DLC-2. To find out the causes of DSC malfunctions, use these on-board diagnostic results.
   - If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness.
     The control module usually operates normally. Be careful when searching for the cause of malfunction.
   - After repair, it is necessary to clear the DTC from the control module memory.
     Also, if the DSC related parts have been replaced, verify that the no DTC has been displayed after repairs.
   - After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the control module, the ABS warning light may not go out even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **10 km/h {6.2 mph} or more**, make sure the ABS warning light goes out, and then clear the DTC.
   - When repairing, if the DSC related connectors are disconnected and the ignition switch is turned to the ON position, the control module will mistakenly detect a fault and record it as a malfunction.

   Caution
   - **In DSC vehicles, when the DSC HU/CM, combined sensor is replaced, perform the initialization procedure for each sensor. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)**

   - To protect the control module, make sure the ignition switch is turned off before connecting or disconnecting the control module connector.

   (2) Malfunctions in hydraulic system
   - Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in a DSC component or the conventional brake system.
   - The hydraulic unit contains delicate mechanical parts. If foreign material enters the component, the DSC may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the DSC does not. Make sure foreign materials does not enter when servicing the DSC (e.g. brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting
Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to inspect are:
  - — Connectors not fully seated.
  - — Wiring harness not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harness pass through the firewall, body panels, etc. are the major areas to be inspected.

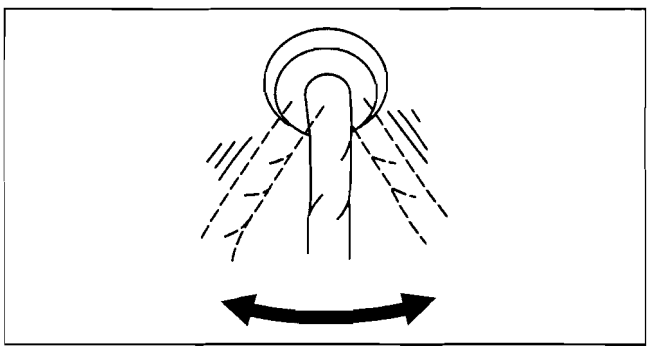
Inspection method for switch connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3uuw0000001

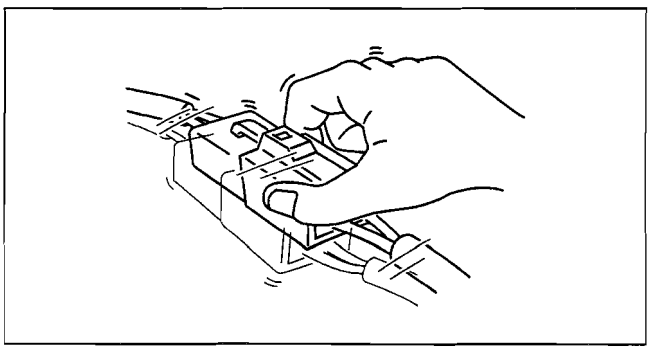
Inspection method for sensor connectors or wiring harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect poor connection.



am3uuw0000001

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

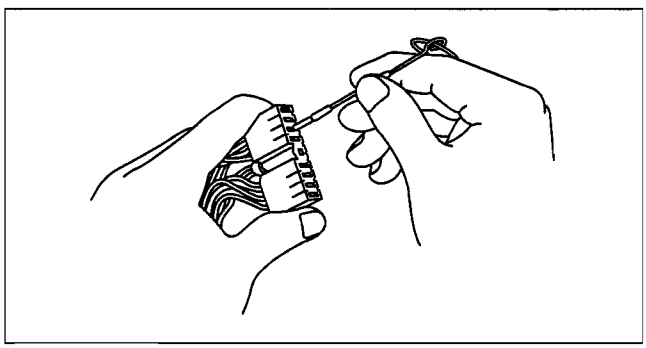
3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or malfunction occurs, inspect the sensor for poor connection and/or poor mounting.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

Connector terminal inspection method

1. Inspect the connection condition of each female terminal.
2. Insert the male terminal to the female terminal and Inspect the female terminal for looseness.



am3uuw0000001

SYMPTOM TROUBLESHOOTING[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2800400

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	Any of the following lights do not illuminate when the ignition switch is turned to the ON position. • ABS warning light • BRAKE system warning light • DSC indicator light • DSC OFF light
2	Any of the following lights remain on: • ABS warning light. • BRAKE system warning light • DSC indicator light • DSC OFF light
3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.
4	ABS or TCS*1 operates frequently.
	TCS does not work correctly.
5	DSC*2 operates frequently.
	DSC does not work correctly.

*1 : DSC system contains traction control function; DSC indicator light illuminates and goes out while DSC is operating.

*2 : DSC indicator light illuminates and goes out while DSC is operating.

x: Applicable

Troubleshooting item	Possible factor	DSC HU/CM	Instrument cluster	CAN communication	Each sensor installation	Battery	Charging system	Brake fluid	Parking brake	Tire	Tire air pressure	Control module power supply system	Control module ground system	Instrument cluster power supply system	Instrument cluster ground system	Conventional brake
1	Any of the following lights do not illuminate when the ignition switch is turned to the on position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	X	X	X										X	X	
2	Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	X	X	X	X	X	X	X	X			X	X			
3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light, and DSC OFF light do not illuminate.															X
4	ABS or TCS (*1) operates frequently. /TCS does not work correctly. (*1): DSC system function contains traction control function, DSC indicator light goes on and out while DSC operates.	X			X					X	X					
5	DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and out while DSC operates.	X			X											

*1: DSC system contains traction control function; DSC indicator light illuminates and goes out while DSC is operating.

*2: DSC indicator light illuminates and goes out while DSC is operating.

am3uuw0000001

NO.1 ANY OF THE FOLLOWING LIGHTS DO NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804500

1	**Any of the following lights do not illuminate when the ignition switch is turned to the ON position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).**

[TROUBLESHOOTING HINTS]
- **Inspect each light in the instrument cluster for malfunction.**
- **Poor connection at DSC HU/CM connector**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT IF MALFUNCTION IS IN INSTRUMENT CLUSTER SYSTEM OR OTHER SYSTEM** • Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?	Yes	Go to the next step.
		No	Inspect or repair the instrument cluster (power supply system, ground system).
3	**VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED** • Is the DSC HU/CM connector securely connected?	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
4	**VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED** • Are the DSC HU/CM connector terminal, instrument cluster connector terminal, or related connector terminals securely connected?	Yes	Replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)
		No	Connect the DSC HU/CM connector terminal or related connector terminal securely.

NO.2 ANY OF THE FOLLOWING LIGHTS REMAIN ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804600

2	**Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light)**

[TROUBLESHOOTING HINTS]
- **Brake fluid amount is low.**
- **Parking brake is not released.**
- **No connection at DSC HU/CM connector**
  (When DSC HU/CM connector goes out, ABS warning light and BRAKE system warning light illuminate.)
- **DSC HU/CM detected malfunction (input and output device malfunction).**
- **DSC HU/CM detects low voltage in power supply circuit.**
- **DSC HU/CM ground malfunction**
  (When DSC HU/CM ground is not securely connected, ABS warning light and BRAKE system warning light illuminate but no DTC is displayed.)
- **DSC HU/CM does not operate (DSC HU/CM malfunction).**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID AMOUNT AND VERIFY THAT PARKING BRAKE RELEASES** • Is the brake fluid amount normal? • Is the parking brake lever released?	Yes	Go to the next step.
		No	Add brake fluid or release the parking brake lever.
2	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
3	**INSPECT IF MALFUNCTION IS IN CONTROL MODULE CONNECTOR, TERMINAL OR OTHER** • Do ABS warning light and BRAKE system warning light go out **after 4 s** with the ignition switch turned to the ON position?	Yes	Temporary poor connection in control module connector. Inspect the DSC HU/CM connector, then go to Step 6. Inspect the DSC HU/CM connector terminal, then go to Step 7.
		No	Go to the next step.
4	**INSPECT BATTERY** • Is the battery voltage normal?	Yes	Go to the next step.
		No	Inspect the battery and charging system. (See 01-17A-4 BATTERY INSPECTION[LF, L3].) (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
5	**INSPECT CHARGING SYSTEM** • Is the battery voltage normal with electrical load (such as A/C, headlight) on and engine idling?	Yes	Go to the next step.
		No	Inspect the charging system (such as drive belt tension, generator). (See 01-17A-7 GENERATOR INSPECTION[LF, L3].)
6	**VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED** • Is the DSC HU/CM securely connected?	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
7	**VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED** • Are DSC HU/CM connector terminal or instrument cluster connector terminal, related connector terminals securely connected?	Yes	Replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)
		No	Connect the DSC HU/CM connector terminal or related connector terminals securely.

NO.3 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND DSC OFF LIGHT DO NOT ILLUMINATE[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804700

3	**There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.**
[TROUBLESHOOTING HINTS] • **There is a mechanical malfunction in the system.**	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT DSC SYSTEM** • Perform the DSC system inspection. • Is the system normal?	Yes	Inspect the conventional brake system.
		No	Repair or replace the malfunctioning part.

NO.4 ABS OR TCS*1 OPERATES FREQUENTLY/TCS DOES NOT WORK CORRECTLY *1: DSC SYSTEM FUNCTION CONTAINs TRACTION CONTROL FUNCTION, DSC INDICATOR LIGHT GOES ON AND OUT WHILE DSC OPERATES[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804800

4	**ABS or TCS (*1) operates frequently./TCS does not work correctly. (*1): DSC system function contains traction control function, DSC indicator light goes on and out while DSC operates.**

[TROUBLESHOOTING HINTS]
- **There is a difference in size or air pressure between the front and rear tires.**
- **Incorrect ABS wheel-speed signal is input to DSC HU/CM**
- **There is a malfunction in the engine control system (TCS malfunction).**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**INSPECT TIRE SIZE AND AIR PRESSURE** • Inspect the tire size and air pressure. • Are the size and air pressure as specified?	Yes	Go to the next step.
		No	Replace with the specified tires and adjust tire air pressure.
3	**INSPECT ABS WHEEL-SPEED SENSOR OUTPUT VALUE** • Inspect the output value from the ABS wheel-speed sensor. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.) • Is the output value normal?	Yes	Found malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING".
		No	• ABS wheel-speed sensor installation inspection: Inspect the ABS wheel-speed sensor for looseness and confirm it is securely adhered. • ABS sensor rotor installation inspection: Inspect the ABS sensor rotor for poor installation.

NO.5 DSC*2 OPERATES FREQUENTLY/DSC DOES NOT WORK CORRECTLY *2: DSC INDICATOR LIGHT GOES ON AND OUT WHILE DSC OPERATES[DYNAMIC STABILITY CONTROL (DSC)]

id0403b2804900

5	**DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and off while DSC operates.**

[TROUBLESHOOTING HINTS]
- **DSC HU/CM detected a malfunction (input and output device malfunction).**
- **Poor installation of combined sensor and/or steering angle sensor.**
  (If any of the above sensors are poorly installed, DSC may operate intermittently.)
- **Initialization was not performed for combined sensor, brake fluid pressure sensor when replacing DSC HU/CM, combined sensor.**
  (If initialization is not performed correctly, DSC may not work correctly.)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FOR DTCs IN DSC HU/CM** • Have DTCs been stored in memory?	Yes	Perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
2	**VERIFY THAT EACH SENSOR IS INSTALLED** • Are the combined sensor and steering angle sensor securely installed?	Yes	Go to the next step.
		No	Install the malfunctioning sensor securely.
*3	**VERIFY THAT EACH SENSOR IS INITIALIZED** • Did each sensor initialize after replacement of DSC HU/CM, combined sensor?	Yes	Find malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING."
		No	Perform initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)

04-10 GENERAL PROCEDURES

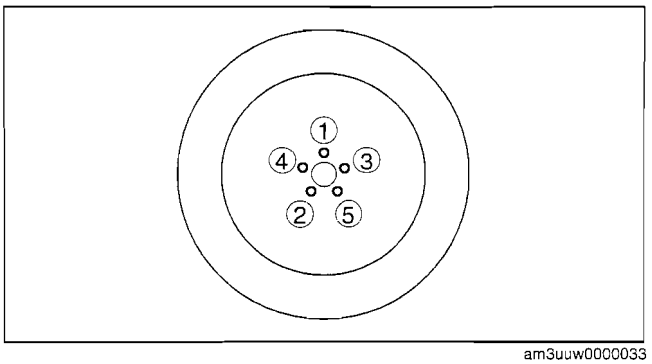
GENERAL PROCEDURES (BRAKE)

id041000800100

Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.

Tightening torque
88.2—117.6 N·m {9.00—11.99 Kgf·m, 65.06—86.73 ft·lbf}



am3uuw0000033

Brake Lines Disconnection

1. If any brake line has been disconnected during the procedures, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Caution
- **Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

Brake Pipe Flare Nut Tightening

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B) or any commercially available flare nut wrench.

Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

ABS Related Parts

1. Make sure that there are no DTCs in the ABS memory after working on ABS related parts. If there are any DTCs in the memory, clear them.

DSC Related Parts Sensor Initialization Procedure

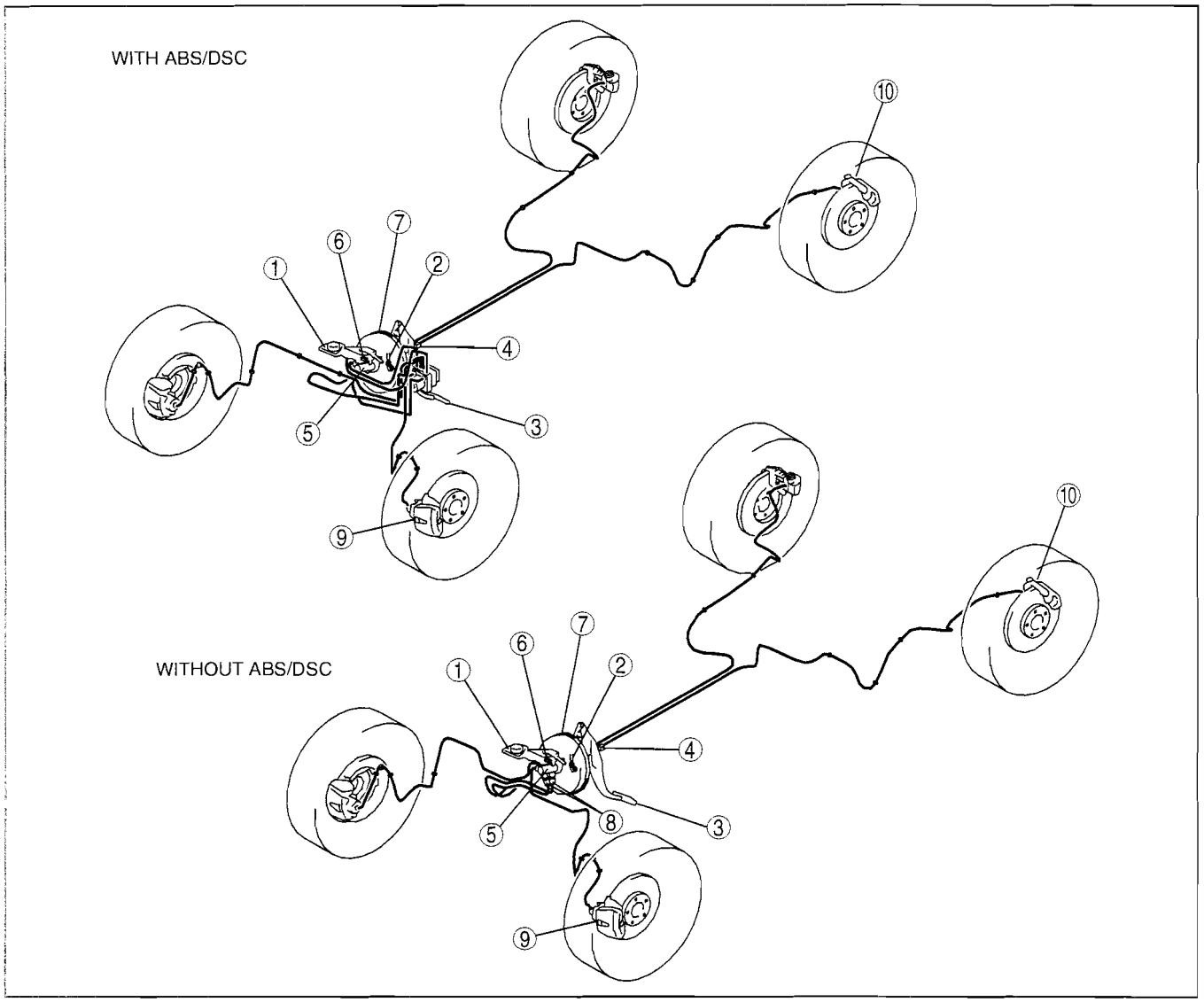
Warning
- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, when replacing or removing the following parts, make sure to perform the initialization procedure to ensure proper DSC operation.**

1. When replacing or removing the following parts, perform the initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
   - DSC HU/CM
   - Combined sensor

04-11 CONVENTIONAL BRAKE SYSTEM

CONVENTIONAL BRAKE SYSTEM LOCATION INDEX

id041100800100



c3u0411w001

1	Brake fluid (See 04-11-3 AIR BLEEDING.)
2	Vacuum line (See 04-11-4 VACUUM LINE INSPECTION.) (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Brake pedal (See 04-11-5 BRAKE PEDAL INSPECTION.) (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
4	Brake switch (See 04-11-8 BRAKE SWITCH INSPECTION.)
5	Master cylinder (See 04-11-9 MASTER CYLINDER REMOVAL/ INSTALLATION[LF, L3].) (See 04-11-10 MASTER CYLINDER REMOVAL/ INSTALLATION[L3 WITH TC].)
6	Brake fluid level sensor (See 04-11-11 BRAKE FLUID LEVEL SENSOR INSPECTION.)

7	Power brake unit (See 04-11-11 POWER BRAKE UNIT INSPECTION.) (See 04-11-13 POWER BRAKE UNIT REMOVAL/ INSTALLATION[LF, L3].) (See 04-11-14 POWER BRAKE UNIT REMOVAL/ INSTALLATION[L3 WITH TC].)
8	Proportioning valve (See 04-11-15 PROPORTIONING VALVE INSPECTION.)

9	Front brake (disc) (See 04-11-15 FRONT BRAKE (DISC) INSPECTION.) (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[LF, L3].) (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/INSTALLATION[L3 WITH TC].) (See 04-11-21 DISC PAD (FRONT) REPLACEMENT[LF, L3].) (See 04-11-22 DISC PAD (FRONT) REPLACEMENT[L3 WITH TC].) (See 04-11-23 CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[LF, L3].) (See 04-11-25 CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[L3 WITH TC].)

10	Rear brake (disc) (See 04-11-26 REAR BRAKE (DISC) INSPECTION.) (See 04-11-30 REAR BRAKE (DISC) REMOVAL/INSTALLATION.) (See 04-11-31 DISC PAD (REAR) REPLACEMENT.) (See 04-11-32 CALIPER (REAR) DISASSEMBLY/ASSEMBLY.)

AIR BLEEDING

id041100800200

Caution
- **Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

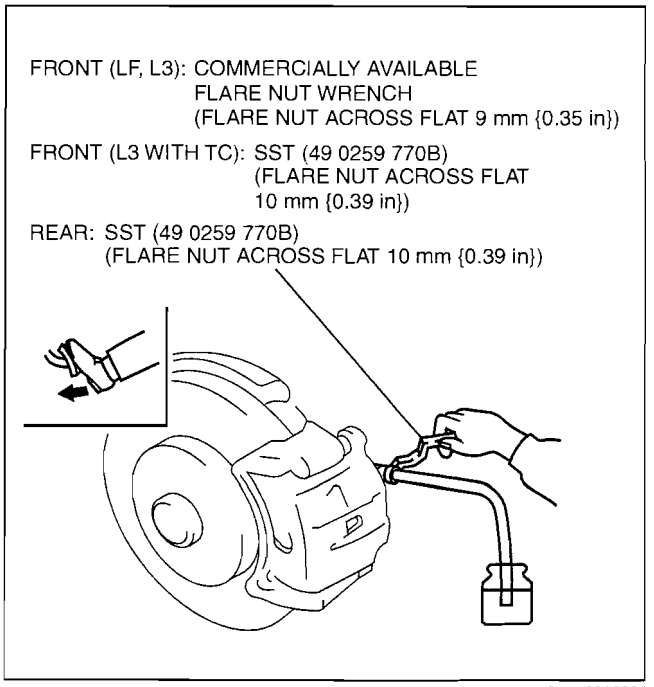
Note
- Keep the fluid level in the reserve tank at 3/4 full or more during the air bleeding.
- Begin air bleeding with the brake caliper that is furthest from the master cylinder.

Brake fluid type
SAE J1703, FMVSS 116 DOT3

1. Remove the bleeder cap on the brake caliper, and attach a vinyl tube to the bleeder screw.
2. Place the other end of the vinyl tube in a clear container and fill the container with fluid during air bleeding.
3. Working with two people, one should pump the brake pedal several times and depress and hold the pedal down.
4. While the brake pedal is depressed, the other should loosen the bleeder screw using the **SST** or any commercially available flare nut wrench, drain out any fluid containing air bubbles, and tighten the bleeder screw.

   Tightening torque
   Front (LF, L3): 7—9 N·m {72—91 kgf·cm, 70—79 in·lbf}
   Front (L3 WITH TC): 12—16 N·m {123—163 kgf·cm, 107—141 in·lbf}
   Rear: 12—16 N·m {123—163 kgf·cm, 107—141 in·lbf}

5. Repeat Steps 3 and 4 until no air bubbles are seen.
6. Perform air bleeding as described in the above procedures for all brake calipers.
7. After air bleeding, inspect the following:
   - Brake operation
   - Fluid leakage
   - Fluid level

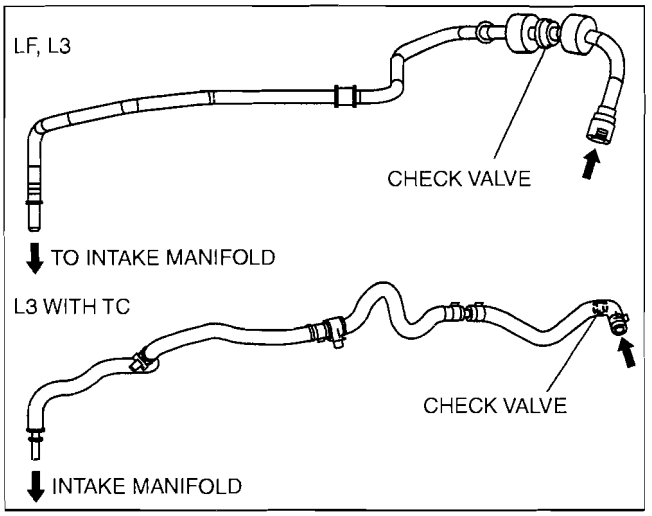


am3uuw0000026

VACUUM LINE INSPECTION

id041100801500

1. Remove the vacuum hose. (See 04-11-4 VACUUM HOSE REMOVAL/INSTALLATION.)
2. Verify that air can be blown from the power brake unit side of the vacuum hose towards the intake manifold side, and that air cannot be blown in the opposite direction.
   - If there is any malfunction of the inner check valve, replace it together with the vacuum hose as a single unit.

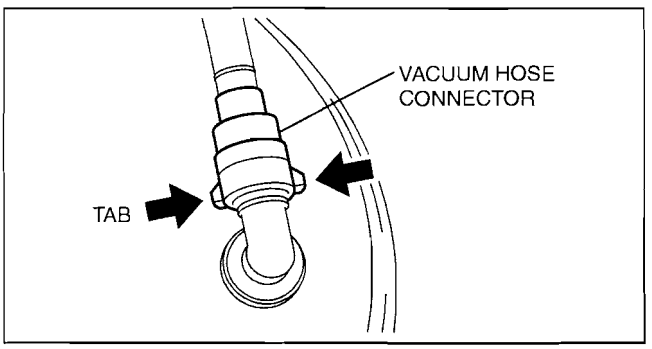


am3uuw0000039

VACUUM HOSE REMOVAL/INSTALLATION

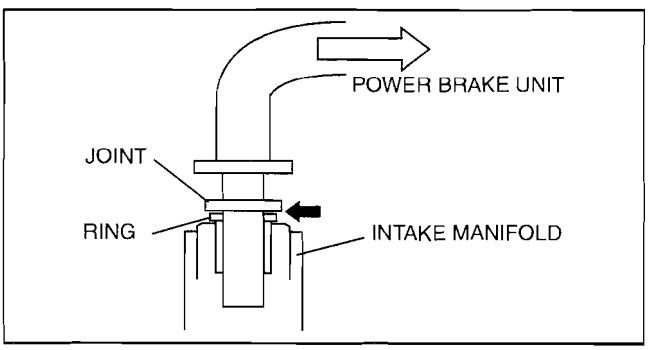
id041100801600

1. Disconnect the vacuum hose connector from the power brake unit while pressing the tabs of the vacuum hose connector. (LF, L3)
2. Pinch open the clip using pliers and disconnect the vacuum hose from the power brake unit. (L3 WITH TC)



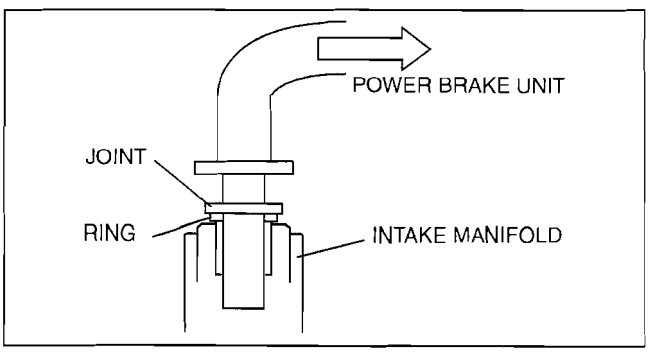
am3uuw0000027

3. Insert a thin flathead screwdriver at the point indicated by the arrow in the figure, push the ring down and disconnect the vacuum hose from the intake manifold.
4. Remove the vacuum hose.
5. Install in the reverse order of removal.



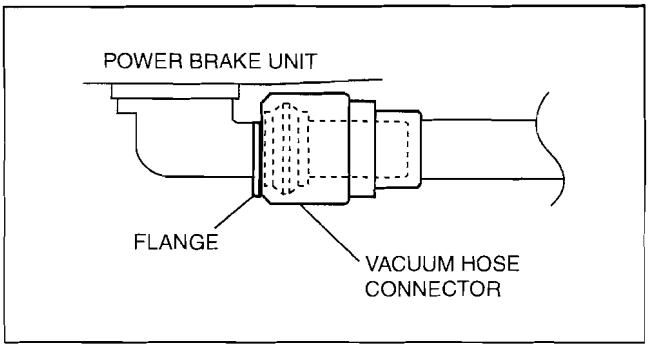
am3uuw0000027

6. Verify that the vacuum hose is inserted so that the joint contacts the intake manifold ring. (LF, L3)
7. Insert the vacuum hose connector to the power brake unit. (LF, L3)



am3uuw0000027

8. Verify that the vacuum hose is inserted so that the connector contacts the power brake unit flange. (LF, L3)



am3uuw0000027

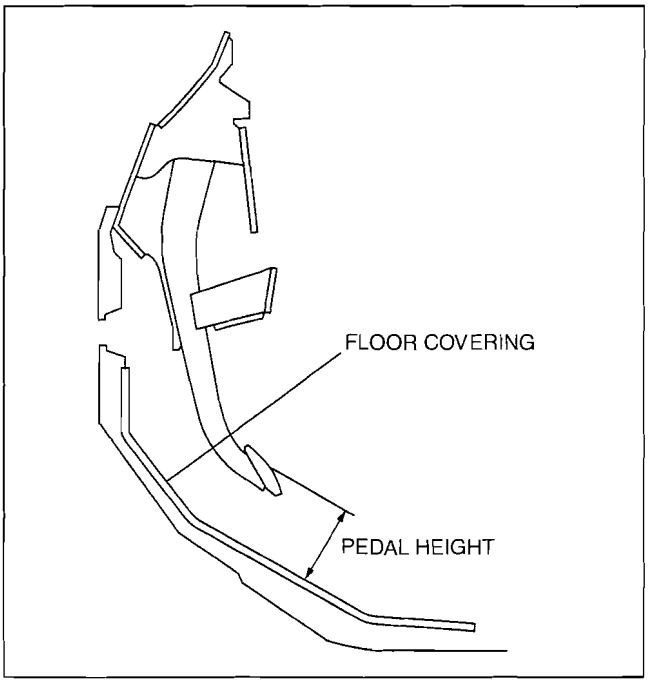
BRAKE PEDAL INSPECTION

id041100801100

Pedal Height Inspection

1. Measure the distance from the center of the upper surface of the pedal pad to the floor covering and verify that it is as specified.
   - If not within the specification, replace the brake pedal.

Brake pedal height (reference value)
136.4 mm {5.37 in}



am3uuw0000074

Pedal Play Inspection

1. Pump the pedal several times to release the vacuum in the power brake unit.
2. Gently depress the pedal by hand and measure the pedal play.
   - If not within the specification, inspect the wear of the joint pin. Replace it if there is any malfunction.

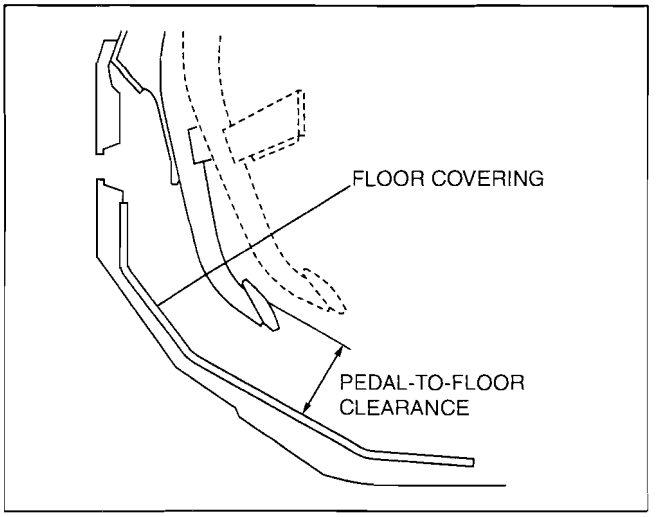
Brake pedal play
4.0—8.4 mm {0.16—0.33 in}

Note
- If there is no malfunction in the joint pin, there is a possibility that the power brake unit has some malfunction. Verify that there are no malfunctions, and replace it if necessary.

Pedal-to-floor Clearance Inspection

1. Start the engine and depress the brake pedal with a force of **147 N {15.0 kgf, 33.0 lbf}**.
2. Measure the distance from the center of the upper surface of the pedal pad to the floor covering and verify that it is as specified.
   - If it is less than the specification, inspect for air in the brake line.

Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 kgf, 33.0 lbf})
89.8 mm {3.54 in} or more



am3uuw0000074

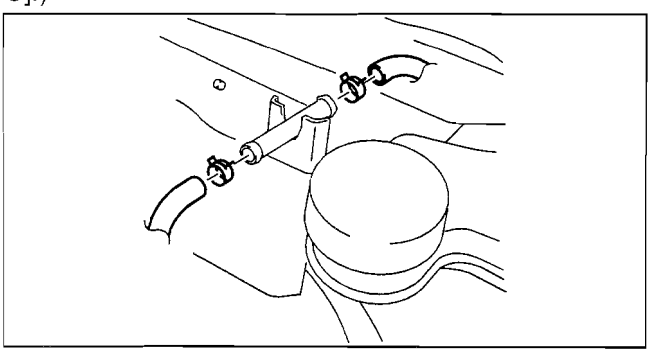
BRAKE PEDAL REMOVAL/INSTALLATION

id041100801200

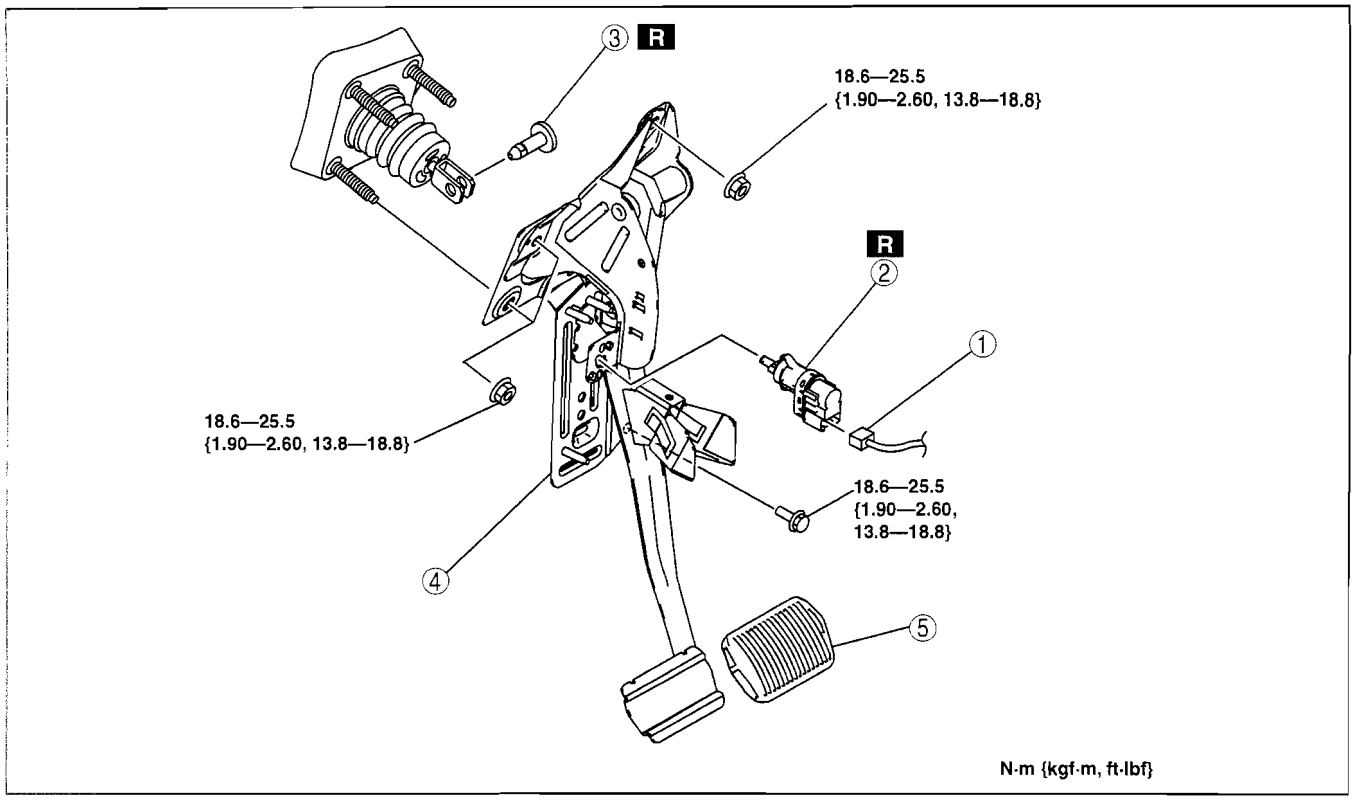
Caution

- **The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch is inserted into the installation hole on the brake pedal and rotated to fix in place. If the brake switch is not properly installed, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake pedal is properly installed and fully released before installing the brake switch to the pedal.**
- **Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.**

1. Remove the charge air cooler cover. (L3 WITH TC) (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
3. Disconnect the vacuum hose from the insulator pipe as shown in the figure. (L3 WITH TC)
4. Remove the insulator. (L3 WITH TC) (see 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
5. Disconnect the brake pipe (master cylinder side). (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].) (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the accelerator pedal. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3].) (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)
7. Remove in the order indicated in the table.


am3uuw0000038

8. Install in the reverse order of removal.



c3u0411w008

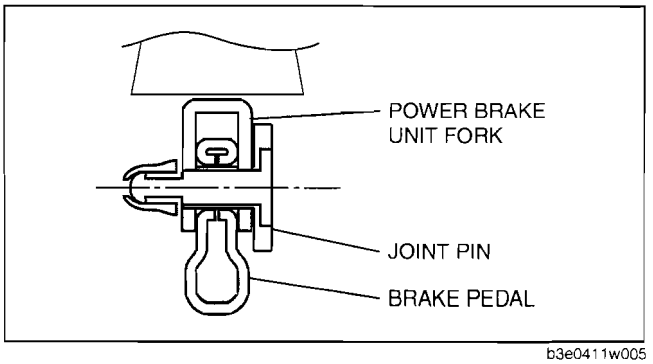
1	Brake switch connector
2	Brake switch (See 04-11-8 Brake Switch Installation Note.)
3	Joint pin (See 04-11-7 Joint Pin Installation Note.)
4	Brake pedal (See 04-11-7 Brake Pedal Removal Note.)
5	Pedal pad

Brake Pedal Removal Note

1. Remove the brake pedal installation bolts and nuts.
2. Move the power brake unit to the vehicle front where the power brake unit fork does not interfere with the brake pedal arm.
3. Remove the brake pedal.

Joint Pin Installation Note

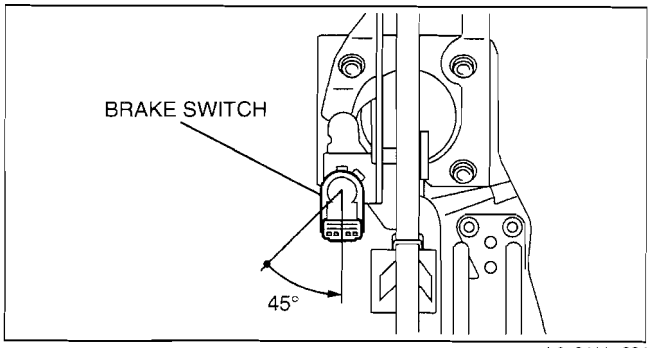
1. Install the new joint pin by aligning the pin holes of the brake pedal and power brake unit fork.
2. Verify that the joint pin touches the power brake unit fork completely.



b3e0411w005

Brake Switch Installation Note

1. Inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)
2. With the brake pedal fully released, insert a new brake switch into the installation hole on the brake pedal.
3. Secure the brake switch by turning it counterclockwise **45°**.



b3e0411w004

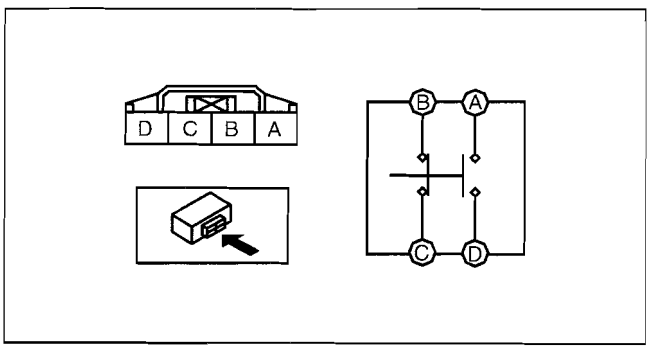
BRAKE SWITCH INSPECTION

id041100801900

Caution

- **Inspect the brake switch with it installed to the brake pedal, otherwise the brake switch may not operate normally. If the brake switch is removed from the brake pedal, replace the brake switch with a new one.**

1. Remove the lower panel.
2. Remove the column cover.
3. Disconnect the brake switch connector.
4. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the brake switch.



c3u0411w005

O—O : Continuity

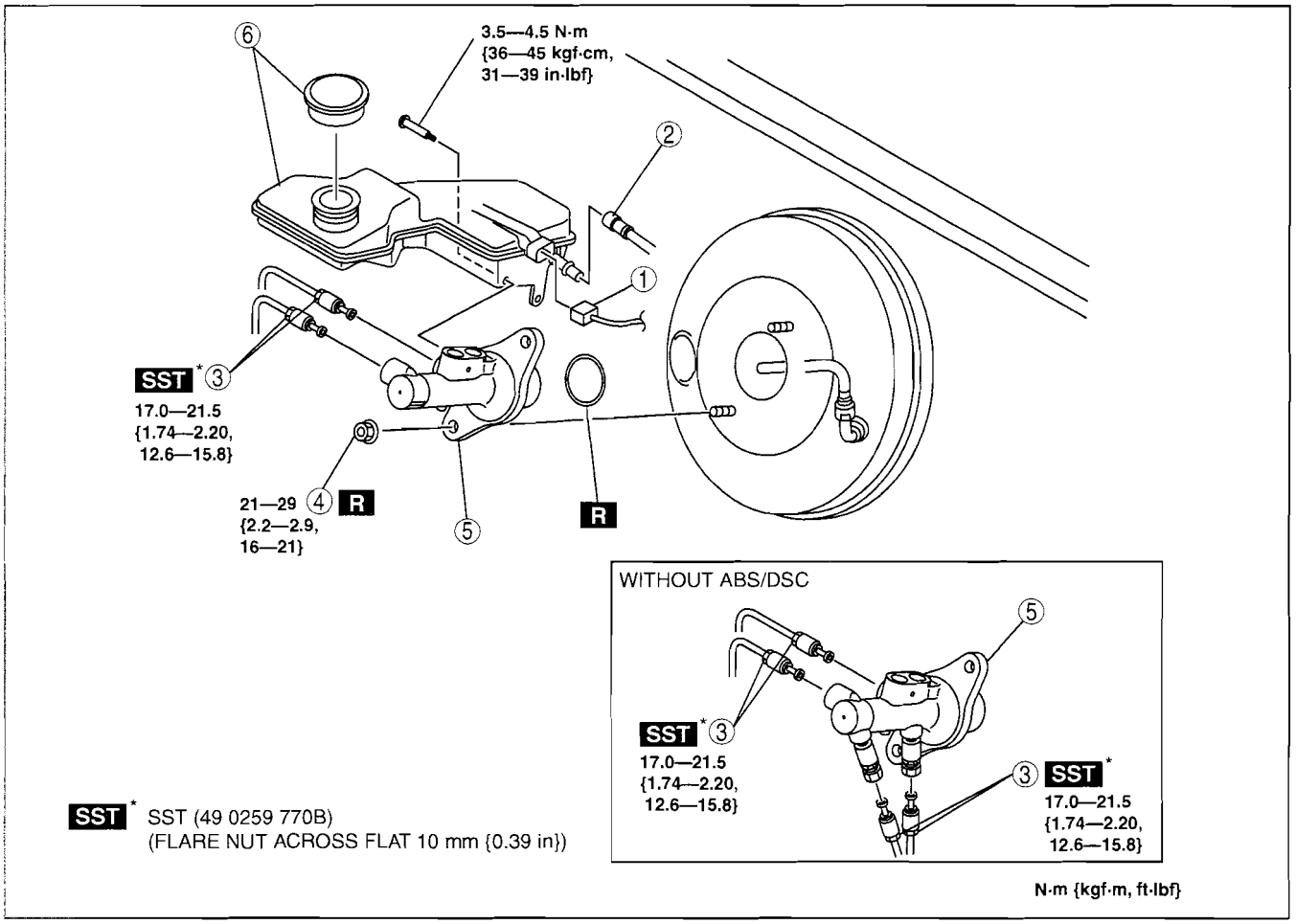
Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed	O			O
When the brake pedal is not depressed		O	O	

c3u0411w006

MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3]

id041100801338

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

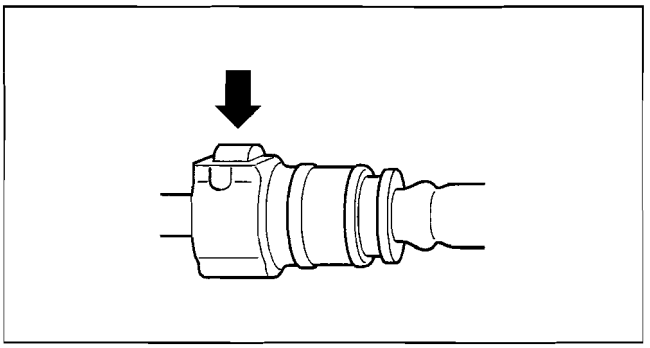


am3uuw0000026

1	Brake fluid level sensor connector
2	Reserve hose (MTX) (See 04-11-9 Reserve Hose (MTX) Removal Note.) (See 04-11-9 Reserve Hose (MTX) Installation Note.)
3	Brake pipe
4	Nut
5	Master cylinder
6	Reserve tank, cap

Reserve Hose (MTX) Removal Note

1. Remove the reserve hose from the reserve tank while pressing the point indicated by the arrow in the figure.



am3uuw0000026

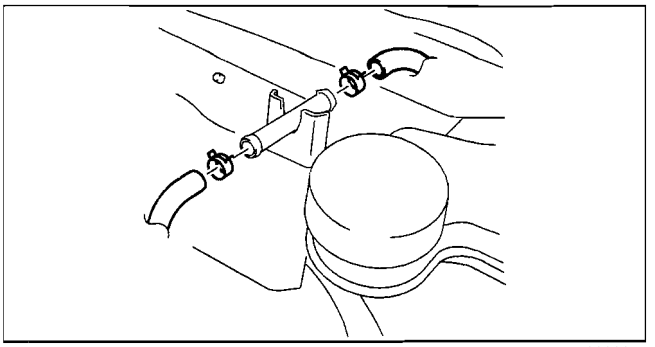
Reserve Hose (MTX) Installation Note

1. Insert the reserve hose to the reserve tank until a click is heard.
2. Verify that the reserve hose is firmly installed by pulling it, and push it into the reserve tank again.

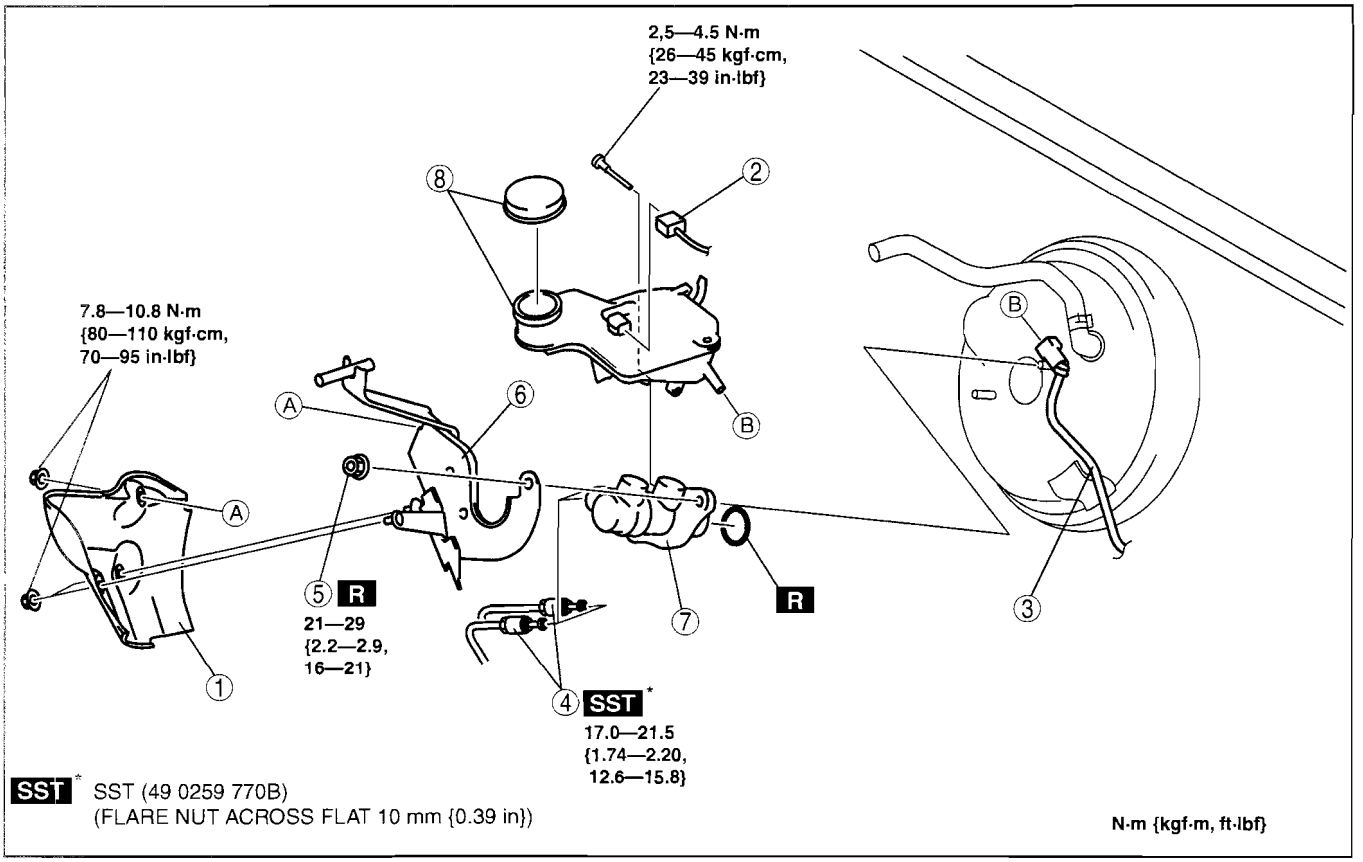
MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC]

id041100801339

1. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the vacuum hose from the insulator pipe as shown in the figure.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



am3uuw0000038



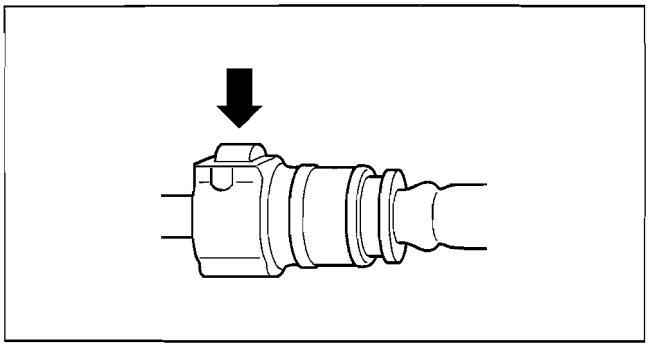
am3uuw0000039

1	Insulator
2	Brake fluid level sensor connector
3	Reserve hose (See 04-11-11 Reserve Hose Removal Note.) (See 04-11-11 Reserve Hose Installation Note.)
4	Brake pipe
5	Nut

6	Insulator bracket (See 04-11-11 Insulator Bracket, Master Cylinder Removal Note.) (See 04-11-11 Insulator Bracket, Master Cylinder Installation Note.)
7	Master cylinder (See 04-11-11 Insulator Bracket, Master Cylinder Removal Note.) (See 04-11-11 Insulator Bracket, Master Cylinder Installation Note.)
8	Reserve tank, cap

Reserve Hose Removal Note

1. Remove the reserve hose from the reserve tank while pressing the point indicated by the arrow in the figure.



am3uuw0000027

Insulator Bracket, Master Cylinder Removal Note

1. Remove the insulator bracket and master cylinder from the power brake unit as a single unit.
2. Remove the insulator bracket from the master cylinder.

Insulator Bracket, Master Cylinder Installation Note

1. Temporarily install the insulator bracket to the master cylinder.
2. Install the insulator bracket and master cylinder to the power brake unit as a single unit.

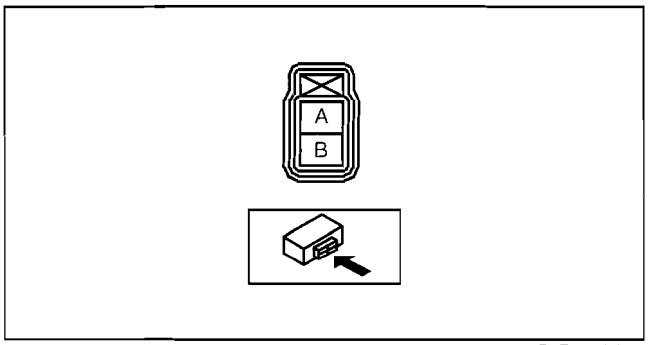
Reserve Hose Installation Note

1. Insert the reserve hose to the reserve tank until a click is heard.
2. Verify that the reserve hose is firmly installed by pulling it, and push it into the reserve tank again.

BRAKE FLUID LEVEL SENSOR INSPECTION

id041100801400

1. Disconnect the brake fluid level sensor connector from the master cylinder.
2. Inspect for continuity according to fluid level between the brake fluid level sensor terminals.
   - If not as indicated in the table, replace the reserve tank.



B3E0411W039

O—O: Continuity

Condition	Terminal	
	A	B
Above MIN		
Below MIN	O	O

chu0411w017

POWER BRAKE UNIT INSPECTION

id041100801700

Note

- The following inspection methods are simple inspection methods to judge the function of the power brake unit.
- If there is any malfunction in the power brake unit, replace the power brake unit as a single unit.

Without Using SST

Operation inspection

1. With the engine stopped, pump the pedal a few times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after starting the engine, the unit is normal.

Vacuum function inspection

1. Start the engine.
2. Stop the engine after driving the vehicle for **1—2 min.**
3. Depress the pedal with normal force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is normal.
   - If a problem is found, inspect for damage to or improper installation of the check valve and vacuum hose. After repairing, inspect again.

Vacuum loss function inspection

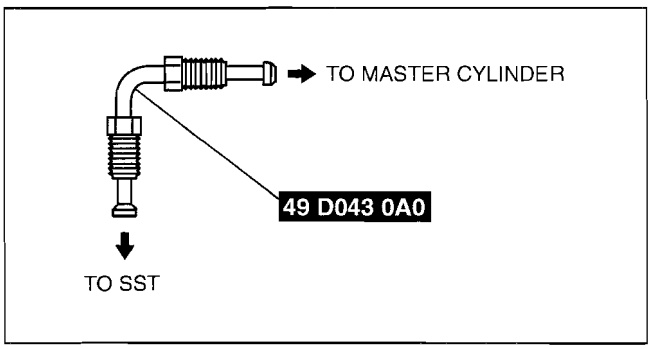
1. Start the engine.
2. Depress the pedal with normal force.
3. With the pedal depressed, stop the engine.
4. Hold the pedal depressed for **approx. 30 s.**
5. If the pedal height does not change during this time, the unit is normal.

Using SST

Pre-inspection preparation

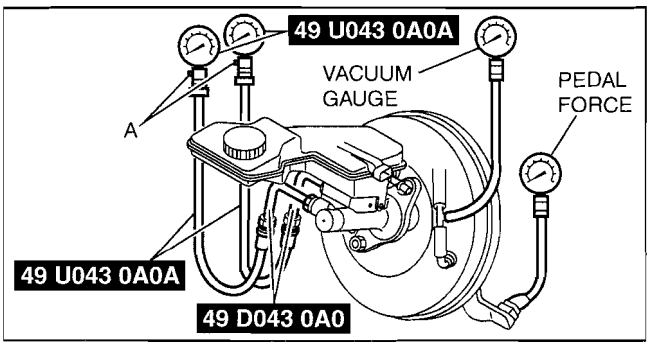
1. Install the **SST** (49 D043 0A0) to the master cylinder in the orientation shown in the figure.

   Note
   - When installing the **SST** (49 D043 0A0) to the master cylinder, use a commercially available flare nut wrench.
     — Flare nut across flat: **12 mm {0.47 in}**



c3u0411w009

2. Connect the **SSTs**, a vacuum gauge, and a pedal force gauge to the master cylinder, and bleed the air from the **SSTs** and the brake line. (Bleed the air from the **SSTs** using air bleed valve A.)



c3u0411w010

Vacuum loss inspection

1. Start the engine.
2. Depress the brake pedal with a force of **200 N {20.4 kgf, 44.9 lbf}**.
3. Stop the engine when the vacuum gauge reading reaches **68 kPa {510 mmHg, 20.1 inHg}** with the pedal depressed.
4. With the engine off, observe the vacuum gauge for **15 s.**
5. If the gauge has dropped **3.3 kPa {25 mmHg, 1.0 inHg}** or less, the unit is normal.

Lack of hydraulic pressure inspection

1. If the pedal force and fluid pressure correlation is within the specification with the engine stopped and a vacuum amount of **0 kPa {0 mmHg, 0 inHg}**, the system is normal.

Master cylinder fluid pressure

Vacuum amount at 0 kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbf}	500 kPa {5.10 kgf/cm^2, 72.6 psi} or more

Hydraulic pressure inspection

1. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
2. At this time, apply the indicated pedal force and if the fluid pressure is within the specification, the unit is normal.

Master cylinder fluid pressure (except L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	6,500 kPa {66.29 kgf/cm^2, 942.8 psi} or more

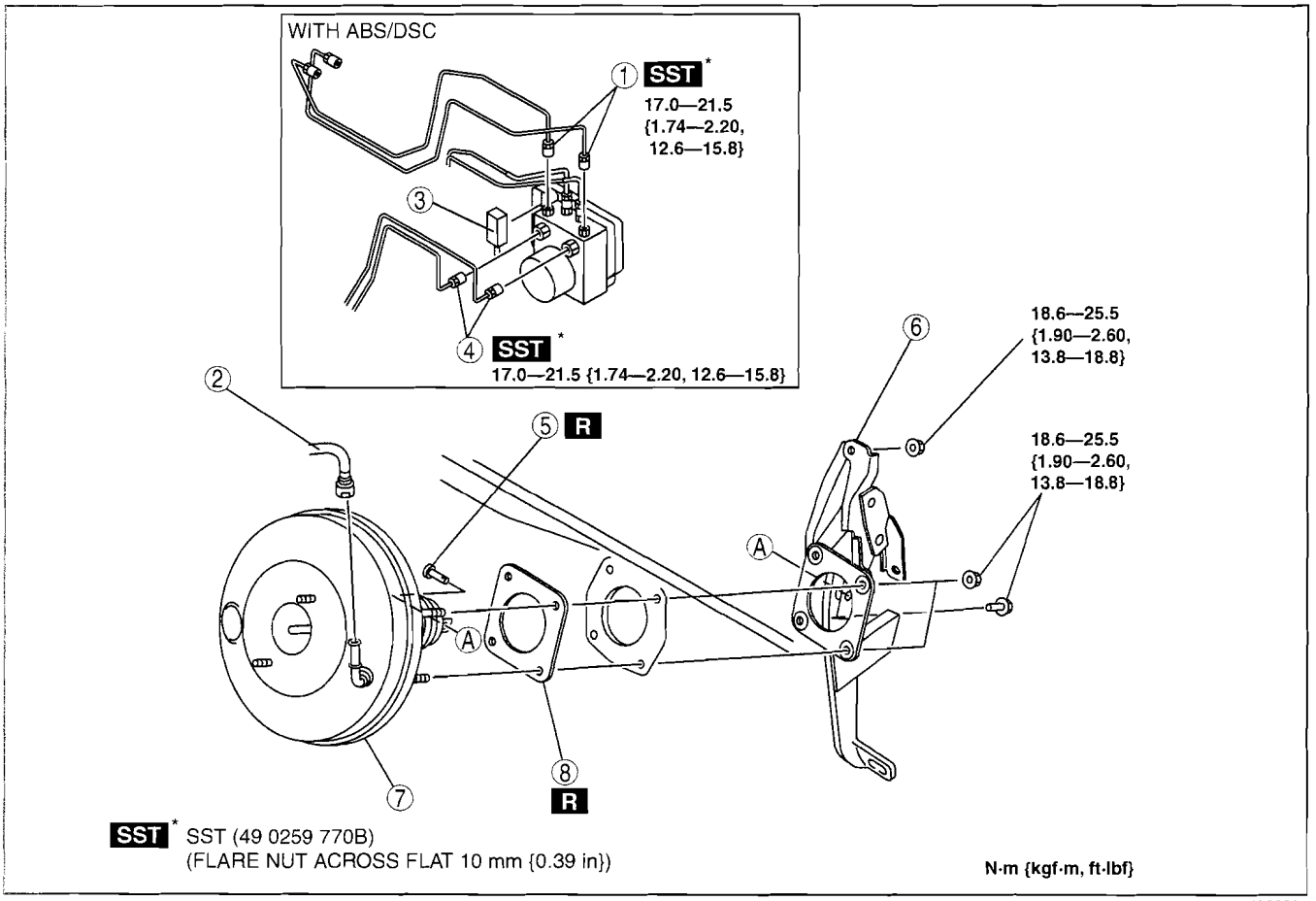
Master cylinder fluid pressure (L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	7,000 kPa {71.39 kgf/cm^2, 1,016 psi} or more

POWER BRAKE UNIT REMOVAL/INSTALLATION[LF, L3]

id041100801838

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the master cylinder. (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].)
3. Remove the brake switch connector.
4. Remove the accelerator pedal. (See 01-13A-11 ACCELERATOR PEDAL REMOVAL/INSTALLATION[LF, L3].)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. After installation, inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)



am3uuw0000027

1	Brake pipe
2	Vacuum hose (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Connector (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
4	Brake pipe

5	Joint pin (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
6	Brake pedal component (See 04-11-14 Brake Pedal Component Removal Note.)
7	Power brake unit
8	Gasket

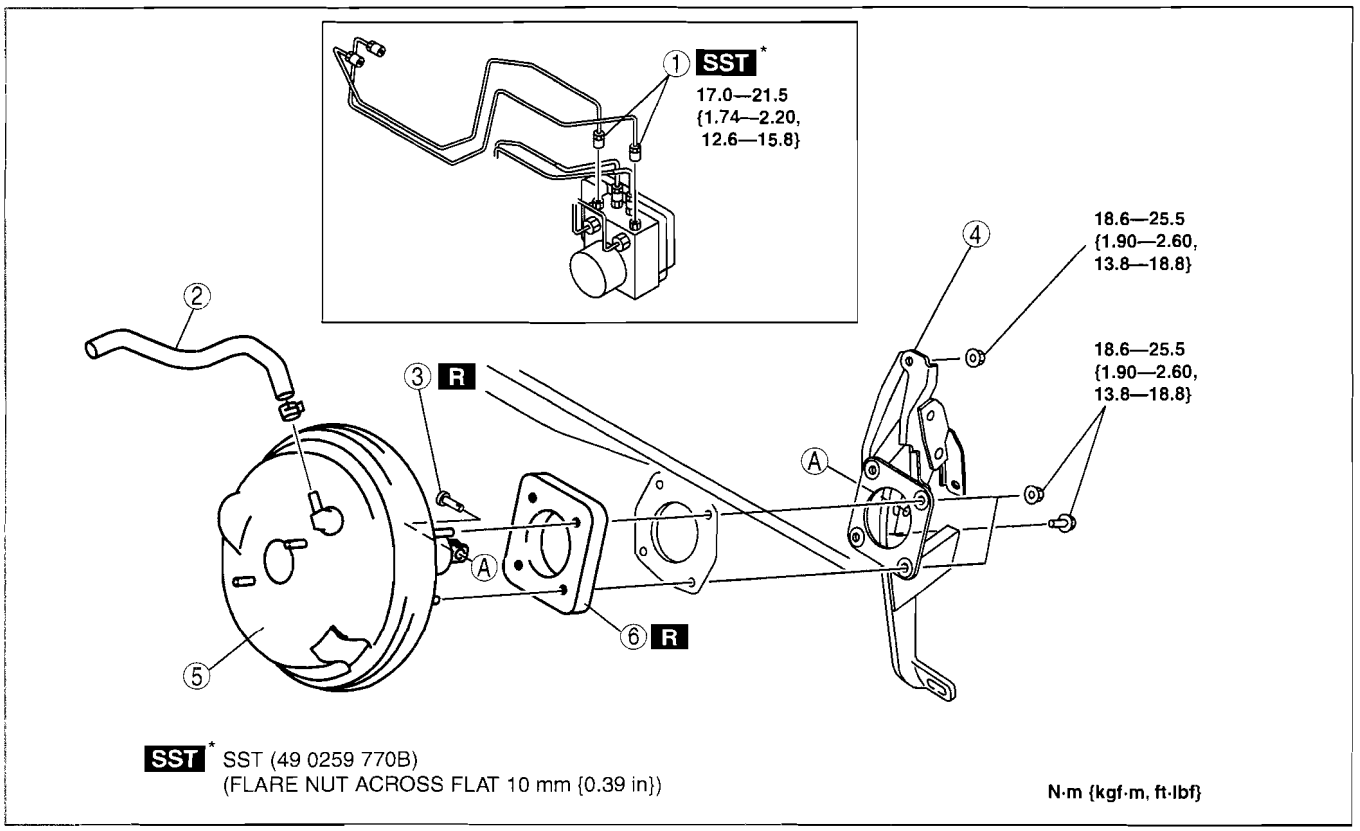
Brake Pedal Component Removal Note

1. Remove the brake pedal installation bolt and nuts.
2. Move the power brake unit toward the vehicle front.
3. Remove the brake pedal component.

POWER BRAKE UNIT REMOVAL/INSTALLATION[L3 WITH TC]

id041100801839

1. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the master cylinder. (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].)
3. Remove the air hose and air duct. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
4. Remove the brake switch connector.
5. Remove the accelerator pedal. (See 01-13B-18 ACCELERATOR PEDAL REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. After installation, inspect the brake pedal. (See 04-11-5 BRAKE PEDAL INSPECTION.)



am3uuw0000039

1	Brake pipe
2	Vacuum hose (See 04-11-4 VACUUM HOSE REMOVAL/ INSTALLATION.)
3	Joint pin (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)

4	Brake pedal component (See 04-11-14 Brake Pedal Component Removal Note.)
5	Power brake unit
6	Gasket

Brake Pedal Component Removal Note

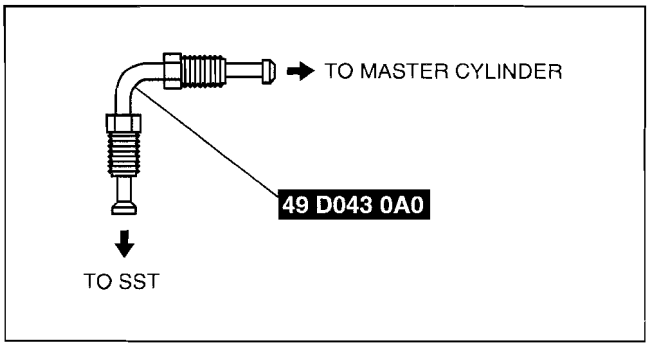
1. Remove the brake pedal installation bolt and nuts.
2. Move the power brake unit toward the vehicle front.
3. Remove the brake pedal component.

PROPORTIONING VALVE INSPECTION

id041100804300

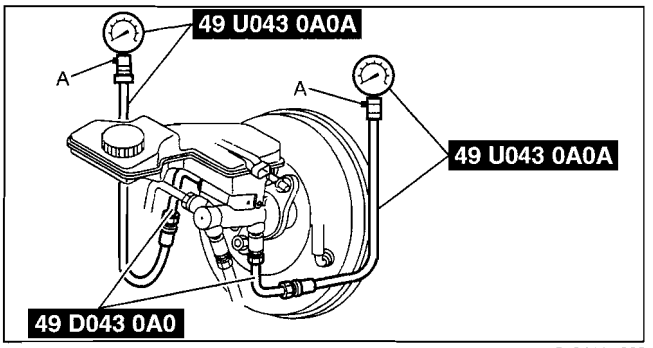
1. Disconnect the master cylinder brake pipes, and install the **SST** (49 D043 0A0) to the master cylinder orientated as shown in the figure.

   Note
   - Use a commercially available flare nut wrench when installing the **SST** (49 D043 0A0) to the master cylinder.
     — Flare nut across flat: **12 mm {0.47 in}**



c3u0411w009

2. Connect the **SSTs** as shown in the figure, and bleed the air from the **SSTs** and the brake line. (Bleed the air from the **SSTs** using air bleed valve A.)
3. Inspect the rear brake fluid pressure when the front brake fluid pressure is adjusted to the level indicated in the table.
   - If not within the specification, replace the master cylinder.



c3u0411w003

04-11

Proportioning valve fluid pressure

Front brake fluid pressure (kPa {kgf/cm^2, psi})	Rear brake fluid pressure (kPa {kgf/cm^2, psi})
5,000 {50.99, 725.2}	3,500—3,700 {35.70—37.72, 507.7—536.6}
10,000 {101.97, 1450.4}	4,950—5,250 {50.48—53.53, 718.0—761.4}

FRONT BRAKE (DISC) INSPECTION

id041100800800

Brake Judder Repair Hints

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. The steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

Brake pedal vibration

1. When applying the brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

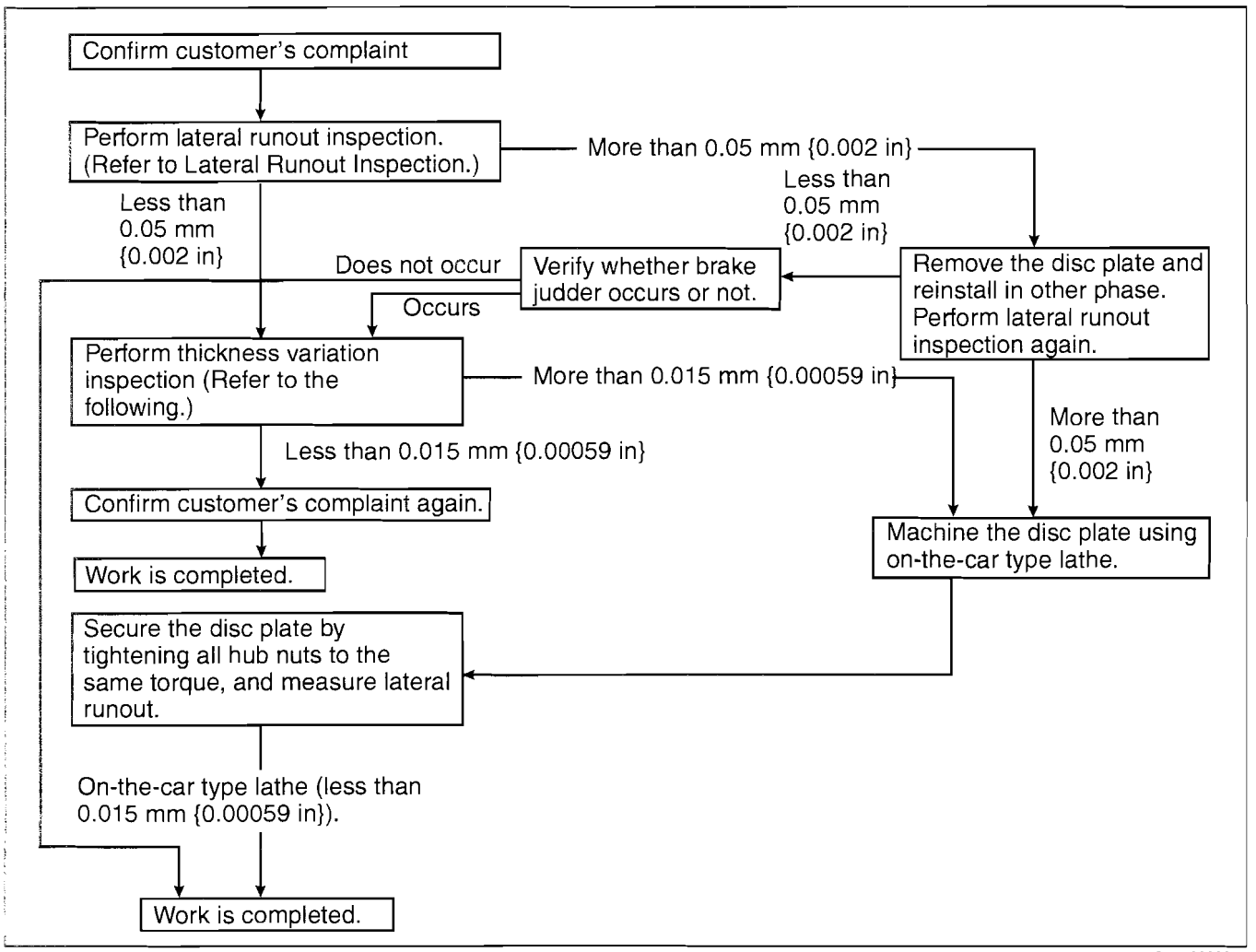
The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of the disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

Due to corrosion, the thickness and friction coefficient of the disc plate change.

1. If the vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of the disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



am3uuw0000037

Lateral runout inspection

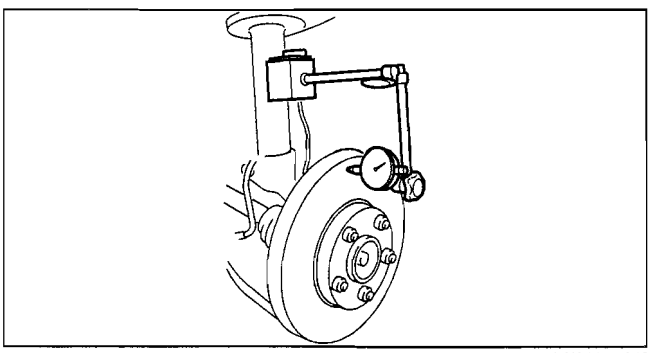
1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

Note

- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of the disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Front disc plate runout limit
0.05 mm {0.002 in}



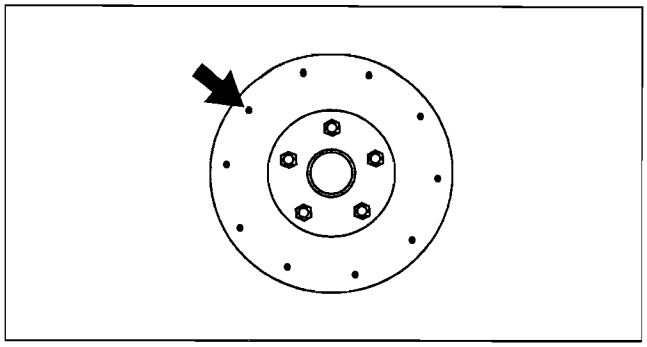
b3j0411w049

Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within the specification, machine the disc plate using a lathe.

Thickness variation limit
0.015 mm {0.00059 in}

Warning
- **Do not exceed minimum disc plate thickness.**



am3uuw0000037

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

Minimum front disc plate thickness
23 mm {0.91 in}

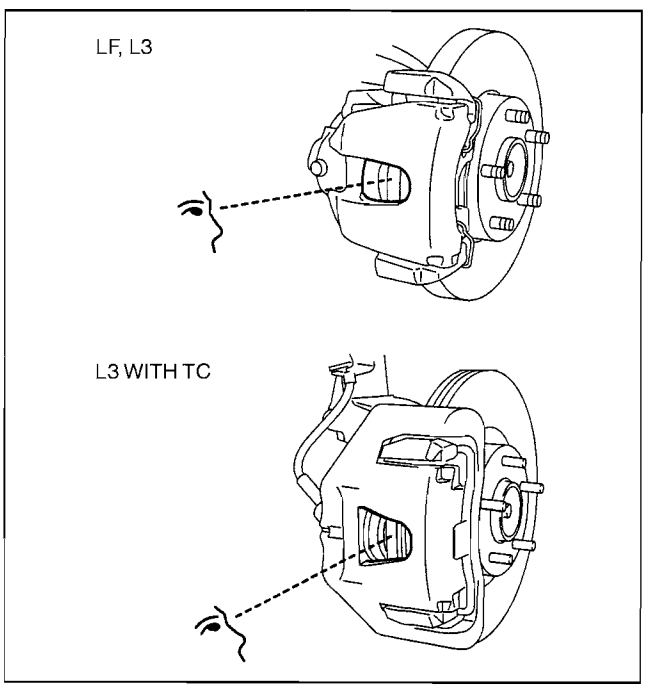
Minimum front disc plate thickness after machining using a brake lathe on-vehicle
23.8 mm {0.94 in}

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Verify the remaining thickness of the pads.

Minimum front disc pad thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.

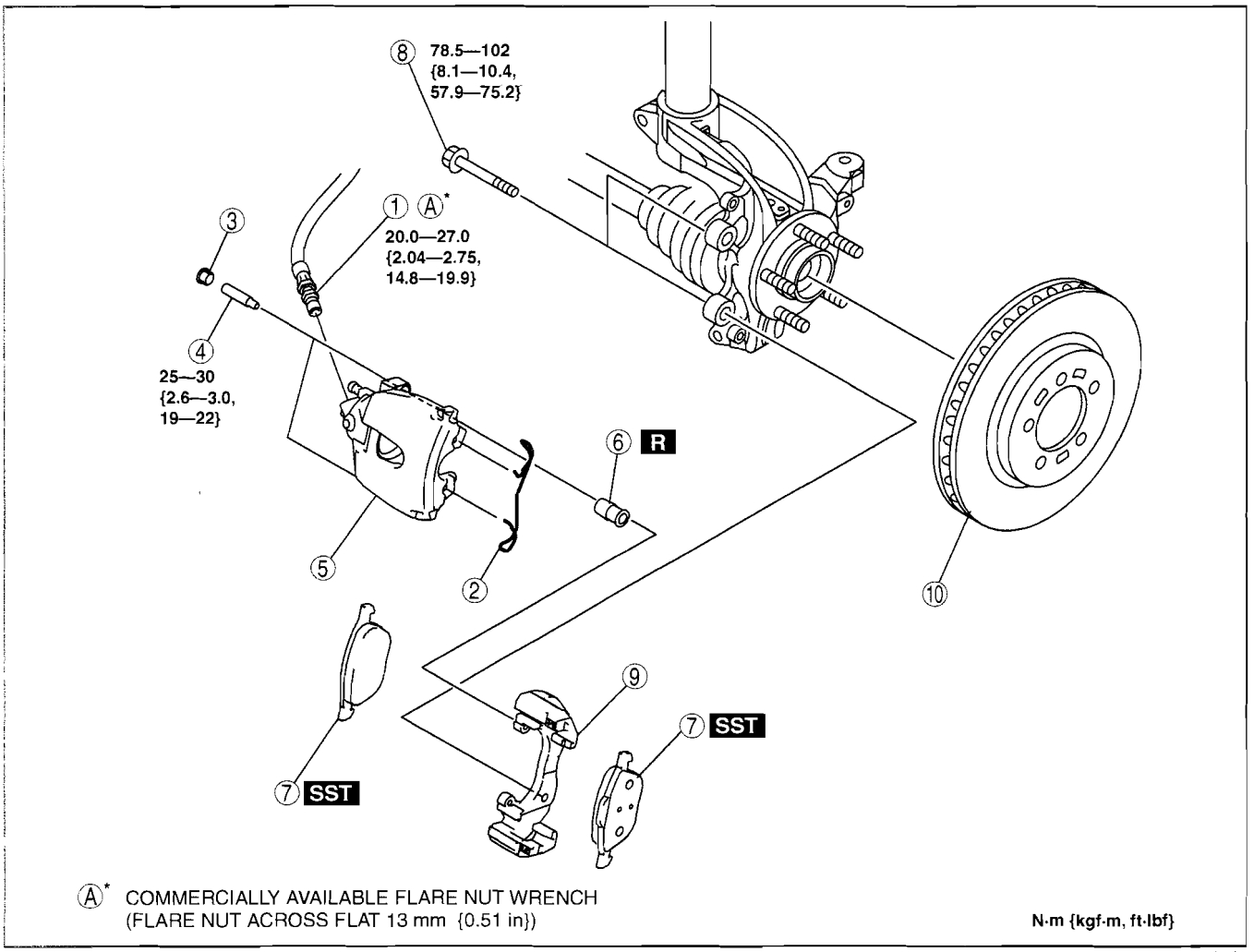


am3uuw0000037

FRONT BRAKE (DISC) REMOVAL/INSTALLATION[LF, L3]

id041100800938

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



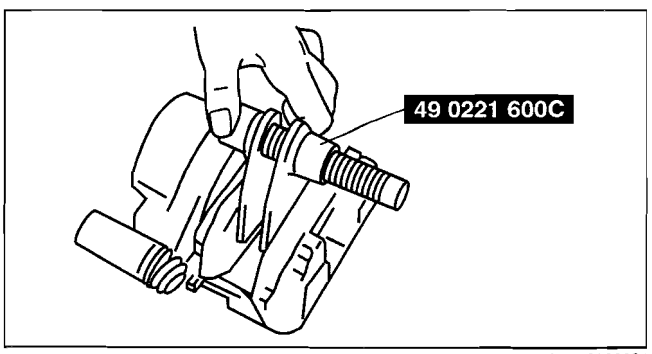
d3u411zwb101

1	Brake hose (See 04-11-19 Brake Hose Installation Note.)
2	Retaining clip
3	Cap
4	Bolt
5	Caliper

6	Boot
7	Disc pad (See 04-11-18 Disc Pad Installation Note.)
8	Bolt
9	Mounting support
10	Disc plate

Disc Pad Installation Note

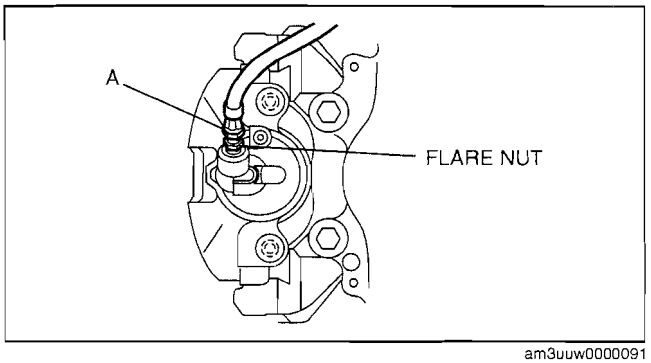
1. Clean the exposed area of the piston.
2. Push the piston in using the **SST**.
3. Install the disc pad (outer side) to the mounting support.
4. Install the disc pad (inner side) to the caliper.



am3uuw0000091

Brake Hose Installation Note

1. Install the brake hose to the caliper.
2. Tighten the flare nut while holding the brake hose at point A with a spanner or equivalent.
3. Verify that the brake hose is not twisted.

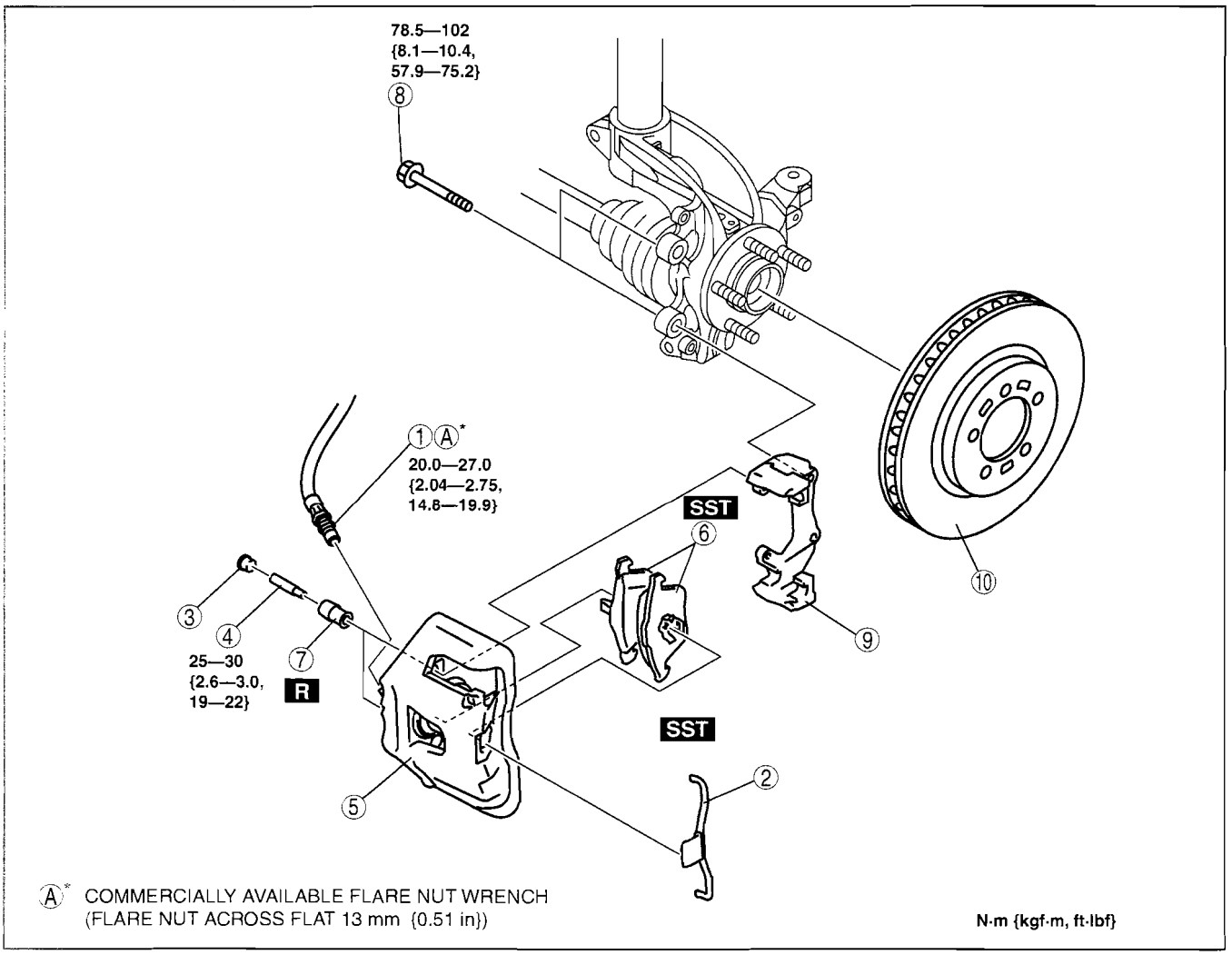


am3uuw0000091

FRONT BRAKE (DISC) REMOVAL/INSTALLATION[L3 WITH TC]

id041100800939

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



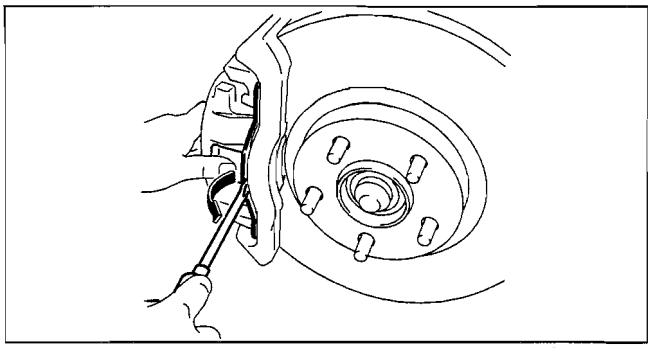
am3uuw0000037

1	Brake hose (See 04-11-20 Brake Hose Installation Note.)
2	Retaining clip (See 04-11-20 Retaining Clip Removal Note.)
3	Cap
4	Bolt
5	Caliper

6	Disc pad (See 04-11-20 Disc Pad Installation Note.)
7	Boot
8	Bolt
9	Mounting support
10	Disc plate

Retaining Clip Removal Note

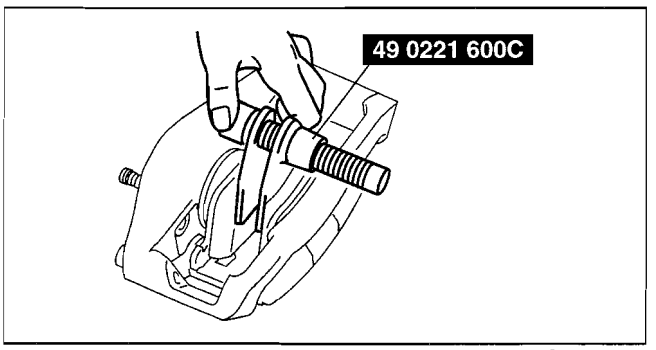
1. Move the retaining clip in the direction shown by the arrow using a flathead screwdriver and remove it from the caliper.



am3uuw0000037

Disc Pad Installation Note

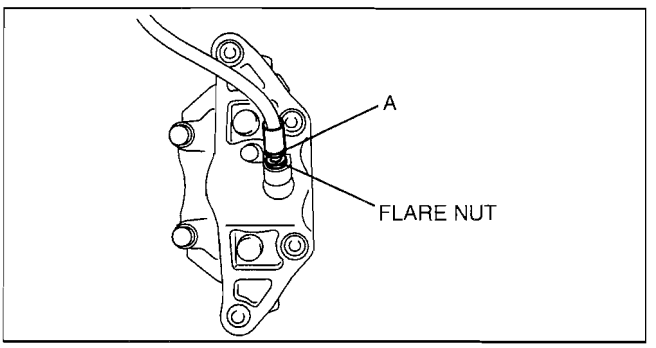
1. Clean the exposed area of the piston.
2. Push the piston in using the **SST**.
3. Install the disc pad to the caliper.



am3uuw0000037

Brake Hose Installation Note

1. Install the brake hose to the caliper.
2. Tighten the flare nut while holding the brake hose at point A with a spanner or equivalent.
3. Verify that the brake hose is not twisted.

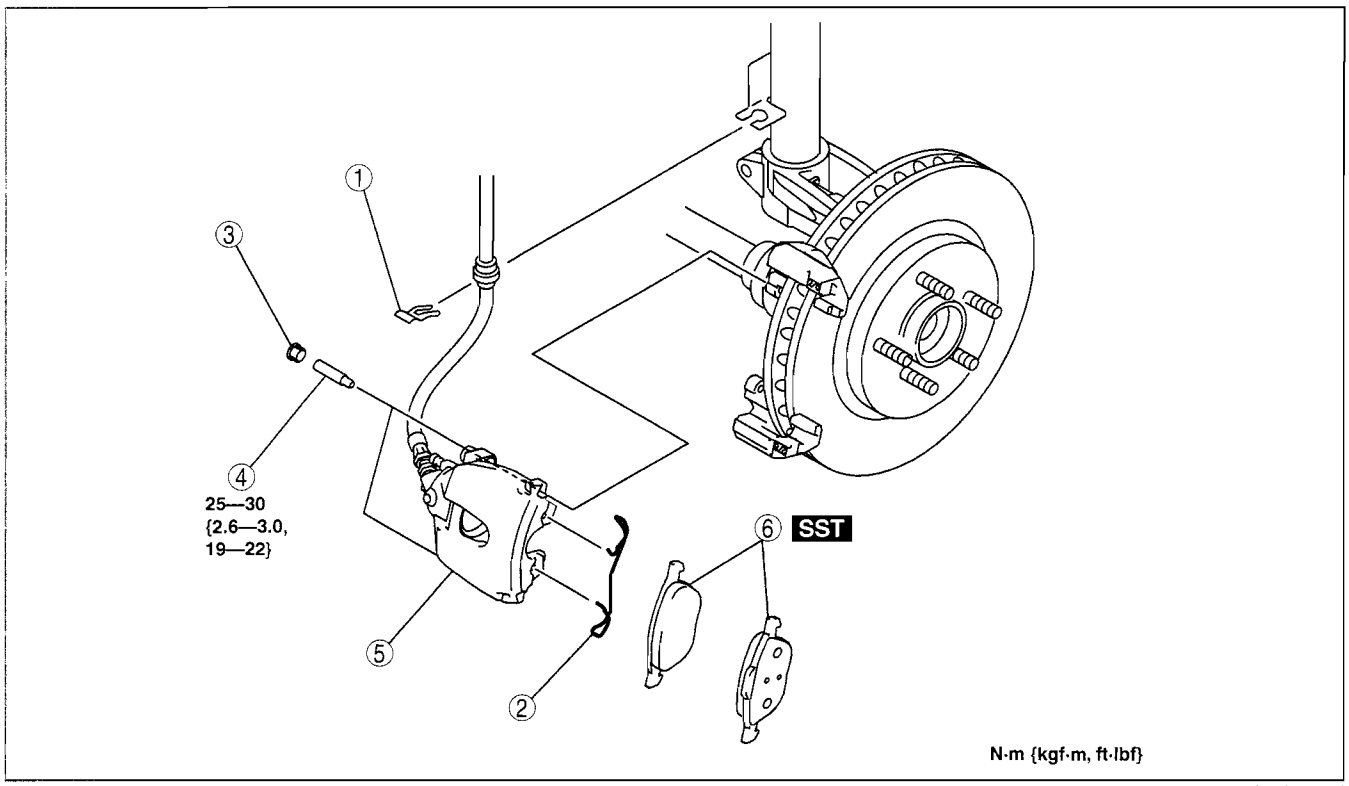


am3uuw0000037

DISC PAD (FRONT) REPLACEMENT[LF, L3]

id041100800738

1. Remove in the order indicated in the table.
2. install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



c3u0411w014

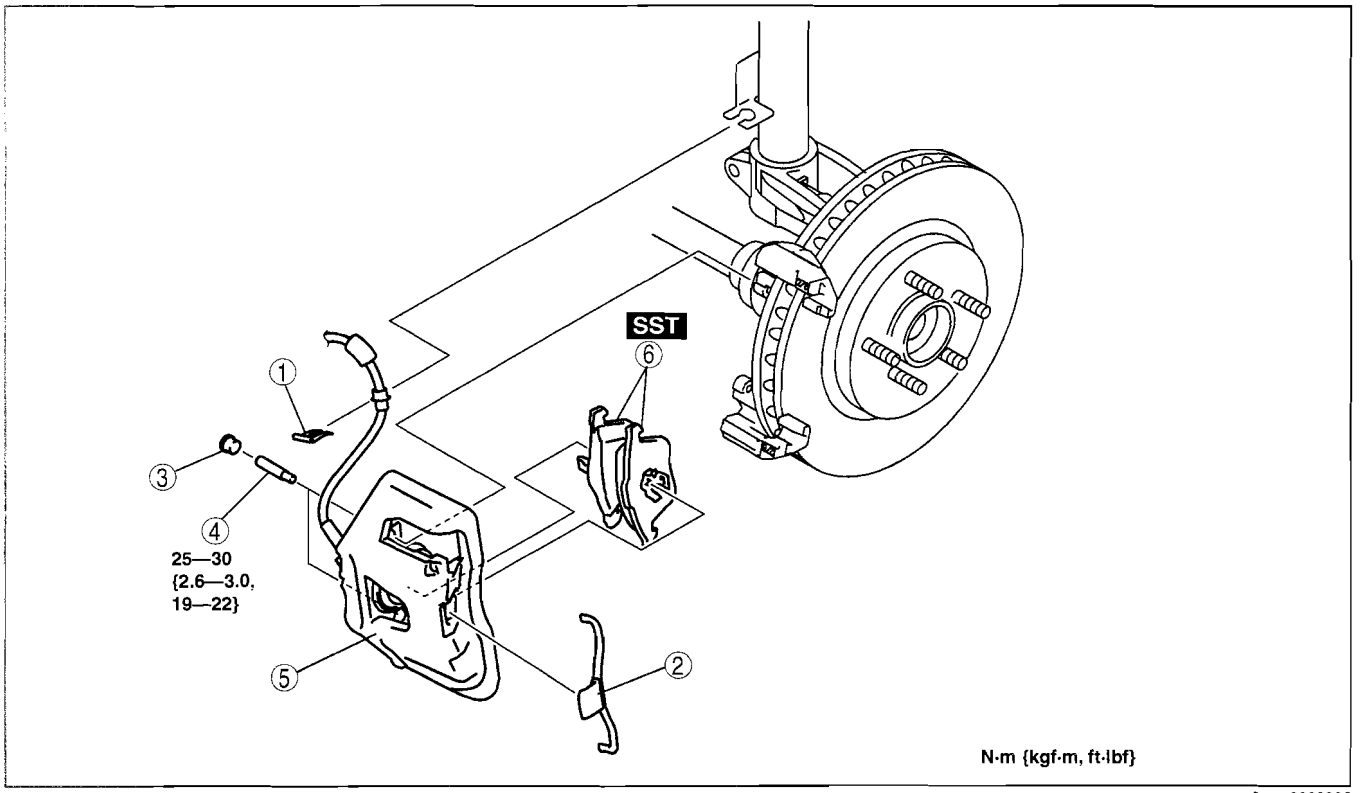
1	Clip
2	Retaining clip
3	Cap
4	Bolt

5	Caliper
6	Disc pad (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[LF, L3].)

DISC PAD (FRONT) REPLACEMENT[L3 WITH TC]

id041100800739

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and verify that the brakes do not drag.



am3uuw0000036

1	Clip
2	Retaining clip (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[L3 WITH TC].)
3	Cap

4	Bolt
5	Caliper
6	Disc pad (See 04-11-19 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION[L3 WITH TC].)

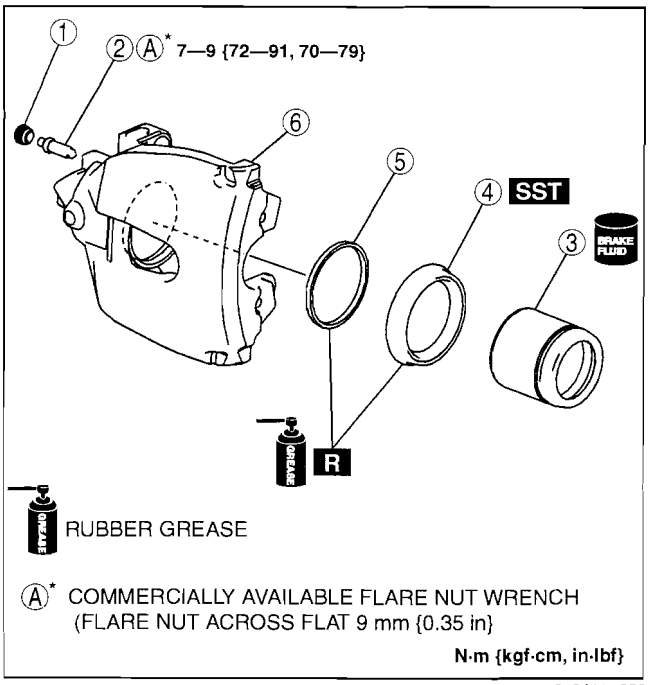
CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[LF, L3]

id041100801038

1. Disassemble in the order indicated in the table.

1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-23 Piston Disassembly Note.) (See 04-11-24 Piston Assembly Note.)
4	Dust seal (See 04-11-23 Dust Seal Assembly Note.)
5	Piston seal
6	Caliper body

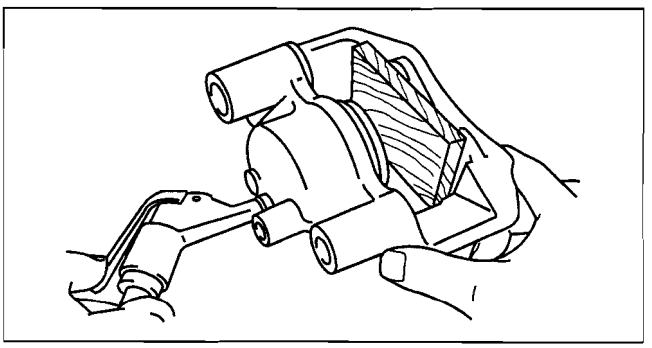
2. Assemble in the reverse order of disassembly.



c3u0411w052

Piston Disassembly Note

1. Insert a piece of wood in the caliper as shown in the figure and blow compressed air through the bleeder screw installation hole to remove the piston from the caliper body.



am3uuw0000037

Warning

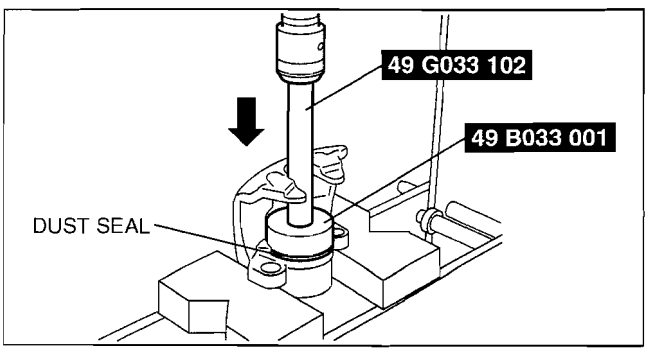
- **When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.**

Caution

- **The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.**

Dust Seal Assembly Note

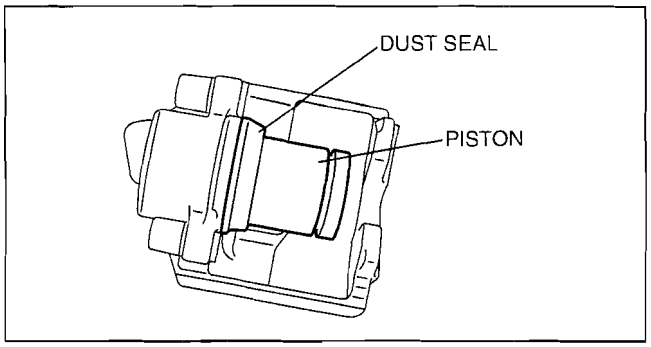
1. Assemble a new dust seal to the caliper using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**.
2. Verify that there is no gap between the dust seal and caliper body.



am3uuw0000037

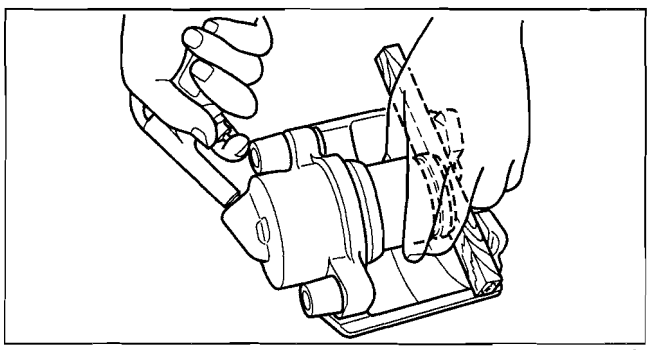
Piston Assembly Note

1. Press the piston into the dust seal opening as shown in the figure.



am3uuw0000037

2. Insert a piece of wood between the caliper body and the piston, and while supporting the piston by hand, blow compressed air through the brake hose installation hole.



am3uuw0000038

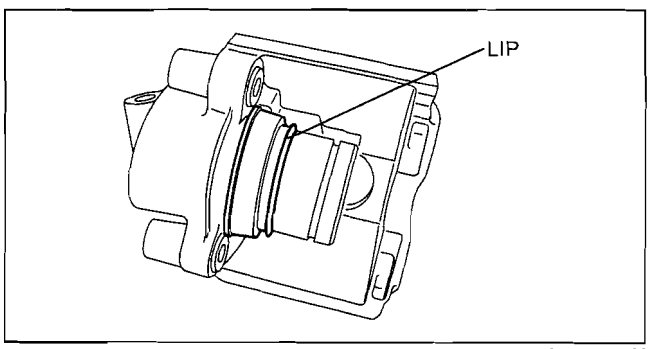
Warning

- **When blowing compressed air into the caliper body, the piston may pop out and cause injury if not supported at the correct point. Securely support the piston friction surface by hand when blowing compressed air.**

Note

- By blowing compressed air, the dust seal expands due to air pressure and covers the piston end.

3. Verify that the dust seal lip covers the piston end as shown in the figure.
4. Press the piston into the caliper body completely.



am3uuw0000038

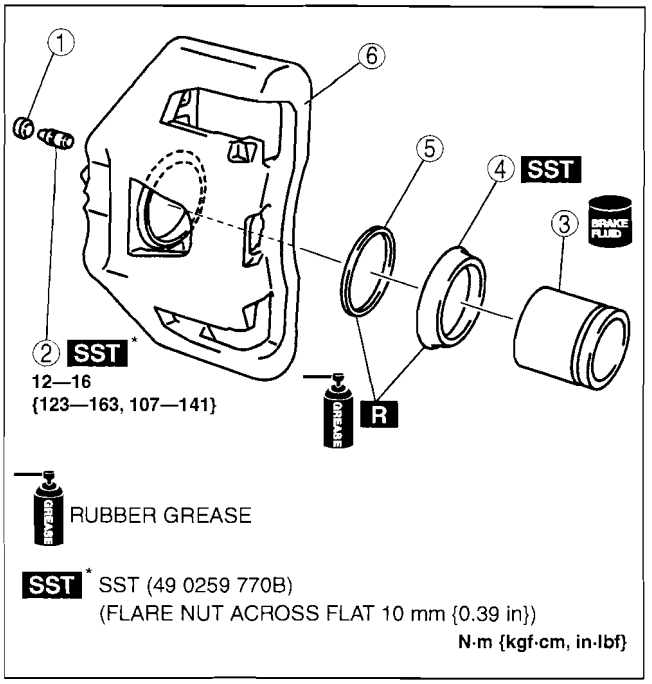
CALIPER (FRONT) DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id041100801039

1. Disassemble in the order indicated in the table.

1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-25 Piston Disassembly Note.) (See 04-11-26 Piston Assembly Note.)
4	Dust seal (See 04-11-25 Dust Seal Assembly Note.)
5	Piston seal
6	Caliper body

2. Assemble in the reverse order of disassembly.

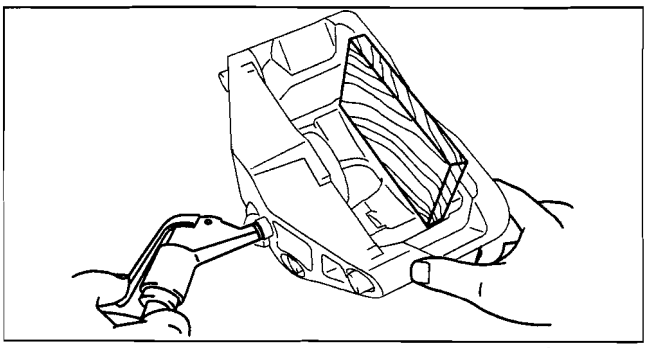


am3zzw0000347

04-11

Piston Disassembly Note

1. Insert a piece of wood in the caliper as shown in the figure and blow compressed air through the bleeder screw installation hole to remove the piston from the caliper body.



am3uuw0000038

Warning

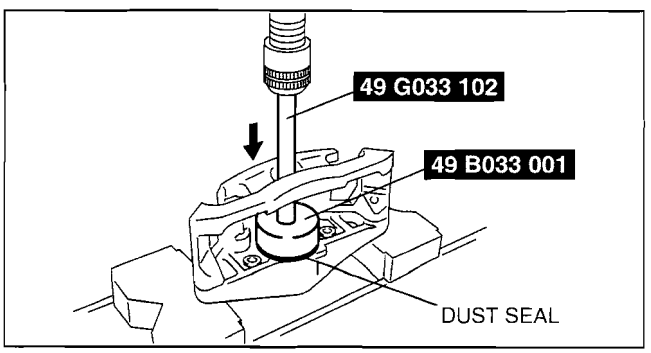
- **When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.**

Caution

- **The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.**

Dust Seal Assembly Note

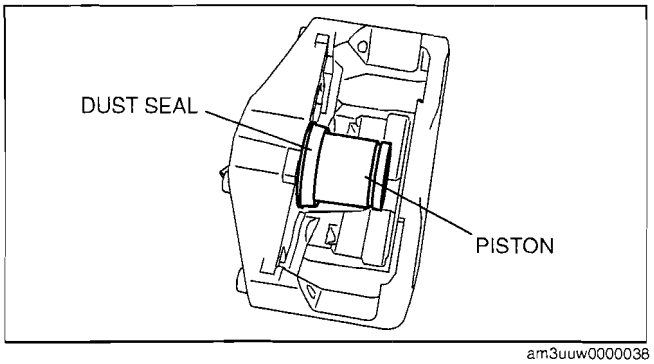
1. Assemble a new dust seal to the caliper using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**.
2. Verify that there is no gap between the dust seal and caliper body.



am3zzw0000347

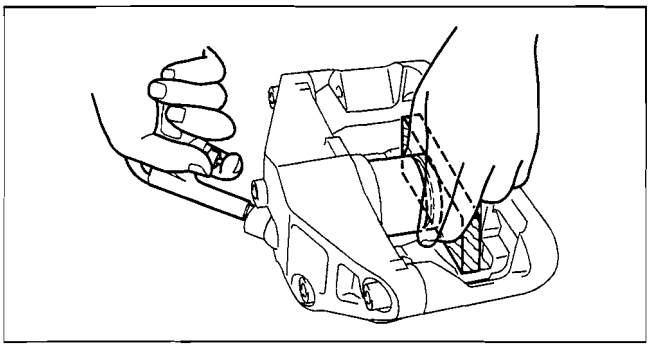
Piston Assembly Note

1. Press the piston into the dust seal opening as shown in the figure.



am3uuw0000038

2. Insert a piece of wood between the caliper body and the piston, and while supporting the piston by hand, blow compressed air through the brake hose installation hole.



am3uuw0000038

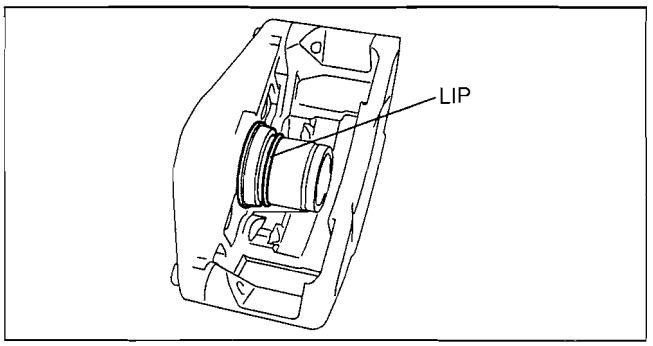
Warning

- **When blowing compressed air into the caliper body, the piston may pop out and cause injury if not supported at the correct point. Securely support the piston friction surface by hand when blowing compressed air.**

Note

- By blowing compressed air, the dust seal expands due to air pressure and covers the piston end.

3. Verify that the dust seal lip covers the piston end as shown in the figure.
4. Press the piston into the caliper body completely.



am3uuw0000038

REAR BRAKE (DISC) INSPECTION

id041100800400

Brake Judder Repair Hints

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. The steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

Brake pedal vibration

1. When applying the brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

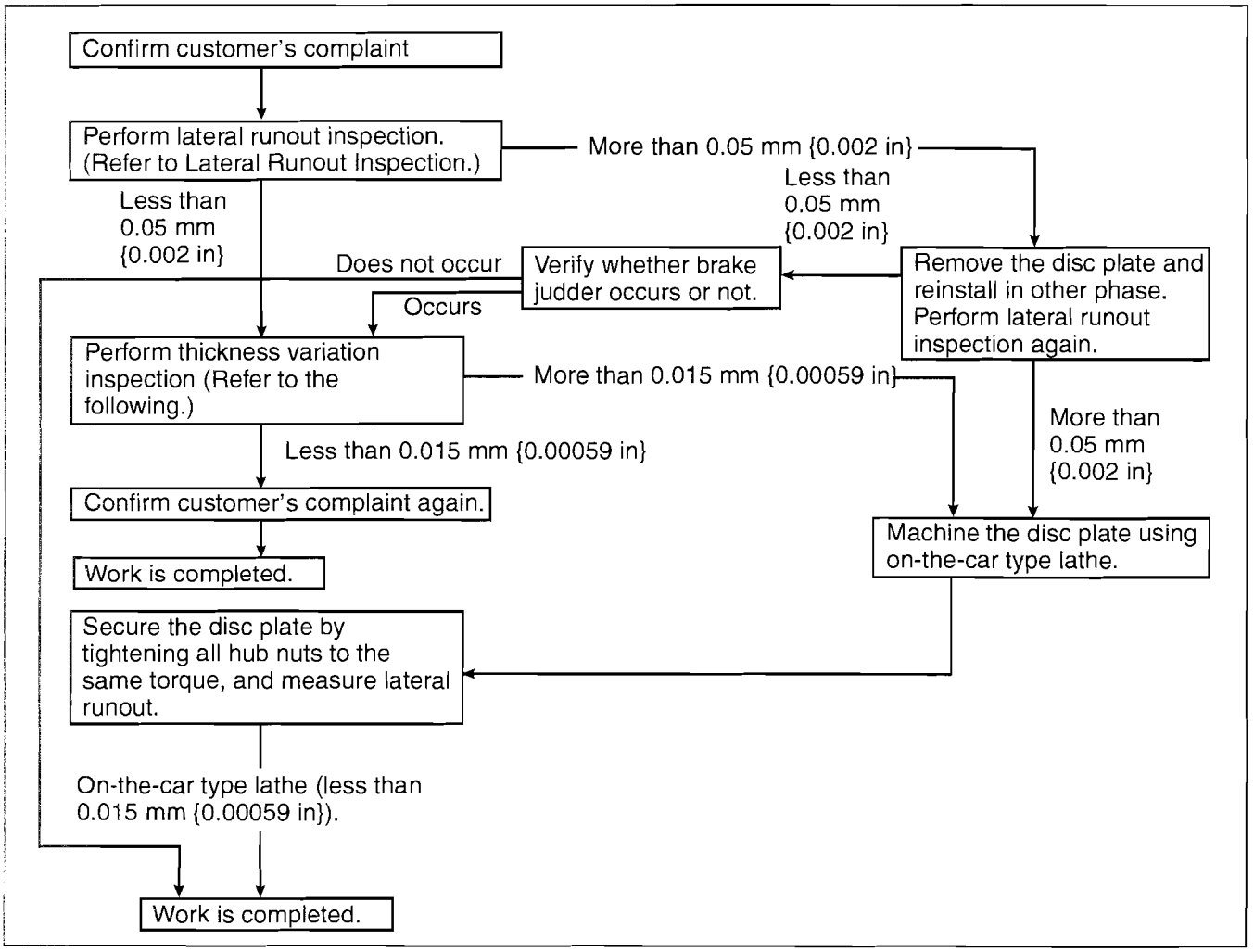
The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of the disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

Due to corrosion, the thickness and friction coefficient of the disc plate change.

1. If the vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of the disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



am3uuw0000074

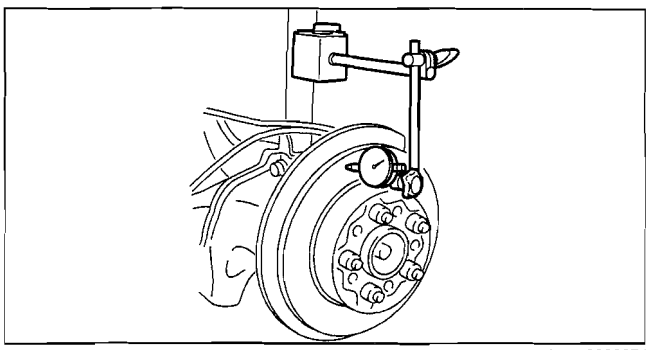
Lateral runout inspection

1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

Note
- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of the disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Rear disc plate runout limit
0.05 mm {0.002 in}

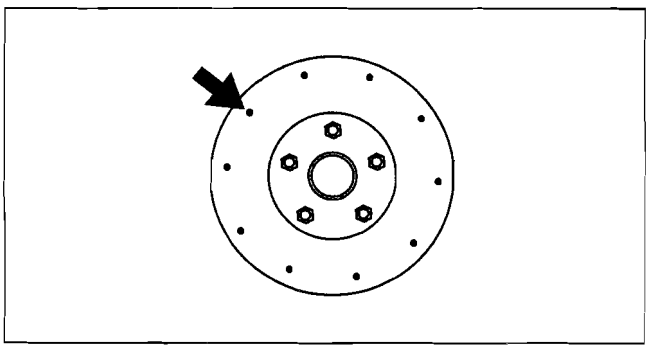

am3uuw0000074

Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within the specification, machine the disc plate using a lathe.

Thickness variation limit
0.015 mm {0.00059 in}

Warning
- **Do not exceed minimum disc plate thickness.**


am3uuw0000074

Disc Plate Thickness Inspection

Caution
- **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
   - If the thickness is not within the specification, replace the disc plate.

Minimum read disc plate thickness
9 mm {0.35 in}

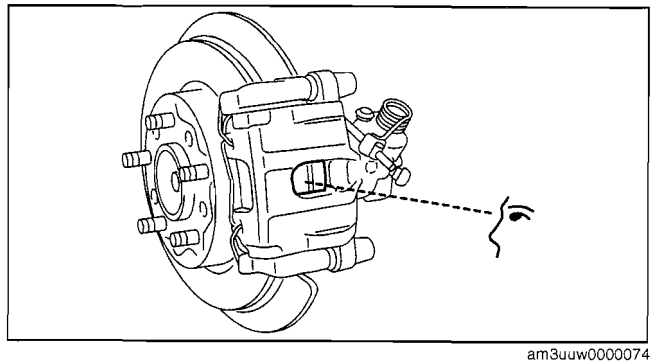
Minimum rear disc plate thickness after machining using a brake lathe on-vehicle
9.8 mm {0.39 in}

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Verify the remaining thickness of the pads.

Minimum rear disc pat thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.

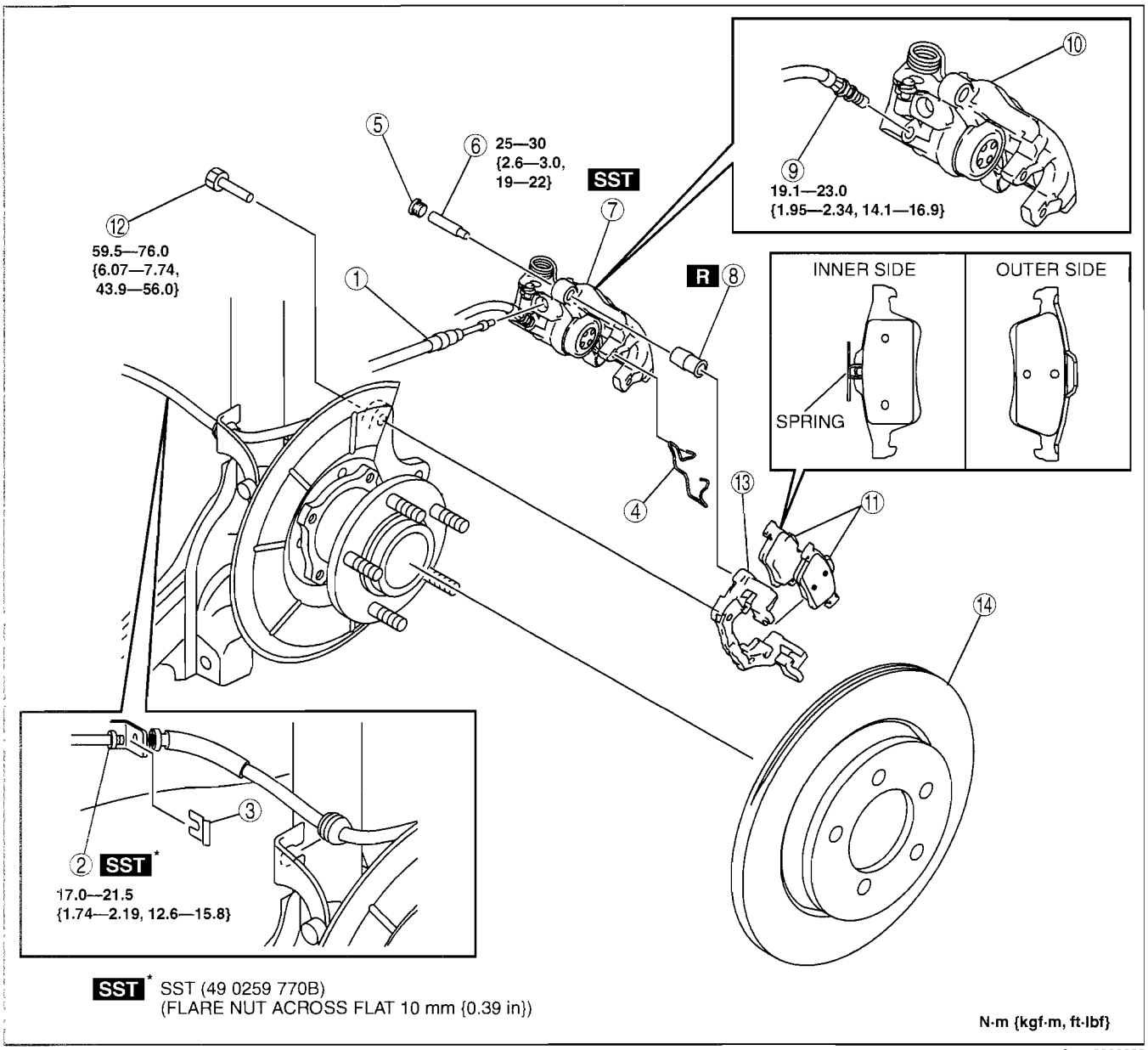


am3uuw0000074

REAR BRAKE (DISC) REMOVAL/INSTALLATION

id041100800500

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and inspect the following:
   — Parking brake lever stroke
   — Brake drag



am3zzw0000259

1	Parking brake cable
2	Brake pipe
3	Clip
4	Retaining clip
5	Cap
6	Bolt
7	Caliper, brake hose (See 04-11-31 Caliper, Brake Hose Installation Note.)

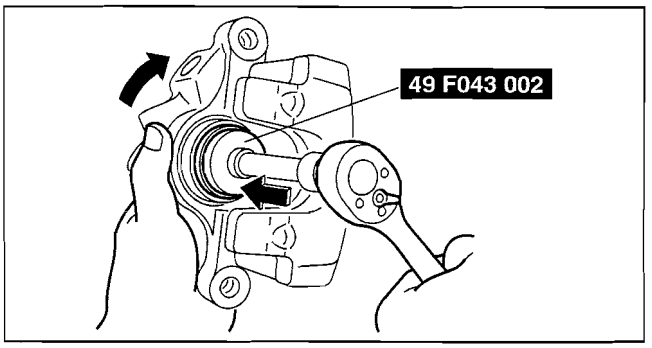
8	Boot
9	Brake hose
10	Caliper
11	Disc pad
12	Bolt
13	Mounting support
14	Disc plate

Caliper, Brake Hose Installation Note

1. Clean the exposed area of the piston.
2. Slowly rotate the piston clockwise while firmly pushing it to the caliper body using the **SST** and push the piston completely into the caliper body.

Warning

- **If the SST comes off the piston, it may cause other parts to crush against your hand causing injury. Be careful that the SST remains firmly connected to the piston when you push the piston into the caliper body.**



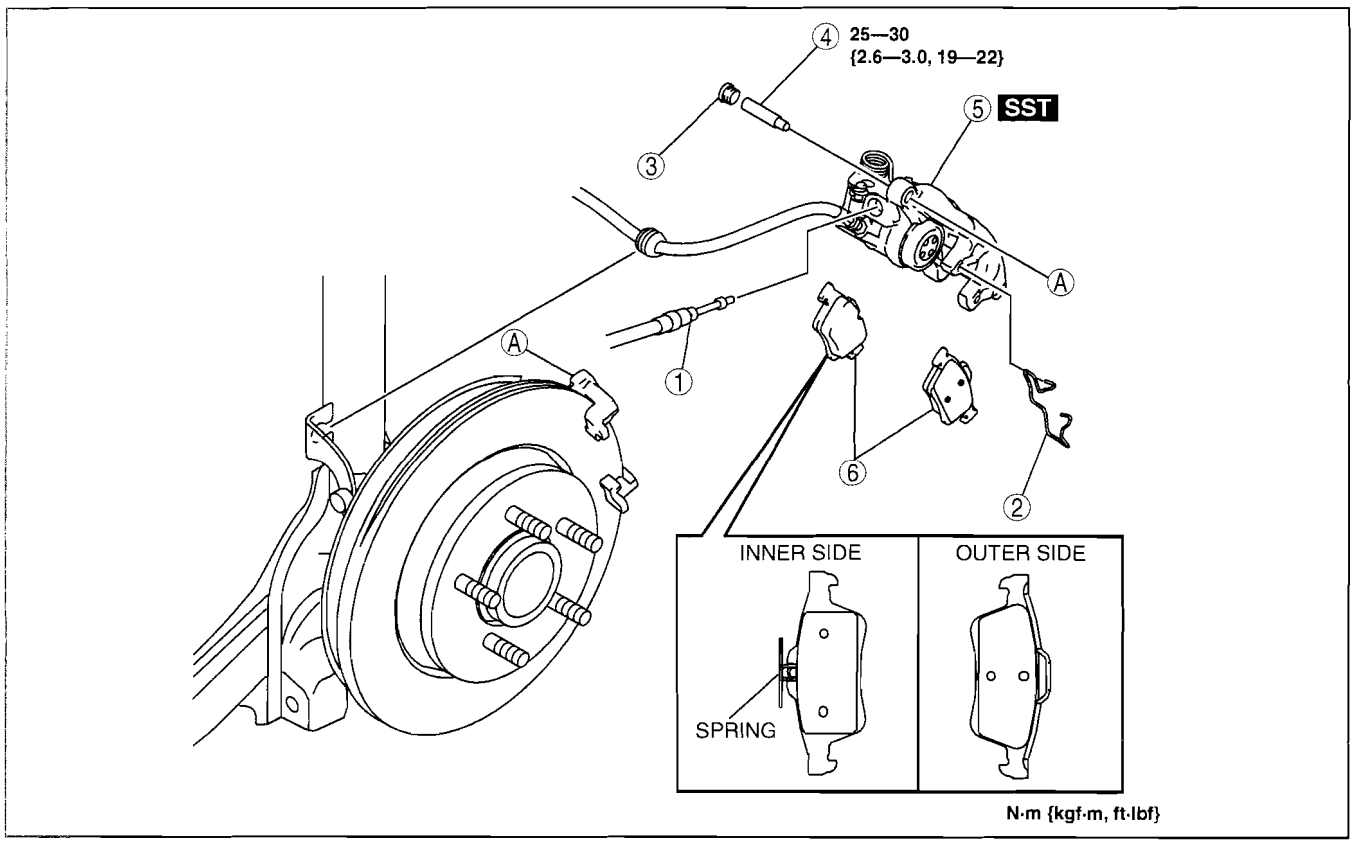
am3uuw0000088

3. Install the the caliper, brake hose.

DISC PAD (REAR) REPLACEMENT

id041100800300

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, pump the brake pedal a few times and inspect the following:
   — Parking brake lever stroke
   — Brake drag



am3zzw0000259

1	Parking brake cable
2	Retaining clip
3	Cap
4	Bolt

5	Caliper (See 04-11-30 REAR BRAKE (DISC) REMOVAL/ INSTALLATION.)
6	Disc pad

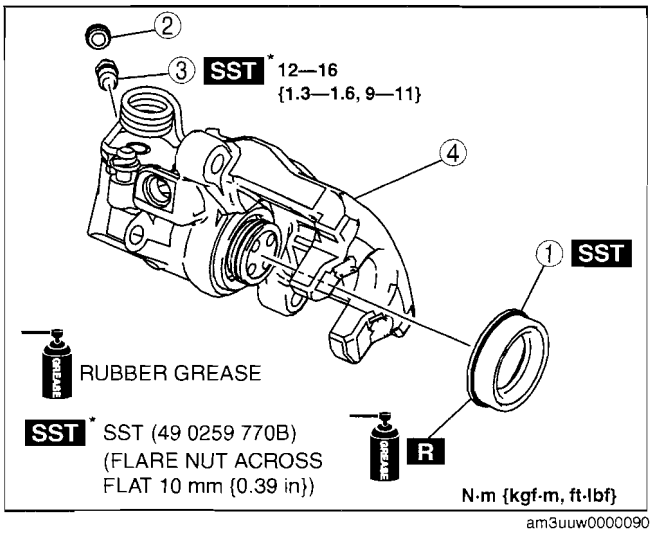
CALIPER (REAR) DISASSEMBLY/ASSEMBLY

id041100800600

1. Disassemble in the order indicated in the table.

1	Dust seal (See 04-11-32 Dust Seal Assembly Note.)
2	Bleeder cap
3	Bleeder screw
4	Caliper body

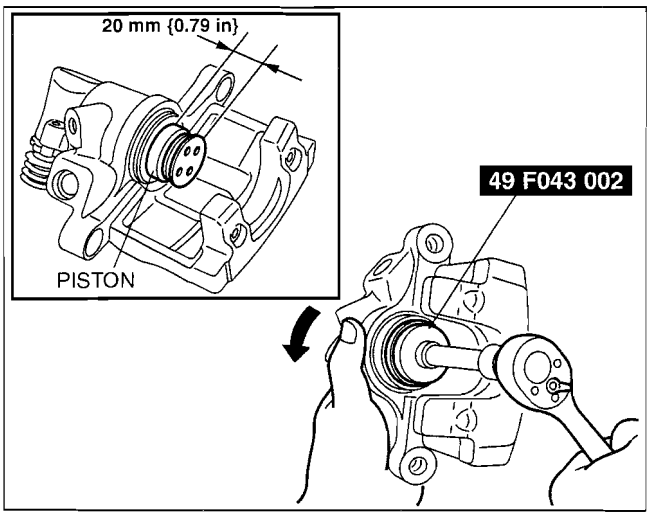
2. Assemble in the reverse order of disassembly.



am3uuw0000090

Dust Seal Assembly Note

1. While rotating the piston counterclockwise using the **SST**, pull it out to the position shown in the figure.

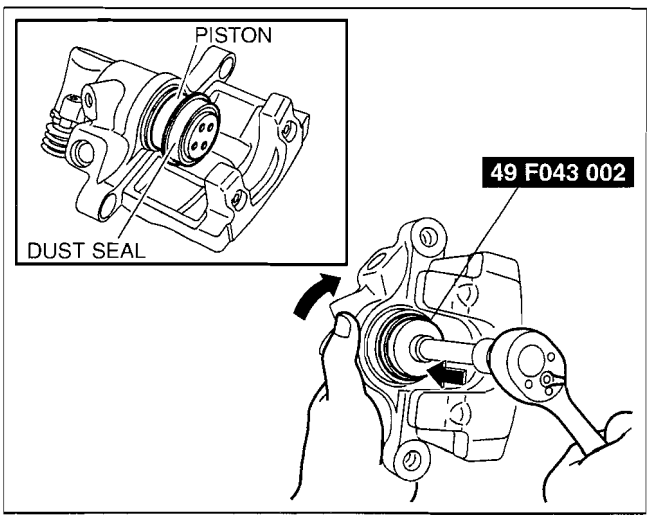


am3uuw0000091

2. As shown in the figure, assemble a new dust seal to the piston and slowly rotate the piston clockwise while pushing it to the caliper body using SST to push the piston completely into the caliper body.

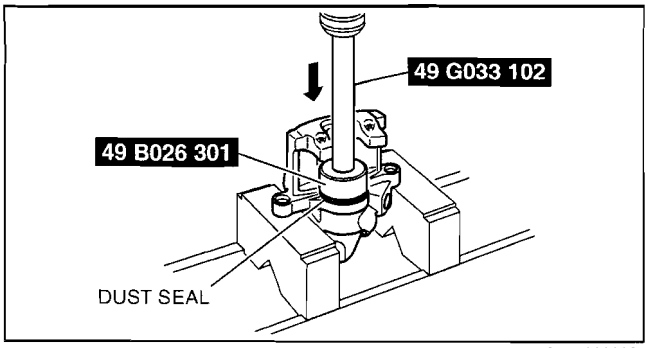
Warning

- **If the SST comes off the piston, it may cause other parts to crush against your hand causing injury. Be careful that the SST remains firmly connected to the piston when you push the piston into the caliper body.**



am3uuw0000091

3. Assemble the dust seal to the caliper body using the **SSTs** and a press with a press-in force of **834 N {85 kgf, 187 in·lbf}**
4. Verify that there is no gap between the dust seal and caliper body.

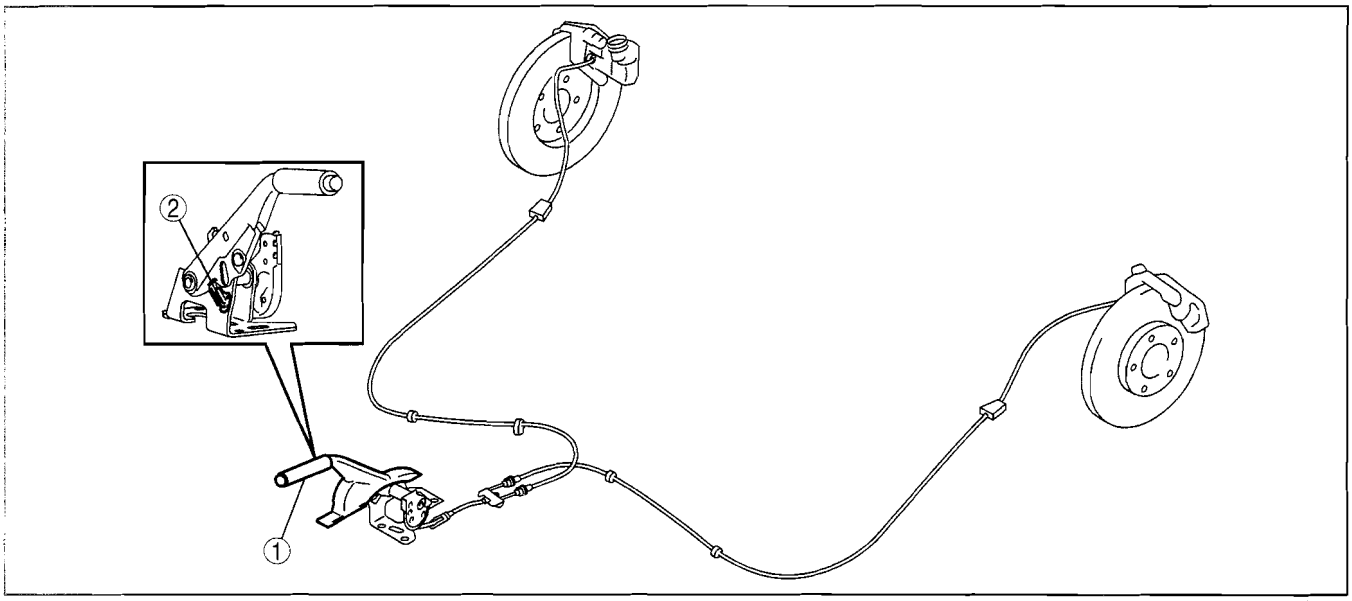


am3uuw0000091

04-12 PARKING BRAKE SYSTEM

PARKING BRAKE SYSTEM LOCATION INDEX

id041200800100



C3U0412W002

1	Parking brake lever (See 04-12-2 PARKING BRAKE LEVER INSPECTION.) (See 04-12-2 PARKING BRAKE LEVER ADJUSTMENT.) (See 04-12-2 PARKING BRAKE LEVER REMOVAL/INSTALLATION.)
2	Parking brake switch (See 04-12-4 PARKING BRAKE SWITCH INSPECTION.)

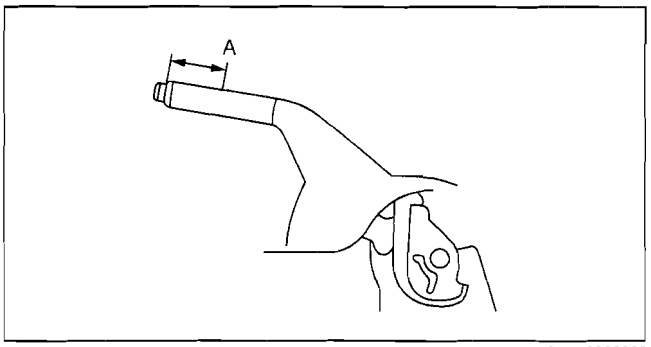
PARKING BRAKE LEVER INSPECTION

id041200800900

Stroke Inspection

1. Pump the brake pedal a few times.
2. Pull the parking brake lever two to three times.
3. Inspect the parking brake stroke by slowly pulling at point A **50 mm {1.97 in}** from the end of the parking brake lever with a force of **98 N {10 kgf, 22 lbf}** and counting the number of notches (clicking sound).
   - If not within the specification, adjust the parking brake lever.

Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}
3—7 notches

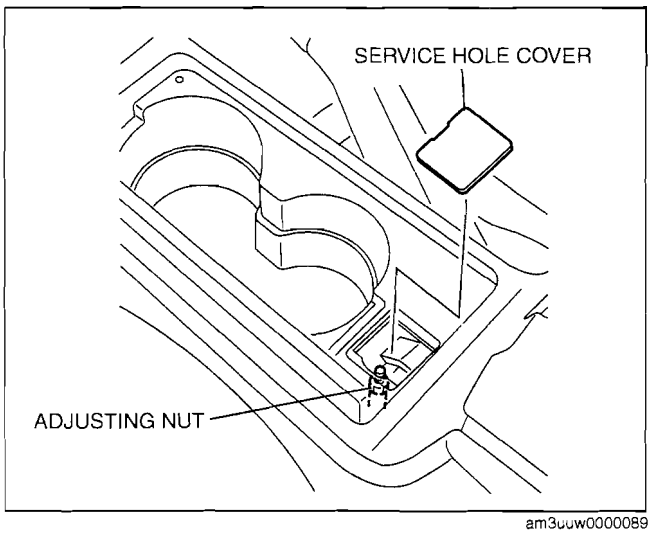


am3uuw0000028

PARKING BRAKE LEVER ADJUSTMENT

id041200801500

1. Pump the brake pedal a few times.
2. Remove the service hole cover of the rear console.
3. Turn the adjusting nut and adjust the parking brake lever.
4. After adjustment, pull the parking brake lever one notch and verify that the parking brake warning light illuminates.
5. Verify that the rear brakes do not drag.



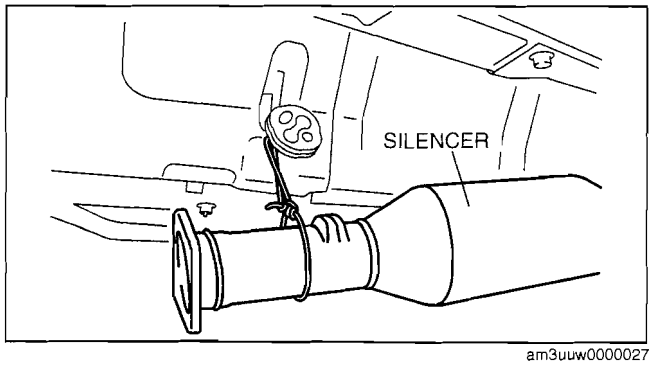
am3uuw0000089

PARKING BRAKE LEVER REMOVAL/INSTALLATION

id041200801600

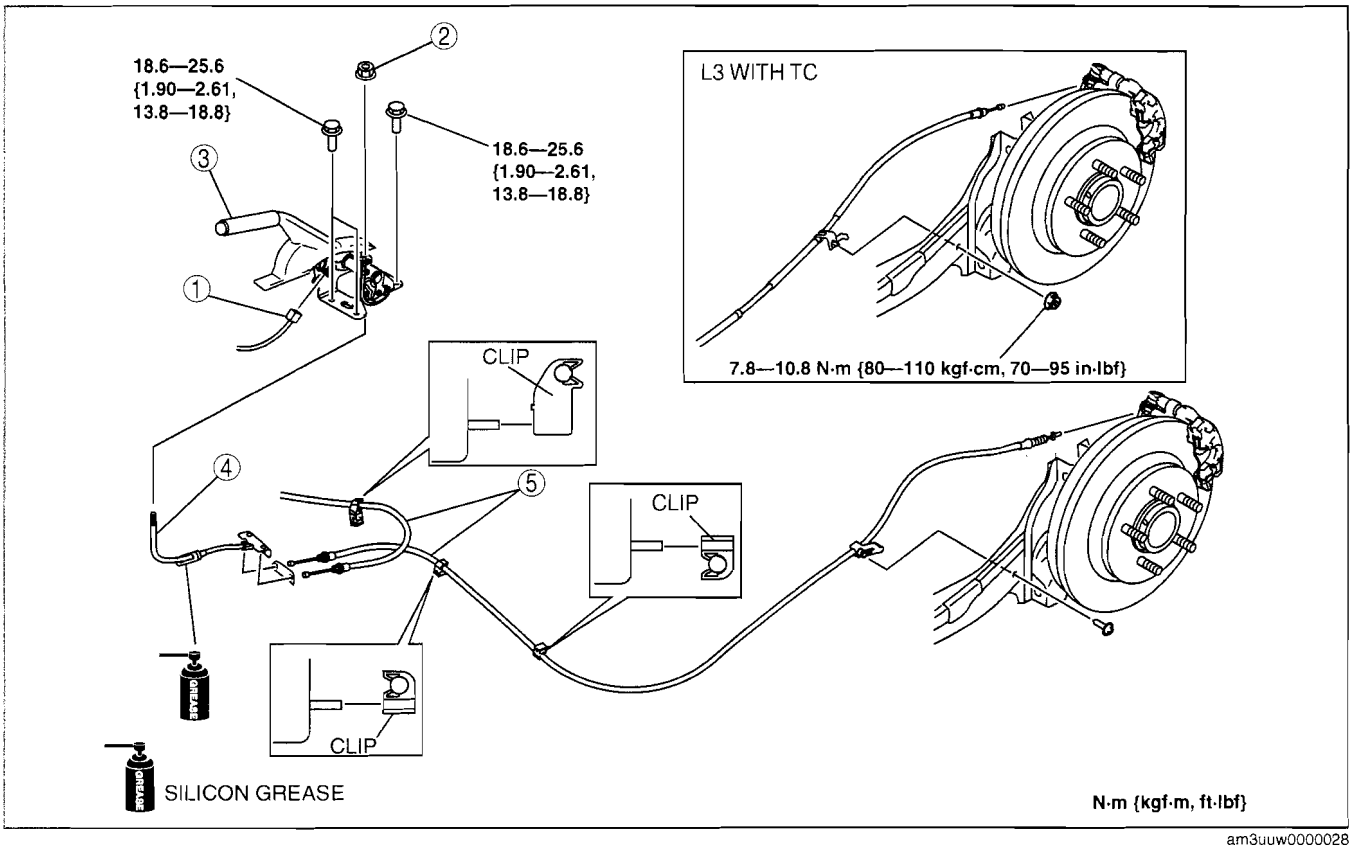
1. To remove the front and rear parking brake cables, perform the following and remove the heat insulator.
   LF, L3
   1. Remove the main silencer. (See 01-15A-1 EXHAUST SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   2. Remove the heat insulator.

   L3 WITH TC
   1. Remove the member. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   2. Remove the silencer installation nuts. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   3. Disconnect the hanger rubber except for the one installed to the rear end of the vehicle from the silencer, and suspend the silencer using rope.
   4. Remove the heat insulator.
2. To remove the parking brake lever and front parking brake cable, remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



am3uuw0000027

5. After installation, inspect the parking brake lever stroke. (See 04-12-2 PARKING BRAKE LEVER INSPECTION.)

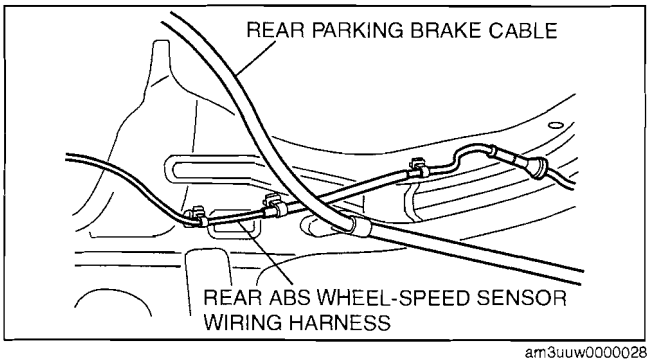


am3uuw0000028

1	Parking brake switch connector
2	Adjusting nut
3	Parking brake lever
4	Front parking brake cable (See 04-12-4 Front Parking Brake Cable Installation Note.)
5	Rear parking brake cable (See 04-12-3 Rear Parking Brake Cable Installation Note.)

Rear Parking Brake Cable Installation Note

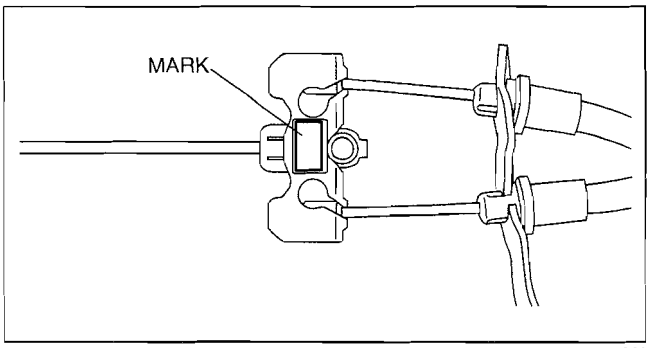
1. Pass the rear parking brake cable inside the rear ABS wheel-speed sensor wiring harness as shown in the figure.
2. Install the rear parking brake cable.



am3uuw0000028

Front Parking Brake Cable Installation Note

1. Install the front parking brake cable with the mark on the equalizer facing toward the vehicle downside.

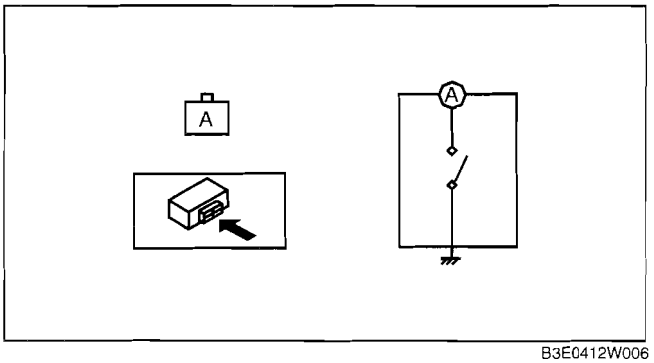


am3uuw0000028

PARKING BRAKE SWITCH INSPECTION

id041200800700

1. Disconnect the parking brake switch connector.
2. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the parking brake lever.



B3E0412W006

O—O: Continuity

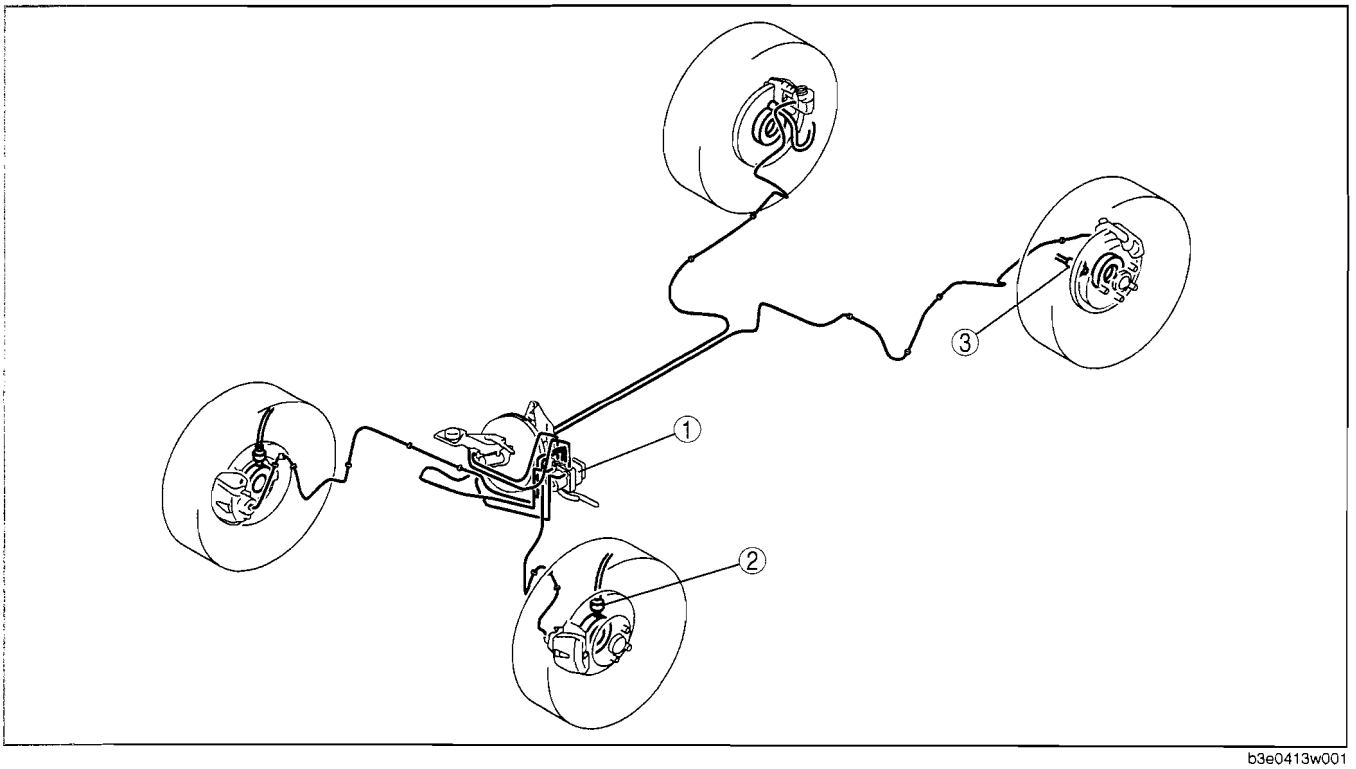
Condition	Terminal	
	A	Body ground
Parking brake lever pulled	O	O
Parking brake lever released		

CHU0412W003

04-13 ANTILOCK BRAKE SYSTEM

ABS LOCATION INDEX

id041300801100



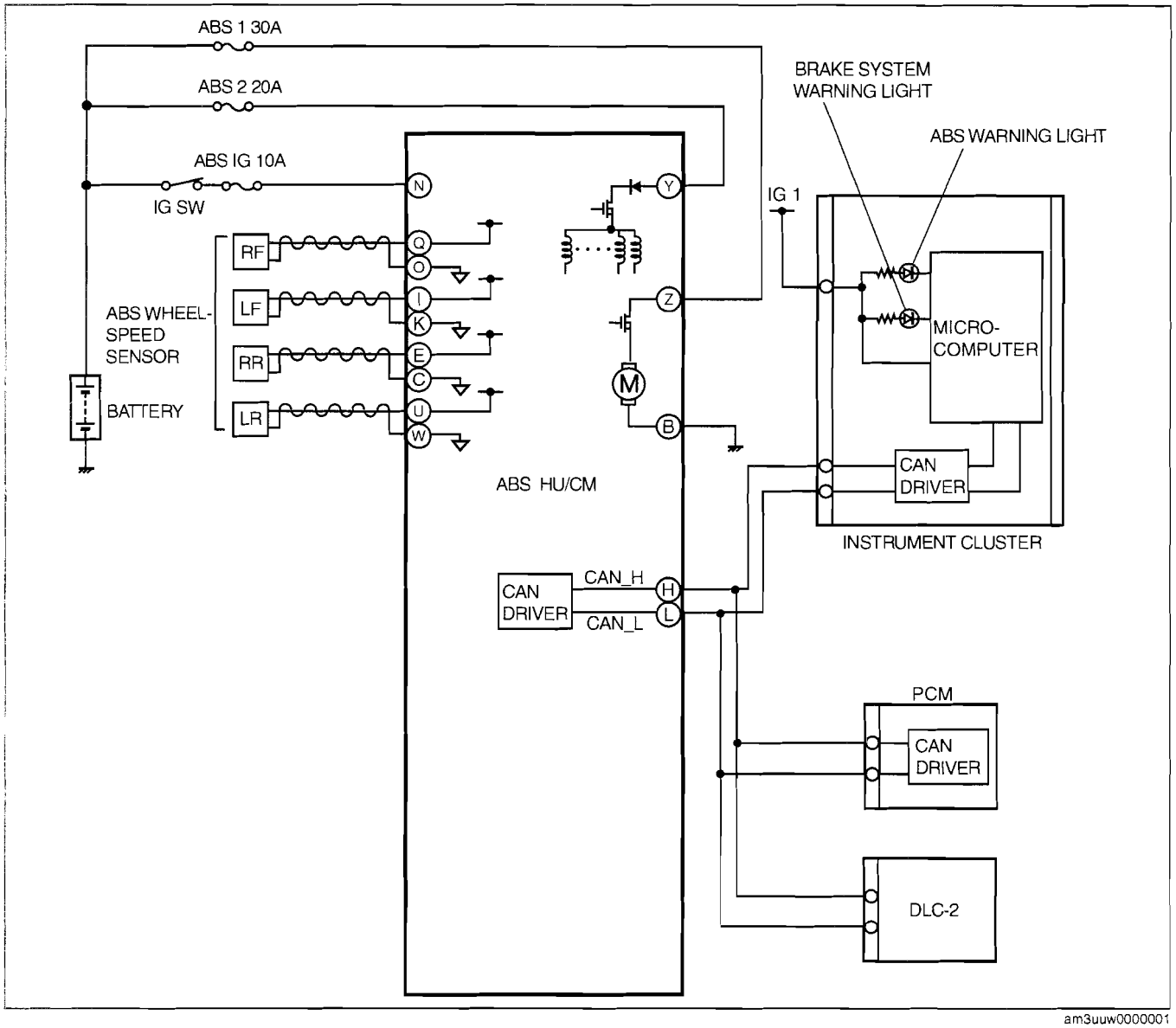
b3e0413w001

1	ABS HU/CM (See 04-13-2 ABS SYSTEM INSPECTION.) (See 04-13-4 ABS HU/CM REMOVAL/INSTALLATION.) (See 04-13-6 ABS CONFIGURATION.) (See 04-13-6 ABS HU/CM INSPECTION.)

2	Front ABS wheel-speed sensor (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)
3	Rear ABS wheel-speed sensor (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)

ABS SYSTEM WIRING DIAGRAM

id041300805000



am3uuw0000001

ABS SYSTEM INSPECTION

id041300800200

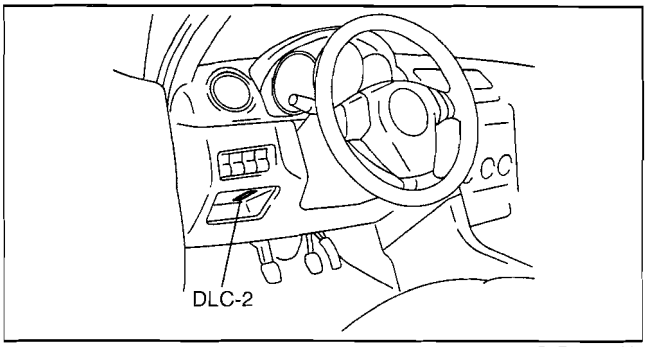
ABS Hydraulic Unit On-vehicle Inspection

Preparation

1. Verify that the battery is fully charged.
2. Turn the ignition switch to the ON position and verify that the ABS warning light goes out after **approx. 3.0 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to neutral.
6. Release the parking brake.
7. Verify that all four wheels rotate.
8. Rotate the inspected wheels by hand and verify there is no brake drag.
   - If there is any brake drag, perform regular brake inspection.
   - If there is no brake drag, perform ABS HU/CM operation inspection.

Operation inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below.



B3E0102W003

Operation condition	Command name			Command transmission type
	PMP_MOTOR	RF_OUTLET	RF_INLET	
Brake pressure retention	OFF	OFF	ON	Manual
Brake pressure reduction	ON	ON	ON	

The chart above shows an example of a right front wheel inspection.

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the ABS HU/CM.**

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.
5. Performing the inspection above determines the following:
   - The ABS HU/CM brake lines are normal.
   - The ABS HU/CM hydraulic system is not significantly abnormal (including inside ABS HU/CM).
   - The ABS HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
   - The ABS HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
     - — However, the following items cannot be verified.
       - Malfunction of ABS HU/CM input system wiring harnesses and parts
       - Extremely small leakage in the ABS HU/CM internal hydraulic system
       - Intermittent malfunction of the above items

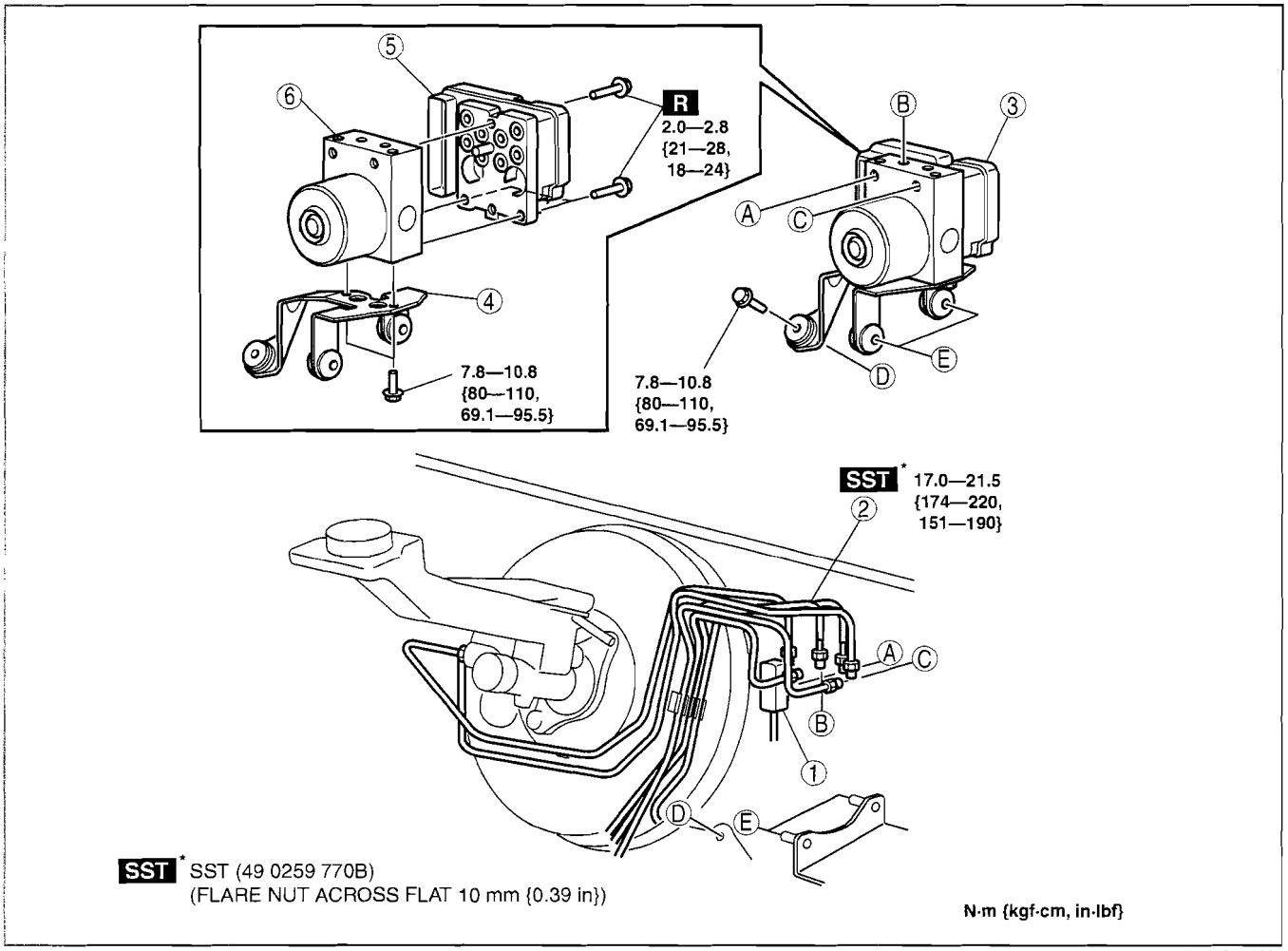
ABS HU/CM REMOVAL/INSTALLATION

id041300801400

Caution

- **When replacing the ABS HU/CM, the configuration procedure must be done before removing the ABS HU/CM. If the configuration is not completed before removing the ABS HU/CM, ABS will not work properly after installation of the ABS HU/CM.**
- **Do not separate the ABS HU and ABS CM unless replacing them, otherwise the ABS HU/CM may not function properly. When replacing them with new ones, always perform procedures according to the instructions included with the new parts.**
- **The internal parts of the ABS HU/CM could be damaged if dropped. Be careful not to drop the ABS HU/CM. Replace the ABS HU/CM if it is subjected to an impact.**

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the reserve hose. (MTX) (See 04-11-9 MASTER CYLINDER REMOVAL/INSTALLATION[LF, L3].) (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Configurate the ABS HU/CM (only when replacing it). (See 04-13-6 ABS CONFIGURATION.)



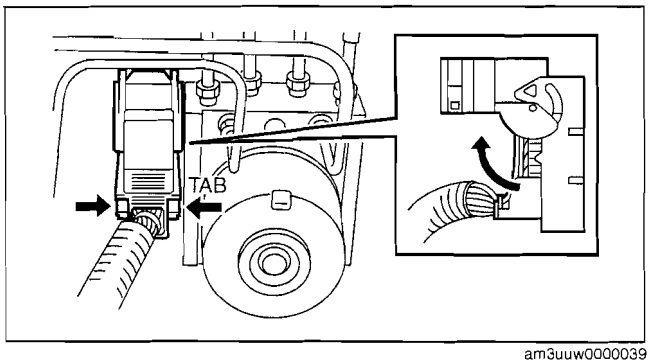
d3u413zw6001

1	Connector (See 04-13-5 Connector Removal Note.) (See 04-13-6 Connector Installation Note.)
2	Brake pipe (See 04-13-5 Brake Pipe Removal Note.) (See 04-13-5 Brake Pipe Installation Note.)

3	ABS HU/CM component, bracket (See 04-13-5 ABS HU/CM Component, Bracket Removal Note.)
4	Bracket
5	ABS CM
6	ABS HU

Connector Removal Note

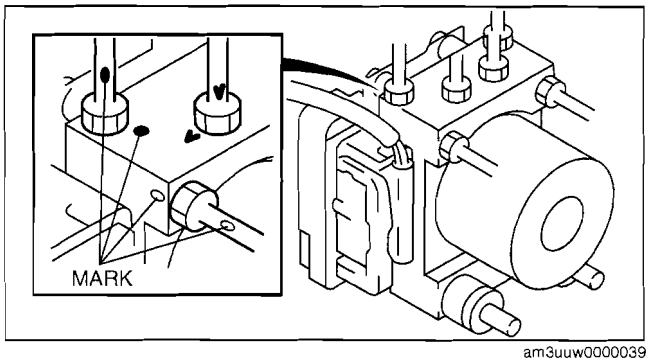
1. Pull the connector cover up in the direction of the arrow while pressing the tab of the connector cover.
2. Pull the connector toward the vehicle front and remove it.



am3uuw0000039

Brake Pipe Removal Note

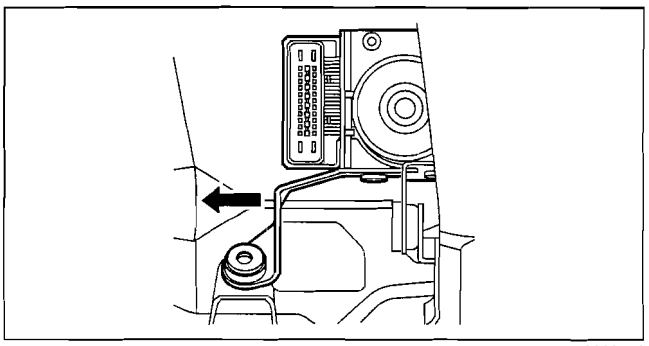
1. Place an alignment mark on the brake pipe and ABS HU/CM.
2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.



am3uuw0000039

ABS HU/CM Component, Bracket Removal Note

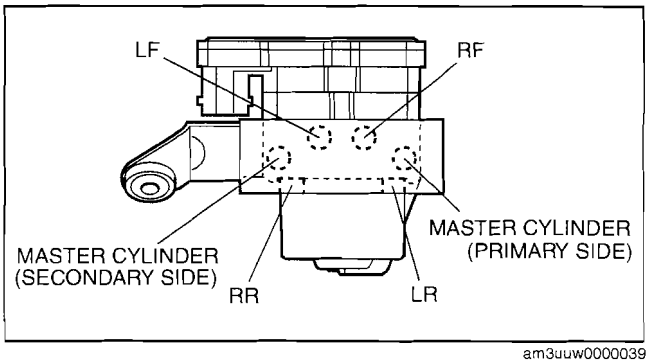
1. As shown in the figure, move the bracket in the direction of the arrow and remove the ABS HU/CM component and bracket from the body.



am3uuw0000039

Brake Pipe Installation Note

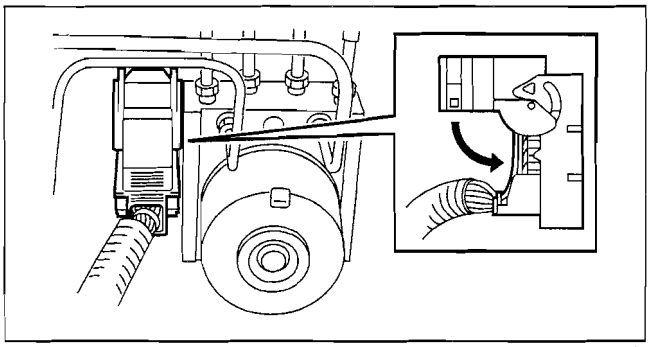
1. Align the marks made before removal and install the brake pipe to the ABS HU/CM referring to the figure.



am3uuw0000039

Connector Installation Note

1. After connecting the connector, verify that the connector cover is completely pushed in.

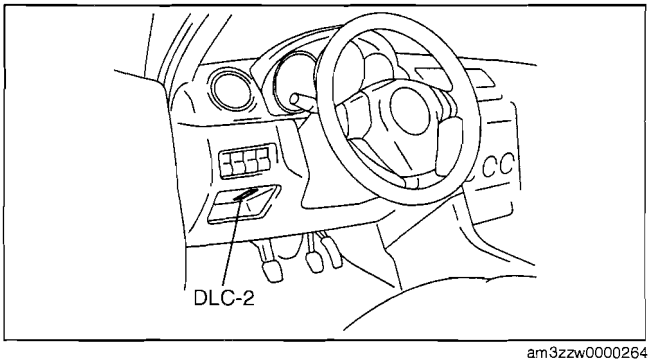


am3uuw0000039

ABS CONFIGURATION

id041300802000

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module Programming".
3. Then, select the "Programmable Module Installation" and "ABS" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection. (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].)



am3zzw0000264

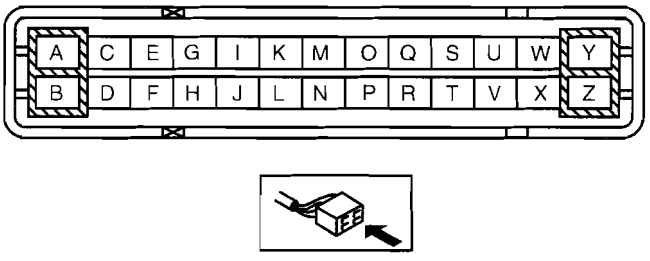
ABS HU/CM INSPECTION

id041300801000

1. Disconnect the ABS HU/CM connector.
2. Connect the negative battery cable.
3. Attach the tester lead to the ABS HU/CM wiring harness-side connector, then inspect the voltage, continuity, or resistance according to the standard (reference) on the table.

Terminal Voltage Table (Reference)

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



B3E0413W010

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
A	—	—	—	—	—	—
B	Ground (ABS motor)	Ground point	Continuity	B—ground point	Continuity detected	• Wiring harness (B—ground point)
C	RR wheel-speed (ground)	RR ABS wheel-speed sensor	Continuity	C—RR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (C—RR ABS wheel-speed sensor terminal B)
D	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
E	RR wheel-speed (signal)	RR ABS wheel-speed sensor	Continuity	E—RR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (E—RR ABS wheel-speed sensor terminal A)
F	—	—	—	—	—	—
G	—	—	—	—	—	—
H	CAN_H	Data link connector-2 (CAN_H)	Continuity	H—DLC-2 terminal CAN_H	Continuity detected	• Wiring harness (H—DLC-2 terminal CAN_H)
I	LF wheel-speed (signal)	LF ABS wheel-speed sensor	Continuity	I—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (I—LF ABS wheel-speed sensor terminal A)
J	—	—	—	—	—	—
K	LF wheel-speed (ground)	LF ABS wheel-speed sensor	Continuity	K—LF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (K—LF ABS wheel-speed sensor terminal B)
L	CAN_L	Data link connector-2 (CAN_L)	Continuity	L—DLC-2 terminal CAN_L	Continuity detected	• Wiring harness (L—DLC-2 terminal CAN_L)
M	—	—	—	—	—	—
N	Power supply (system)	Ignition switch	Voltage	The ignition switch is at the ON position.	B+	• Wiring harness (N—ignition switch)
				The ignition switch is off.	1 V or less	—
O	RF wheel-speed (ground)	RF ABS wheel-speed sensor	Continuity	O—RF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (O—RF ABS wheel-speed sensor terminal B)
P	—	—	—	—	—	—
Q	RF wheel-speed (signal)	RF ABS wheel-speed sensor	Continuity	Q—RF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (Q—RF ABS wheel-speed sensor terminal A)
R	—	—	—	—	—	—
S	—	—	—	—	—	—
T	—	—	—	—	—	—
U	LR wheel-speed (signal)	LR ABS wheel-speed sensor	Continuity	U—LR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (U—LR ABS wheel-speed sensor terminal A)
V	—	—	—	—	—	—
W	LR wheel-speed (ground)	LR ABS wheel-speed sensor	Continuity	W—LR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (W—LR ABS wheel-speed sensor terminal B)
X	—	—	—	—	—	—
Y	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (Y—battery)
Z	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (Z—battery)

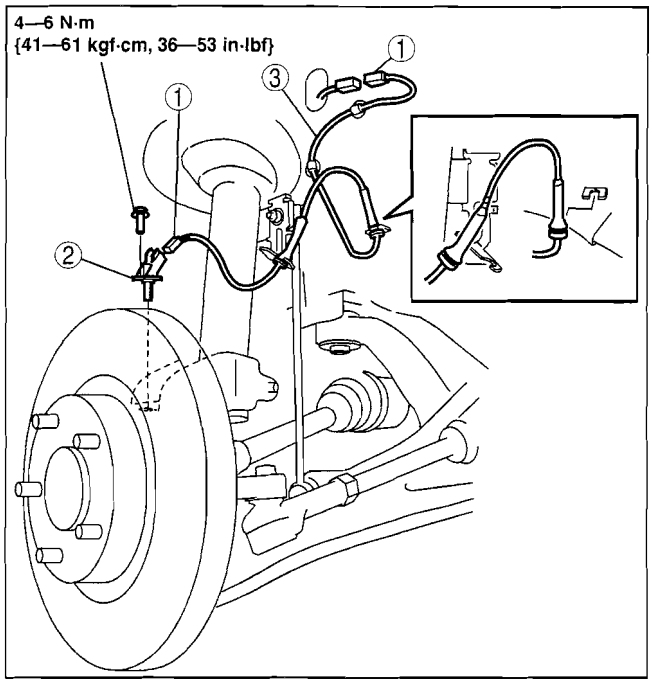
FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041300800700

1. Remove the mudguard.
2. Remove in the order indicated in the table.

1	Connector
2	Front ABS wheel-speed sensor
3	Front ABS wheel-speed sensor wiring harness

3. Install in the reverse order of removal.



c3u0413w001

FRONT ABS WHEEL-SPEED SENSOR INSPECTION

id041300801300

Installation Visual Inspection

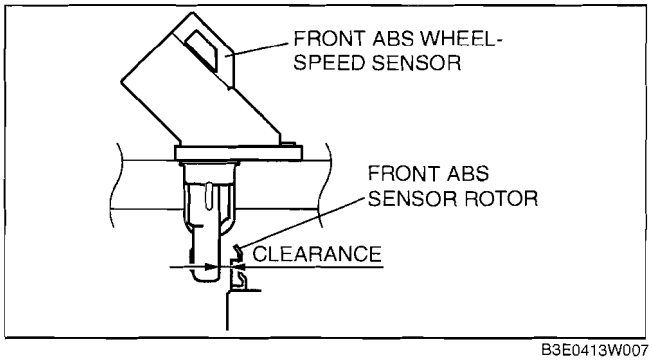
1. Inspect for the following:
   - If there is any malfunction, replace the part.

   (1) Excessive play of the ABS wheel-speed sensor
   (2) Deformation of the ABS wheel-speed sensor
   (3) Deformation or damage of the ABS sensor rotor

Clearance Inspection

1. Inspect the clearance between the front ABS wheel-speed sensor and the ABS sensor rotor.
   - If there is any malfunction, verify improper installation and replace if necessary.

Clearance
2.1 mm {0.082 in} or less



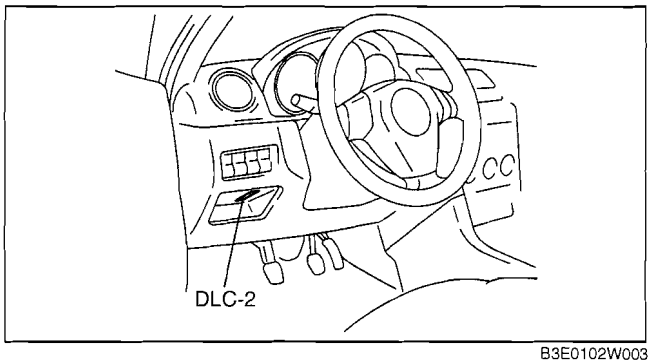
B3E0413W007

Sensor Output Value Inspection

Caution

- **Resistance inspection using other testers may cause damage to the ABS wheel-speed sensor internal circuit. Be sure to use the M-MDS to inspect the ABS wheel-speed sensor.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs using the M-MDS:
   - LF_WSPD
     (LF wheel-speed sensor)
   - RF_WSPD
     (RF wheel-speed sensor)
4. Start the engine and drive the vehicle.
5. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the front ABS wheel-speed sensor.

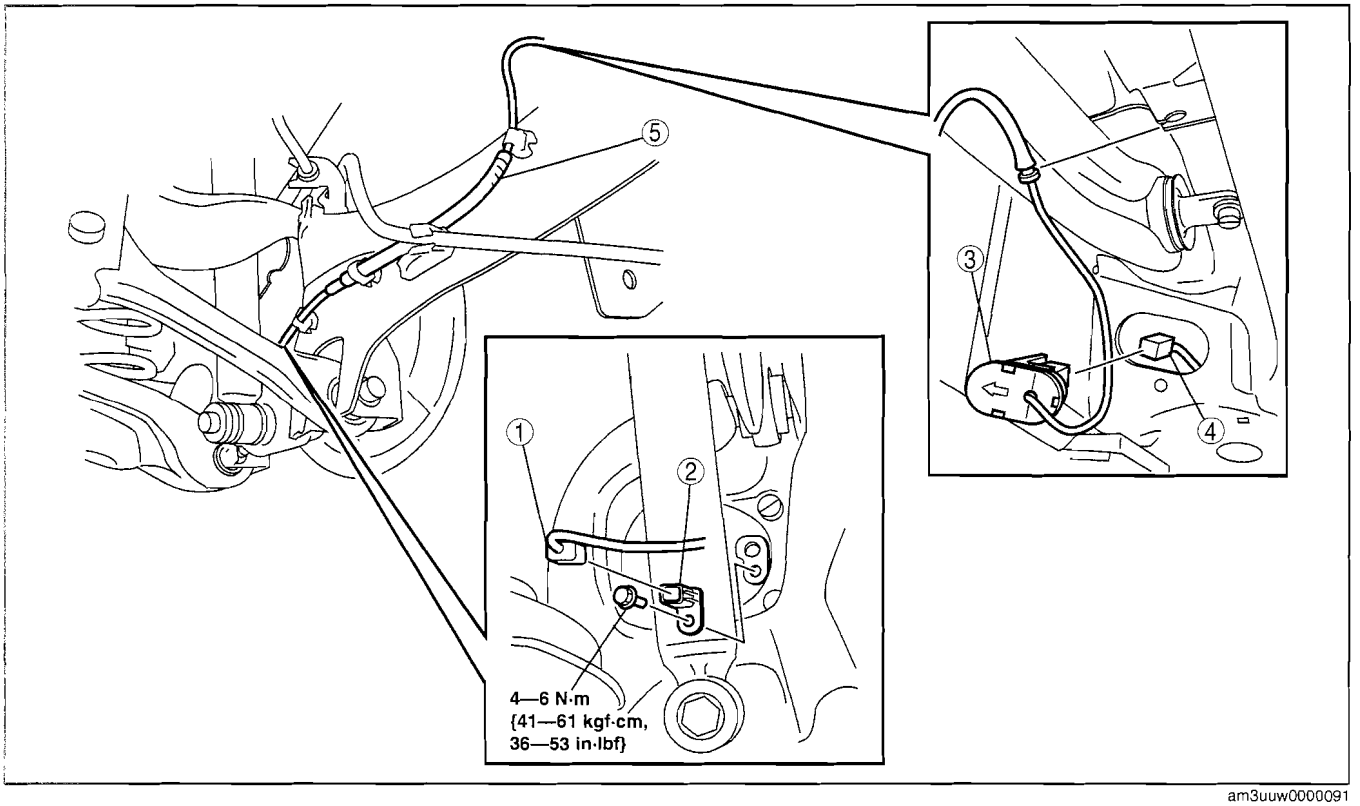


B3E0102W003

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041300800500

1. Remove the under cover (rear).
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



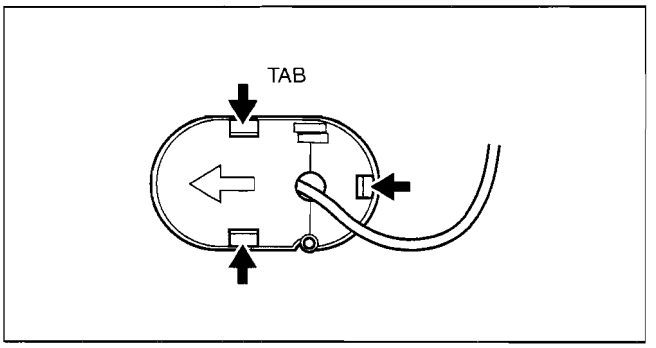
am3uuw0000091

1	Connector
2	Rear ABS wheel-speed sensor
3	ABS hole cover (See 04-13-10 ABS Hole Cover Removal Note.) (See 04-13-10 ABS Hole Cover Installation Note.)

4	Connector
5	Rear ABS wheel-speed sensor wiring harness (See 04-13-10 Rear ABS Wheel-speed Sensor Wiring Harness Installation Note.)

ABS Hole Cover Removal Note

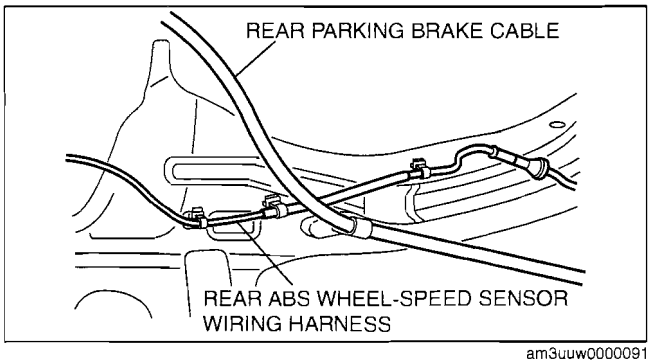
1. Press the tab of the ABS hole cover to separate the ABS hole cover from the body.
2. Remove the ABS hole cover from the body.



am3uuw0000091

Rear ABS Wheel-speed Sensor Wiring Harness Installation Note

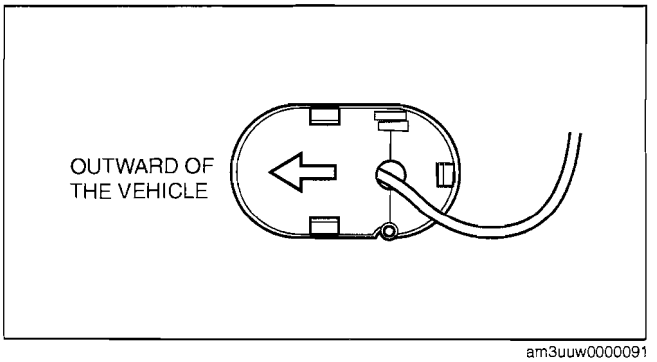
1. Pass the rear ABS wheel-speed sensor wiring harness outside the rear parking brake cable as shown in the figure.
2. Install the rear ABS wheel-speed sensor wiring harness.



am3uuw0000091

ABS Hole Cover Installation Note

1. Install the ABS hole cover into the body so that the arrow on it is facing toward the outer side of the vehicle.



am3uuw0000091

REAR ABS WHEEL-SPEED SENSOR INSPECTION

id041300801200

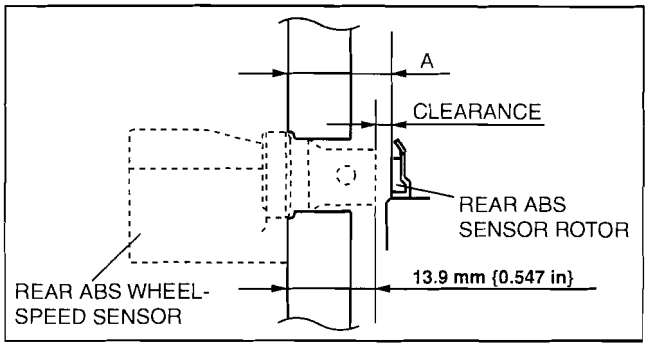
Installation Visual Inspection

1. Inspect for the following:
   - If there is any malfunction, replace the part.

   (1) Excessive looseness or play of the ABS wheel-speed sensor
   (2) Deformation of the ABS wheel-speed sensor
   (3) Deformation or damage of the ABS sensor rotor

Clearance Inspection

1. Remove the rear ABS wheel-speed sensor.
2. Measure the distance between the rear ABS wheel-speed sensor installation surface and the ABS sensor rotor. This is dimension A.
3. Calculate the clearance between the rear ABS wheel-speed sensor and the ABS sensor rotor using the following formula:
   Clearance (mm {in}) = A –13.9 {0.547}
4. Verify that the clearance between the ABS sensor rotor and the rear ABS wheel-speed sensor is as indicated below.
   - If there is any malfunction, replace it.



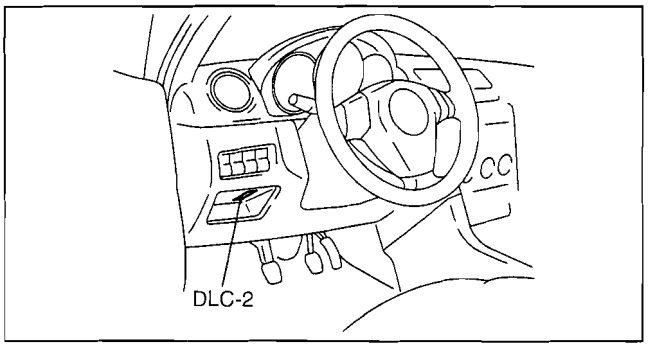
B3E0413W008

Clearance
1.46 mm {0.057 in} or less

Sensor Output Value Inspection

Caution
- **Resistance inspection using other testers may cause damage to the ABS wheel-speed sensor internal circuit. Be sure to use the M-MDS to inspect the ABS wheel-speed sensor.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs using the M-MDS:
   - LR_WSPD
     (LR wheel-speed sensor)
   - RR_WSPD
     (RR wheel-speed sensor)
4. Start the engine and drive the vehicle.
5. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the ABS wheel-speed sensor.

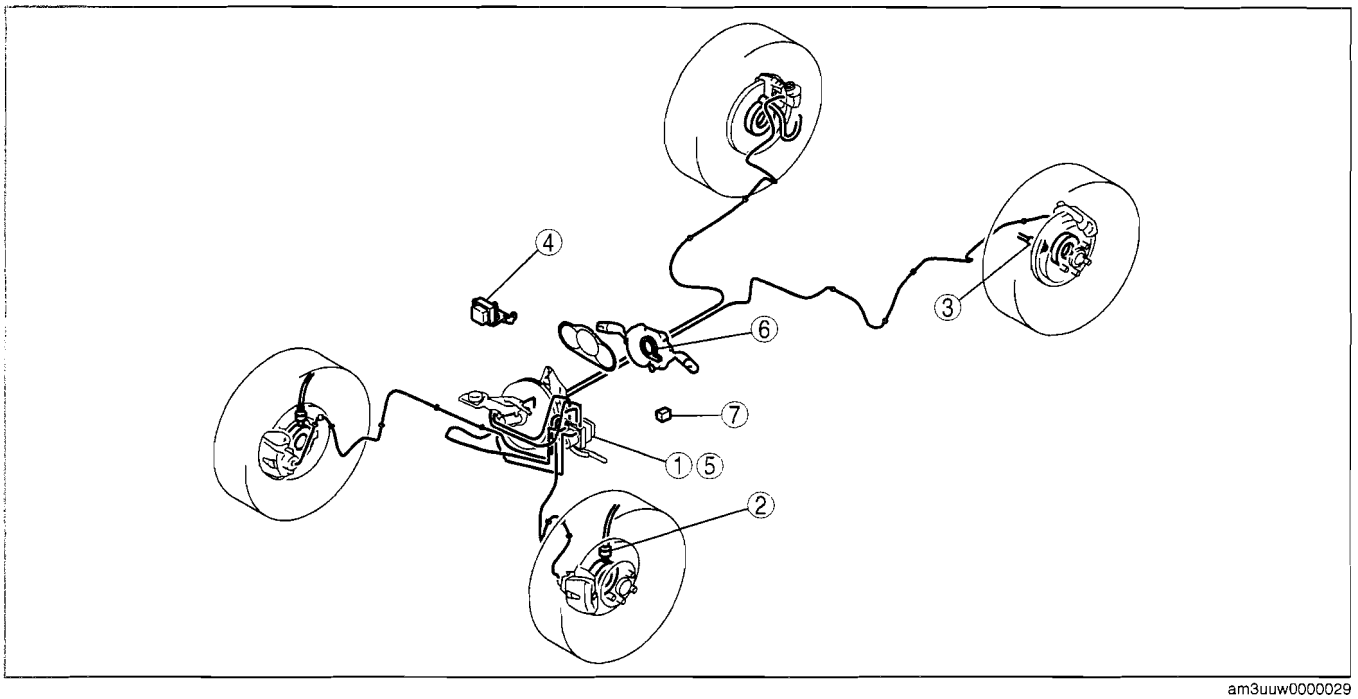


B3E0102W003

04-15 DYNAMIC STABILITY CONTROL

DSC LOCATION INDEX

id041500802100

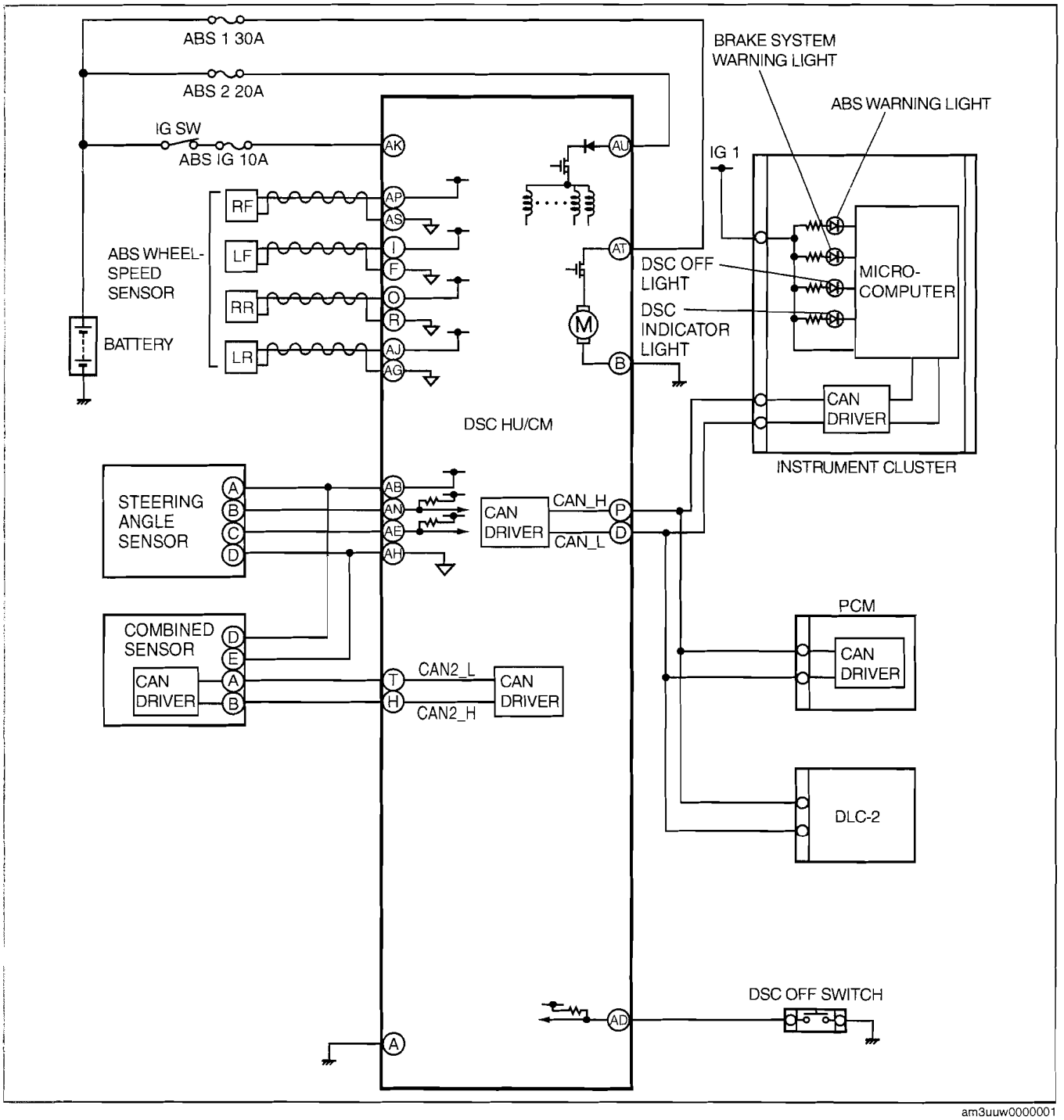


am3uuw0000029

1	DSC HU/CM (See 04-15-3 DSC SYSTEM INSPECTION.) (See 04-15-6 DSC HU/CM REMOVAL/ INSTALLATION.) (See 04-15-8 DSC CONFIGURATION.) (See 04-15-8 DSC HU/CM INSPECTION.)
2	Front ABS wheel-speed sensor (See 04-15-10 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-15-10 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)
3	Rear ABS wheel-speed sensor (See 04-15-10 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.) (See 04-15-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)
4	Combined sensor (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.) (See 04-15-11 COMBINED SENSOR INSPECTION.) (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.)
5	Brake fluid pressure sensor (Built into DSC HU/CM) (See 04-15-12 BRAKE FLUID PRESSURE SENSOR INSPECTION.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
6	Steering angle sensor (See 04-15-13 STEERING ANGLE SENSOR REMOVAL/INSTALLATION.) (See 04-15-13 STEERING ANGLE SENSOR INSPECTION.)
7	DSC OFF switch (See 04-15-14 DSC OFF SWITCH REMOVAL/ INSTALLATION.) (See 04-15-14 DSC OFF SWITCH INSPECTION.)

DSC SYSTEM WIRING DIAGRAM

id041500800600



am3uuw0000001

DSC SYSTEM INSPECTION

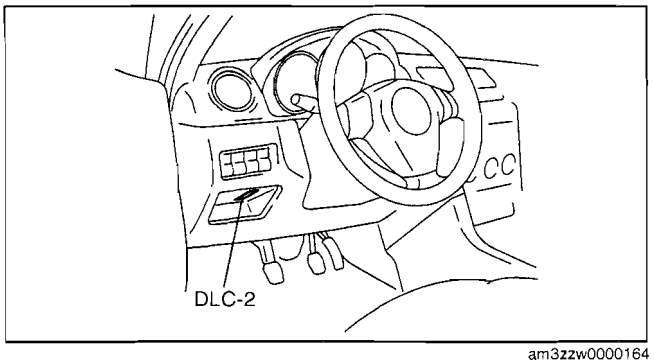
id041500800700

Preparation

1. Verify that the battery is fully charged.
2. Turn the ignition switch to the ON position and verify that the ABS warning light goes out after **approx. 3.0 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to the N position.
6. Verify that all four wheels rotate.
7. Rotate the inspected wheels by hand and verify there is no brake drag.
   - If there is any brake drag, perform regular brake inspection.
   - If there is no brake drag, perform DSC HU/CM operation inspection.

ABS Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)



am3zzw0000164

Brake pressure retention

Command name	Inspected wheels			
	LF	RF	LR	RR
LF_TC_PRV	OFF			
RF_TC_PRV				
LF_TC_SWV				
RF_TC_SWV				
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET	OFF			
LR_INLET			ON	
LR_OUTLET			OFF	
RF_INLET		ON		
RF_OUTLET		OFF		
RR_INLET				ON
RR_OUTLET				OFF
PMP_MOTOR				

Brake pressure reduction

Command name	Inspected wheels			
	LF	RF	LR	RR
LF_TC_PRV	OFF			
RF_TC_PRV				
LF_TC_SWV				
RF_TC_SWV				
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET				
LR_INLET	OFF		ON	
LR_OUTLET				
RF_INLET		ON	OFF	
RF_OUTLET				
RR_INLET		OFF		ON
RR_OUTLET				
PMP_MOTOR	ON			

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the DSC HU/CM.**

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

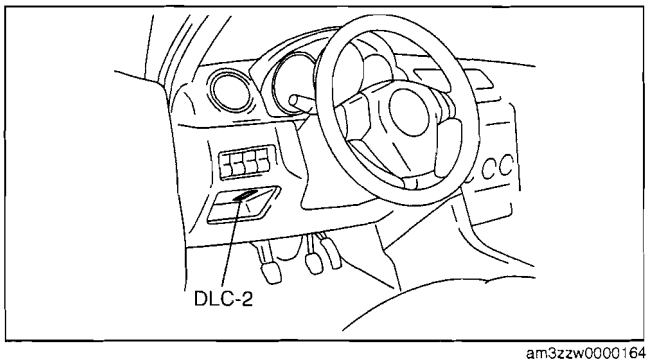
4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.
5. When brake pressure is maintained and a DSC HU/CM operation click sound is heard, confirm that the wheel does not rotate. When brake pressure is being reduced and a DSC HU/CM operation click sound is heard, confirm that the wheel rotates.
   - Performing the inspection above determines the following:
     — The DSC HU/CM brake lines are normal.
     — The DSC HU/CM hydraulic system has no significant malfunction (including DSC HU/CM).
     — The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
     — The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
   - However, the following items cannot be verified.
     — Intermittent malfunction of the above items
     — Malfunction of DSC HU/CM input system wiring harnesses and parts
     — Extremely small leakage in the DSC HU/CM internal hydraulic system

DSC Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

Caution

- **When operating the solenoid valve and pump motor using the active command mode, make sure to keep the operation time within 2 s to prevent damaging the DSC HU/CM.**



am3zzw0000164

Command name	Inspected wheels			
	Understeer control disabled		Oversteer control disabled	
	LF	RF	LR	RR
LF_TC_PRV	ON	OFF		ON
RF_TC_PRV	OFF	ON		OFF
LF_TC_SWV	OFF			
RF_TC_SWV				
LF_INLET	OFF	OFF	OFF	ON
LF_OUTLET				OFF
LR_INLET		ON		
LR_OUTLET		OFF		
RF_INLET			ON	
RF_OUTLET			OFF	
RR_INLET	ON			
RR_OUTLET	OFF			
PMP_MOTOR	ON			

4. Send the command while rotating the wheel being inspected by hand in a forward direction.
5. Confirm that the wheel does not rotate easily while a DSC HU/CM operation click sound is heard.
   - Performing the inspection above determines the following:
     — The DSC HU/CM brake lines are normal.
     — The DSC HU/CM hydraulic system has no significant malfunction (including DSC HU/CM).
     — The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
     — The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
   - However, the following items cannot be verified.
     — Intermittent malfunction of the above items
     — Malfunction of DSC HU/CM input system wiring harnesses and parts
     — Extremely small leakage in the DSC HU/CM internal hydraulic system

DSC HU/CM REMOVAL/INSTALLATION

id041500801000

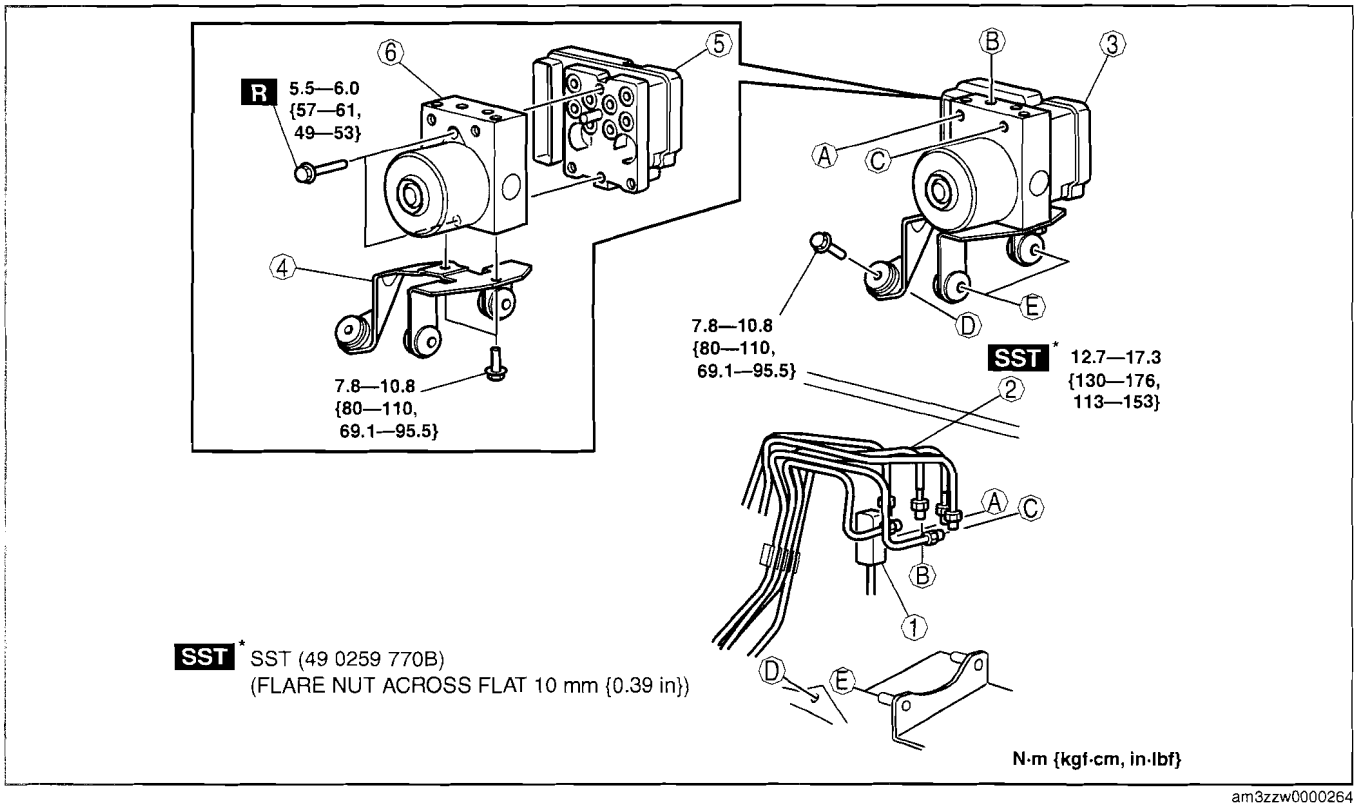
Caution

- **When replacing the DSC HU/CM, the configuration procedure must be done before removing the DSC HU/CM. If the configuration is not completed before removing the DSC HU/CM, DSC will not work properly after installation of the DSC HU/CM.**
- **The DSC may not function normally immediately after the DSC HU/CM is replaced. After installation, always perform the initialization procedures for the combined sensor, brake fluid pressure sensor.**
- **Always use the adapter that comes with a new DSC HU or DSC CM when separating the DSC HU or DSC CM. Otherwise, the pump motor may come off the DSC HU and be damaged. Therefore, do not separate the DSC HU and DSC CM unless replacing them. When replacing them with new ones, always perform procedures according to the instructions included with the new parts.**
- **The internal parts of the DSC HU/CM could be damaged if dropped. Be careful not to drop the DSC HU/CM. Replace the DSC HU/CM if it is subjected to an impact.**

1. Remove the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove the reserve hose (MTX vehicles). (See 04-11-10 MASTER CYLINDER REMOVAL/INSTALLATION[L3 WITH TC].) (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Configurate the DSC HU/CM (only when replacing it). (See 04-15-8 DSC CONFIGURATION.)
6. Perform the initialization procedures for the combined sensor, brake fluid pressure sensor. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.) (See 04-15-13 BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE.)
7. Clear the DTCs from the memory. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)

Note

- Even if the initialization procedure is performed after replacing the DSC HU/CM, DTCs B2141 and C2785 are stored in the memory as past malfunctions.

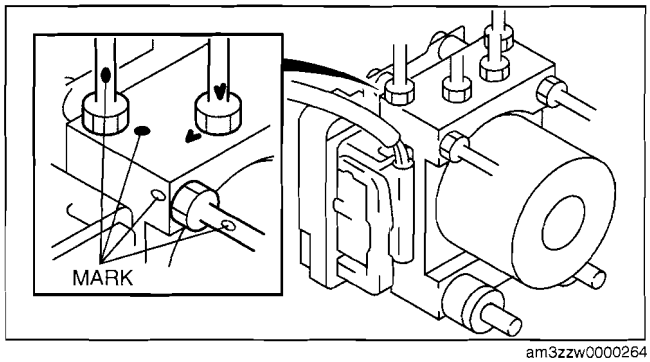


am3zzw0000264

1	Connector (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION.)
2	Brake pipe (See 04-15-7 Brake Pipe Removal Note.) (See 04-15-7 Brake Pipe Installation Note.)
3	DSC HU/CM, bracket (See 04-15-7 DSC HU/CM, Bracket Removal Note.)
4	Bracket
5	DSC CM
6	DSC HU

Brake Pipe Removal Note

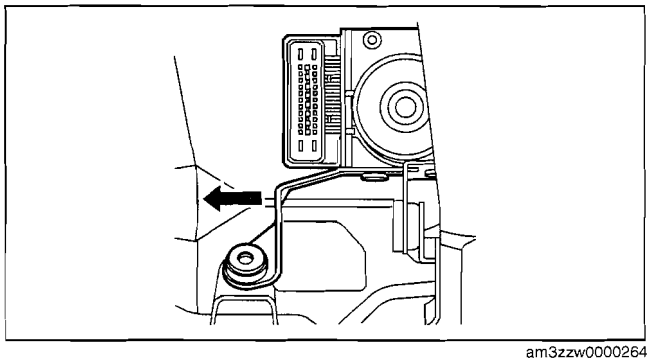
1. Place an alignment mark on the brake pipe and DSC HU/CM.
2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.



am3zzw0000264

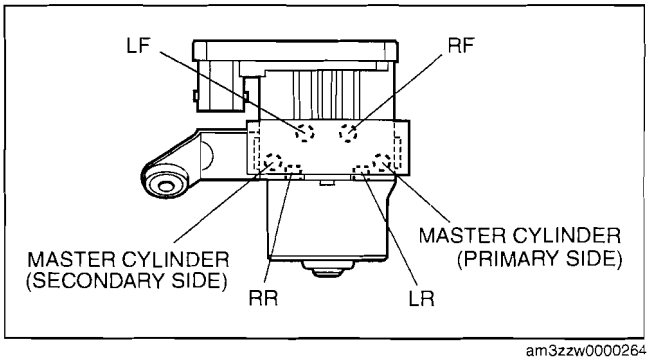
DSC HU/CM, Bracket Removal Note

1. As shown in the figure, move the bracket in the direction of the arrow and remove the DSC HU/CM and bracket from the body.


am3zzw0000264

Brake Pipe Installation Note

1. Align the marks made before removal and install the brake pipe into the DSC HU/CM referring to the figure.

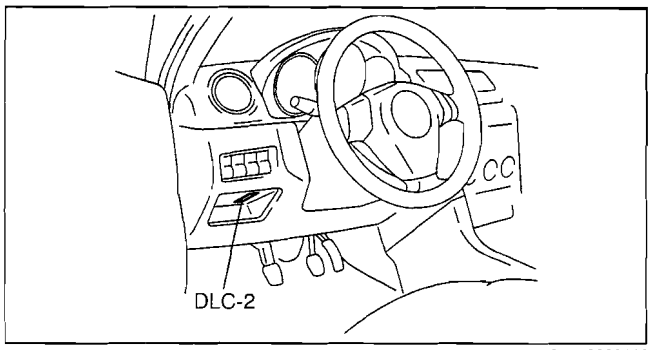


am3zzw0000264

DSC CONFIGURATION

id041500800800

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module programming".
3. Then, select the "Programmable Module Installation" and "ABS" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)



am3zzw0000162

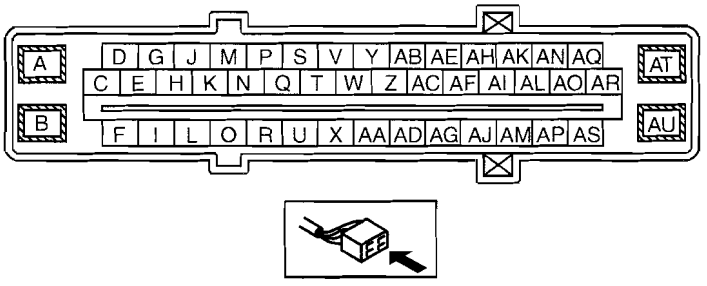
DSC HU/CM INSPECTION

id041500801100

1. Disconnect the DSC HU/CM connector.
2. Connect the negative battery cable.
3. Attach the tester lead to the DSC HU/CM wiring harness-side connector and inspect voltage, continuity, or resistance according to the standard (reference) on the table.

Standard (Reference)

DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



am3zzw0000264

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
A	Ground (system)	Ground point	Continuity	A—ground point	Continuity detected	• Wiring harness (A—ground point)
B	Ground (ABS motor)	Ground point	Continuity	B—ground point	Continuity detected	• Wiring harness (B—ground point)
C	—	—	—	—	—	—
D	CAN_L	DLC-2 (CAN_L)	Continuity	D—DLC-2 terminal CAN_L	Continuity detected	• D—DLC-2 terminal CAN_L
E	—	—	—	—	—	—
F	LF wheel-speed sensor (ground)	LF wheel-speed sensor	Continuity	F—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (F—LF ABS wheel-speed sensor terminal A)
G	—	—	—	—	—	—
H	CAN2_H	Combined sensor	Continuity	H—combined sensor terminal B	Continuity detected	• Wiring harness (H—combined sensor terminal B)
I	LF wheel-speed sensor (single)	LF ABS wheel-speed sensor	Continuity	I—LF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (I—LF ABS wheel-speed sensor terminal A)
J	—	—	—	—	—	—
K	—	—	—	—	—	—
L	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
M	—	—	—	—	—	—
N	—	—	—	—	—	—
O	RR wheel-speed (signal)	RR ABS wheel-speed sensor	Continuity	O—RR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (O—RR ABS wheel-speed sensor terminal A)
P	CAN_H	DLC-2 (CAN_H)	Continuity	P—DLC-2 terminal CAN_H	Continuity detected	• Wiring harness (P—DLC-2 terminal CAN_H)
Q	—	—	—	—	—	—
R	RR wheel-speed (ground)	RR ABS wheel-speed sensor	Continuity	R—RR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (R—RR ABS wheel-speed sensor terminal B)
S	—	—	—	—	—	—
T	CAN2_L	Combined sensor	Continuity	T—combined sensor terminal A	Continuity detected	• Wiring harness (T—combined sensor terminal A)
U	—	—	—	—	—	—
V	—	—	—	—	—	—
W	—	—	—	—	—	—
X	—	—	—	—	—	—
Y	—	—	—	—	—	—
Z	—	—	—	—	—	—
AA	—	—	—	—	—	—
AB	Sensor power supply	Combined sensor, steering angle sensor	Continuity	AB—combined sensor terminal D AB—steering angle sensor terminal A	Continuity detected	• Wiring harness (AB—combined sensor terminal D) • Wiring harness (AB—steering angle sensor terminal A)
AC	—	—	—	—	—	—
AD	DSC OFF switch	DSC OFF switch	Continuity	AD—DSC OFF switch	Continuity detected	• Wiring harness (AD—DSC OFF switch)
AE	Steering angle sensor (signal B)	Steering angle sensor	Continuity	AE—steering angle sensor terminal C	Continuity detected	• Wiring harness (AE—steering angle sensor terminal C)
AF	—	—	—	—	—	—
AG	LR wheel-speed (ground)	LR wheel-speed sensor	Continuity	AG—LR ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (AG—LR ABS wheel-speed sensor terminal B)
AH	Sensor ground	Combined sensor, steering angle sensor	Continuity	AH—combined sensor terminal E AH—steering angle sensor terminal D	Continuity detected	• Wiring harness (AH—combined sensor terminal E) • Wiring harness (AH—steering angle sensor terminal D)
AI	—	—	—	—	—	—
AJ	LR wheel-speed (signal)	LR ABS wheel-speed sensor	Continuity	AJ—LR ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (AJ—LR ABS wheel-speed sensor terminal A)
AK	Power supply (system)	Ignition switch	Voltage	The ignition switch is at the ON position.	B+	• Wiring harness (AK—ignition switch)
				The ignition switch is off.	1 V or less	—
AL	—	—	—	—	—	—
AM	—	—	—	—	—	—
AN	Steering angle sensor (signal A)	Steering angle sensor	Continuity	AN—steering angle sensor terminal B	Continuity detected	• Wiring harness (AN—steering angle sensor terminal B)
AO	—	—	—	—	—	—

Terminal	Signal name	Connected to	Measured item	Measured terminal (measurement condition)	Standard	Inspection item(s)
AP	RF wheel-speed (signal)	RF ABS wheel-speed sensor	Continuity	AP—RF ABS wheel-speed sensor terminal A	Continuity detected	• Wiring harness (AP—RF ABS wheel-speed sensor terminal A)
AQ	—	—	—	—	—	—
AR	—	—	—	—	—	—
AS	RF wheel-speed (ground)	RF ABS wheel-speed sensor	Continuity	AS—RF ABS wheel-speed sensor terminal B	Continuity detected	• Wiring harness (AS—RF ABS wheel-speed sensor terminal B)
AT	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AT—battery)
AU	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AU—battery)

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041500800300

1. Remove or install the front ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)

FRONT ABS WHEEL-SPEED SENSOR INSPECTION

id041500800400

1. Inspect the front ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-8 FRONT ABS WHEEL-SPEED SENSOR INSPECTION.)

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

id041500800100

1. Remove or install the rear ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-9 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.)

REAR ABS WHEEL-SPEED SENSOR INSPECTION

id041500800200

1. Inspect the rear ABS wheel-speed sensor in the same order of vehicles with ABS. (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.)

COMBINED SENSOR REMOVAL/INSTALLATION

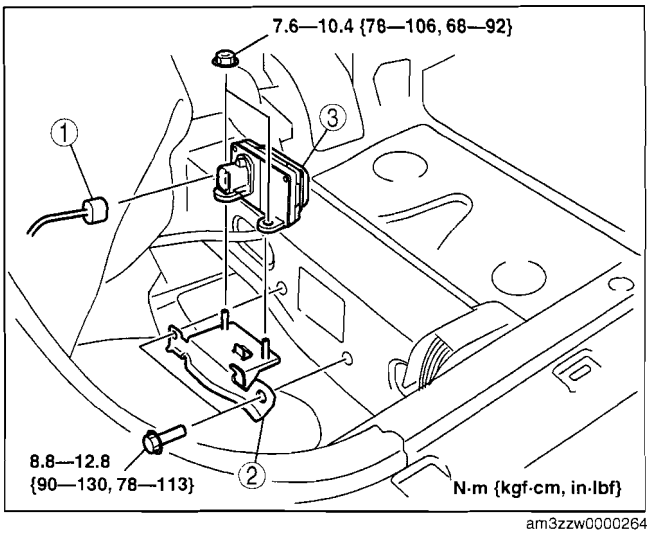
id041500801200

Caution
- **The DSC may not function normally immediately after the combined sensor/ is replaced. After installation, always perform the initialization procedures for the combined sensor.**
- **The internal parts of the combined sensor could be damaged if dropped. Be careful not to drop the combined sensor. Replace the combined sensor if it is subjected to an impact. Also, do not use an impact wrench or other similar air tools when removing/installing the sensor.**

1. Perform the following and partially peel back the floor covering.
   (1) Remove the front seat (RH). (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
   (2) Remove the woofer. (See 09-20-10 WOOFER REMOVAL/INSTALLATION.)
   (3) Remove the front scuff plate (RH). (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Remove the front side trim (RH). (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)

2. Remove in the order indicated in the table.

1	Combined sensor connector
2	Bracket
3	Combined sensor



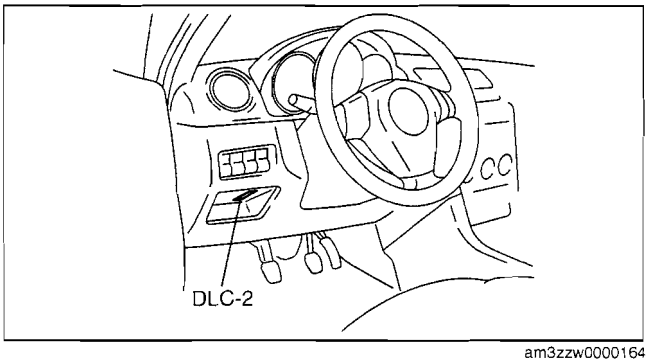
am3zzw0000264

3. Install in the reverse order of removal.
4. After installation, perform the combined sensor initialization procedure. (See 04-15-12 COMBINED SENSOR INITIALIZATION PROCEDURE.)

COMBINED SENSOR INSPECTION

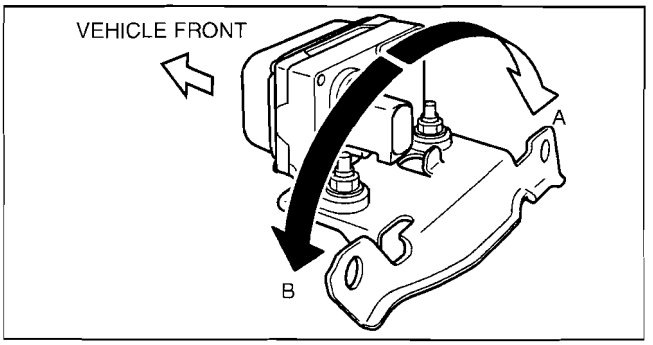
id041500801300

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. Select the following PIDs and inspect the lateral acceleration and yaw rate. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
   — LAT_ACCL (lateral acceleration)
   — YAW_RATE (yaw rate)
   (1) Lateral acceleration inspection



am3zzw0000164

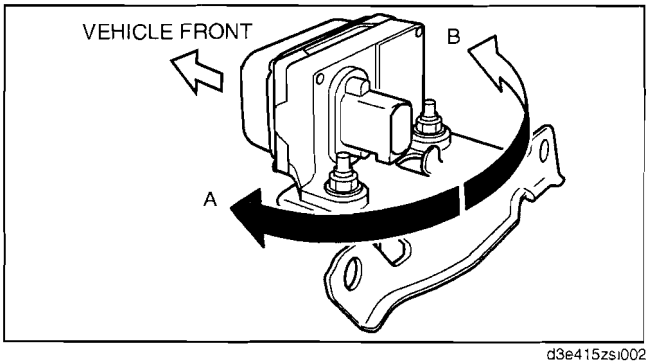
1) Verify the LAT_ACCL change when the combined sensor is tilted to the left and right.
- If there is any malfunction, replace the combined sensor.(See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)



am3zzw0000164

Standard
When the sensor is tilted to the right (A):
LAT_ACCL changes positively.
When the sensor is tilted to the left (B):
LAT_ACCL changes negatively.

(2) Yaw rate inspection
1) Verify the YAW_RATE change when the combined sensor is rotated to the left and right.
- If there is any malfunction, replace the combined sensor. (See 04-15-10 COMBINED SENSOR REMOVAL/ INSTALLATION.)



d3e415zsi002

Standard
When the sensor is rotated to the right (A):
YAW_RATE changes negatively.
When the sensor is rotated to the left (B):
YAW_RATE changes positively.

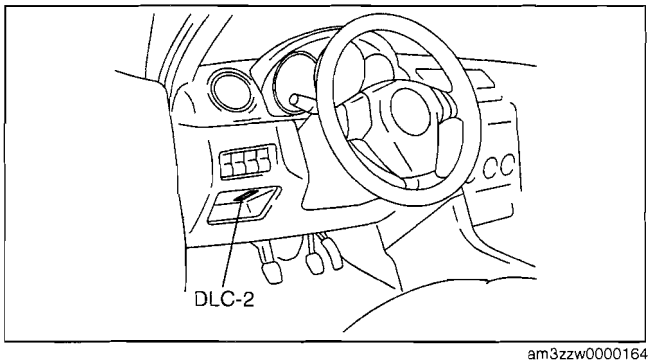
COMBINED SENSOR INITIALIZATION PROCEDURE

id041500801400

Warning

- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, after replacing or removing the combined sensor or DSC HU/CM, make sure to perform the initialization procedure to insure proper DSC operation.**

1. Inspect the wheel alignment and the tire pressure.
   - If there is any malfunction, adjust the applicable part.
2. Position the vehicle on level ground.
3. Turn the ignition switch off.
4. Connect the M-MDS to the DLC-2.
5. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Chassis".
     2. Select "ABS/DSC".
     3. Select "Sensor Initialization".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
     4. Select "LATACCEL".
6. Perform the initialization procedure according to the directions on the screen.
7. Drive the vehicle.
8. After **5 min or more** of driving, verify that the DSC system is normal.



am3zzw0000164

BRAKE FLUID PRESSURE SENSOR INSPECTION

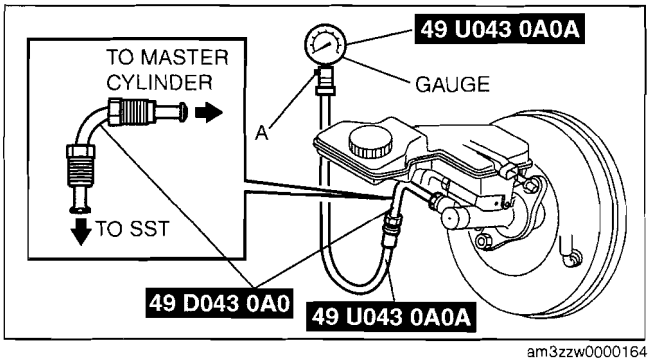
id041500801500

1. Turn the ignition switch off.
2. Install the **SSTs** to the master cylinder as shown in the figure.

Note

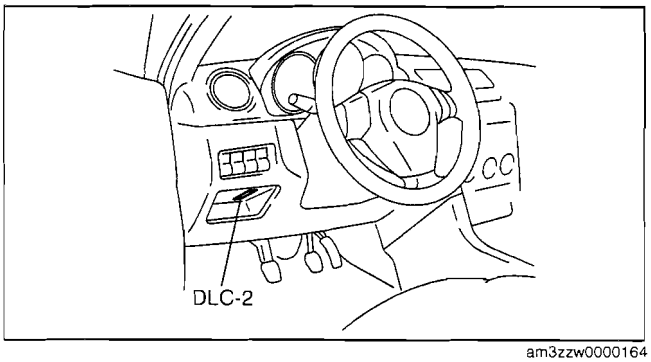
- When installing the **SST** (49 D043 0A0) to the master cylinder, use a commercially available flare nut wrench (flare nut across flat **12 mm {0.47 in}**).

3. Bleed the brake line and the **SSTs** of air. (Bleed the **SSTs** of air using air bleed valve A.)



am3zzw0000164

4. Connect the M-MDS to the DLC-2.
5. Select the "MPRETDR" PID. (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
6. Start the engine.
7. Depress the brake pedal, and verify that the fluid pressure value of the **SST** (gauge) and the value shown on the M-MDS are equal.
   - If the fluid pressure values are different, replace the DSC HU/CM. (See 04-15-6 DSC HU/CM REMOVAL/INSTALLATION.)



am3zzw0000164

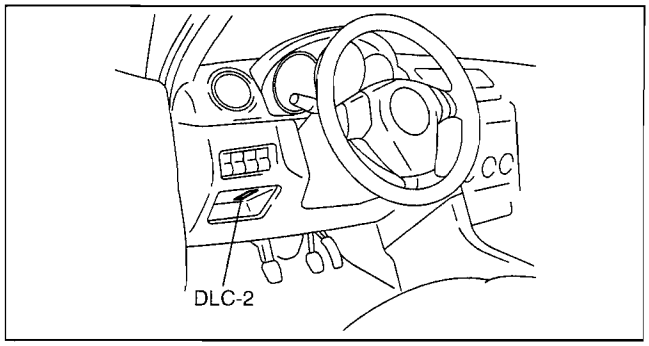
BRAKE FLUID PRESSURE SENSOR INITIALIZATION PROCEDURE

id041500802200

Warning

- **If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, after replacing or removing the DSC HU/CM, make sure to perform the initialization procedure to insure proper DSC operation.**

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Chassis".
     2. Select "ABS/DSC".
     3. Select "Sensor Initialization".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".
     4. Select "MCYL_S_CAL".
4. Perform the initialization procedure according to the directions on the screen.
5. Drive the vehicle.
6. After **5 min or more** of driving, verify that the DSC system is normal.



am3zzw0000164

STEERING ANGLE SENSOR REMOVAL/INSTALLATION

id041500801600

1. When removing or installing the steering angle sensor, refer to the clock spring removal/installation procedure. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

STEERING ANGLE SENSOR INSPECTION

id041500801700

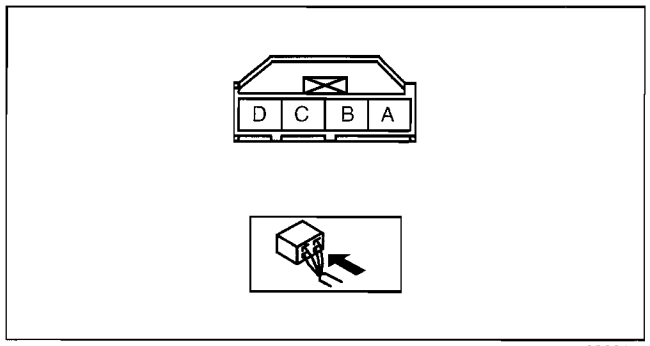
1. Remove the column cover.
2. Turn the ignition switch to the ON position and measure the voltage between steering angle sensor terminal A and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal A and DSC HU/CM terminal AB. Repair or replace if necessary.

   Standard voltage
   B+

3. Measure the voltage between steering angle sensor terminal D and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal D and DSC HU/CM terminal AH. Repair or replace if necessary.

   Standard voltage
   0 V

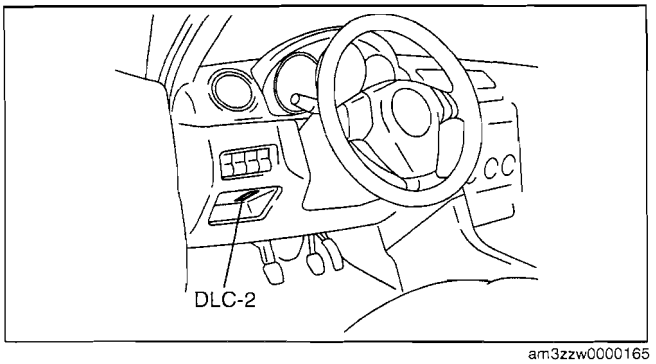
4. Turn the ignition switch off.



am3zzw0000165

5. Connect the M-MDS to the DLC-2.
6. Select the "SWA_POS" PID.
7. Verify the SWA_POS changes when the steering wheel is turned to the left and right.
   - If there is any malfunction, replace the steering angle sensor. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

Standard
When the steering wheel is turned to the left:
SWA_POS changes positively.
When the steering wheel is turned to the right:
SWA_POS changes negatively.

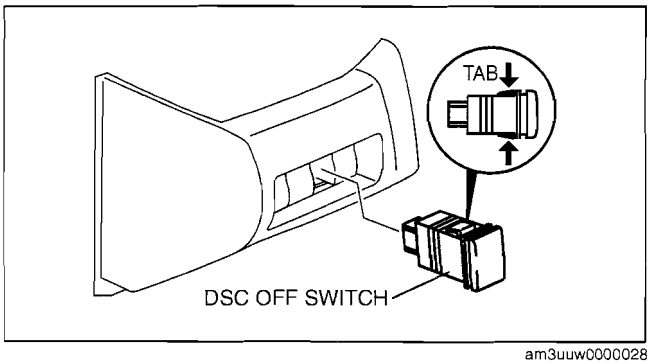


am3zzw0000165

DSC OFF SWITCH REMOVAL/INSTALLATION

id041500801900

1. Remove the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
2. While squeezing the tabs of the DSC OFF switch, pull the DSC OFF switch outward to remove it from the lower panel.
3. Install in the reverse order of removal.

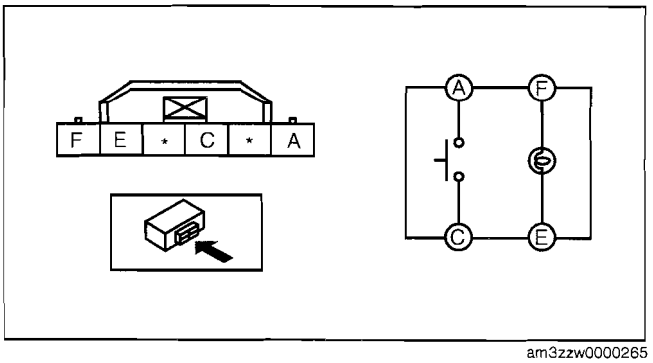


am3uuw0000028

DSC OFF SWITCH INSPECTION

id041500802000

1. Remove the DSC OFF switch. (See 04-15-14 DSC OFF SWITCH REMOVAL/INSTALLATION.)
2. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the DSC OFF switch.



am3zzw0000265

: Bulb : Continuity

Condition	Terminal			
	A	C	F	E
Switch pressed	○—○		○—⓪—○	
Switch released			○—⓪—○	

am3zzw0000265

04-50 TECHNICAL DATA

BRAKES TECHNICAL DATA

id045000800100

Item	Specification
Brake fluid type	SAE J1703, FMVSS 116 DOT3
Brake pedal height (reference value)	136.4 mm {5.37 in}
Brake pedal play	4.0—8.4 mm {0.16—0.33 in}
Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 kgf, 33.0 lbf})	89.8 mm {3.54 in} or more
Front disc plate runout limit	0.05 mm {0.002 in}
Minimum front disc plate thickness	23 mm {0.91 in}
Minimum front disc plate thickness after machining using a brake lathe on-vehicle	23.8 mm {0.94 in}
Minimum front disc pad thickness	2.0 mm {0.079 in} min.
Rear disc plate runout limit	0.05 mm {0.002 in}
Minimum read disc plate thickness	9 mm {0.35 in}
Minimum rear disc plate thickness after machining using a brake lathe on-vehicle	9.8 mm {0.39 in}
Minimum rear disc pat thickness	2.0 mm {0.079 in} min.
Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}	3—7 notches

Master cylinder fluid pressure

Vacuum amount at o kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	500 kPa {5.10 kgf/cm^2, 72.6 psi} or more

Master cylinder fluid pressure (except L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	6,500 kPa {66.29 kgf/cm^2, 942.8 psi} or more

Master cylinder fluid pressure (L3 WITH TC)

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	**Fluid pressure (kPa {kgf/cm2, psi})**
200 N {20.4kgf, 44.9lbt}	7,000 kPa {71.39 kgf/cm^2, 1,016 psi} or more

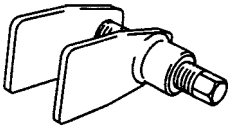
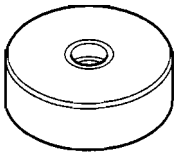
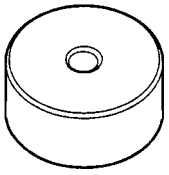
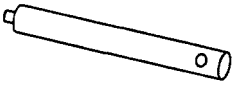
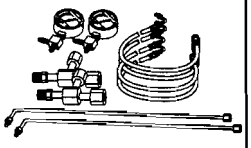
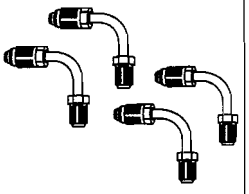
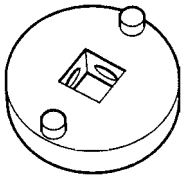
Proportioning valve fluid pressure

Front brake fluid pressure (kPa {kgf/cm^2, psi})	Rear brake fluid pressure (kPa {kgf/cm^2, psi})
5,000 {50.99, 725.2}	3,500—3,700 {35.70—37.72, 507.7—536.6}
10,000 {101.97, 1450.4}	4,950—5,250 {50.48—53.53, 718.0—761.4}

04-60 SERVICE TOOLS

BRAKES SST

id046000800100

49 0259 770B Flare nut wrench 	49 0221 600C Disc brake expand tool 	49 B033 001 Installer 
49 B026 301 Installer 	49 G033 102 Handle 	49 U043 0A0A Oil pressure gauge set 
49 D043 0A0 Adapter set 	49 F043 002 Wrench 	—

TRANSMISSION/TRANSAXLE

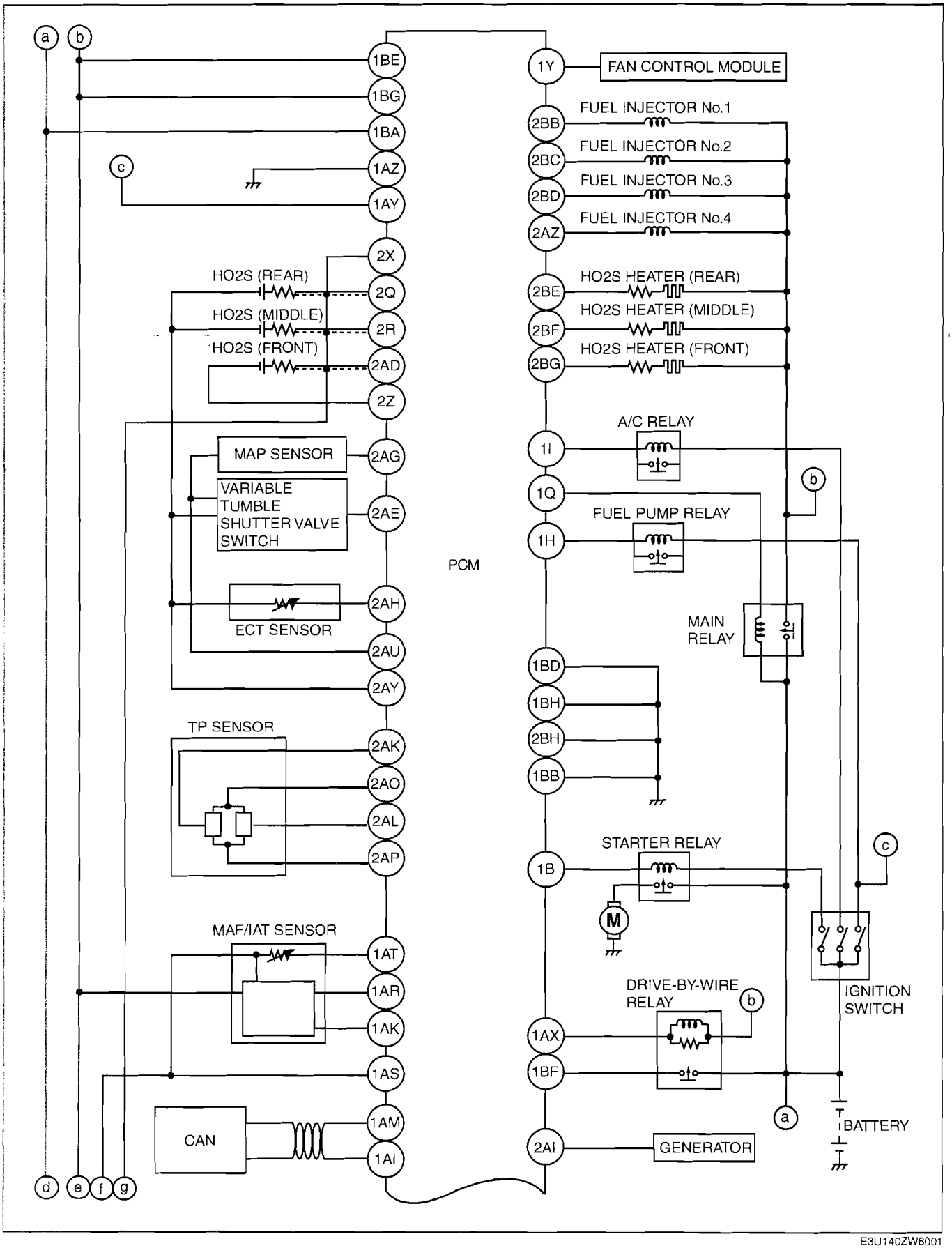
05 SECTION

05-02A ON-BOARD DIAGNOSTIC [FN4A-EL]

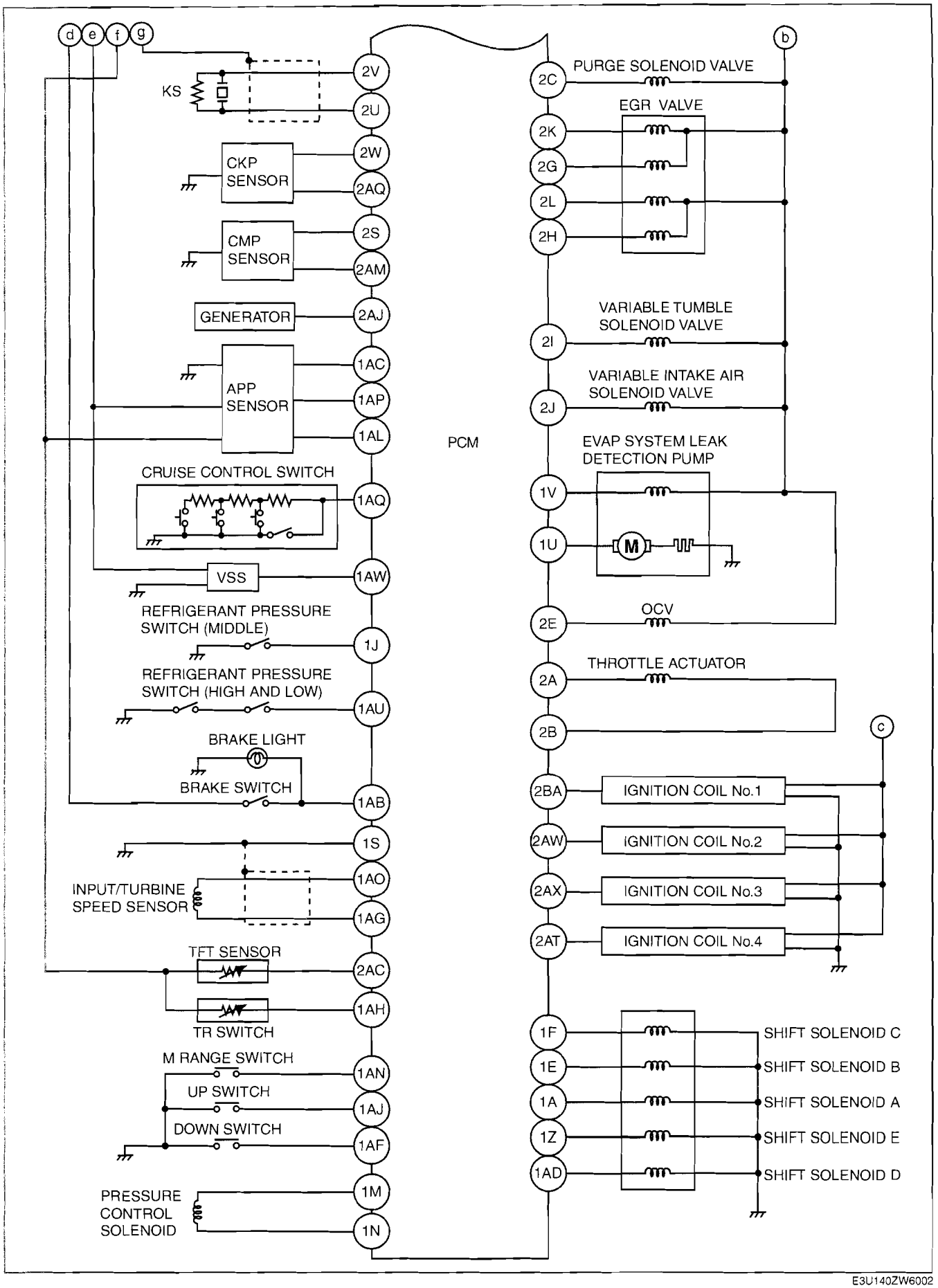
AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FN4A-EL]

id0502a1800100

California Emission Regulation Applicable Model

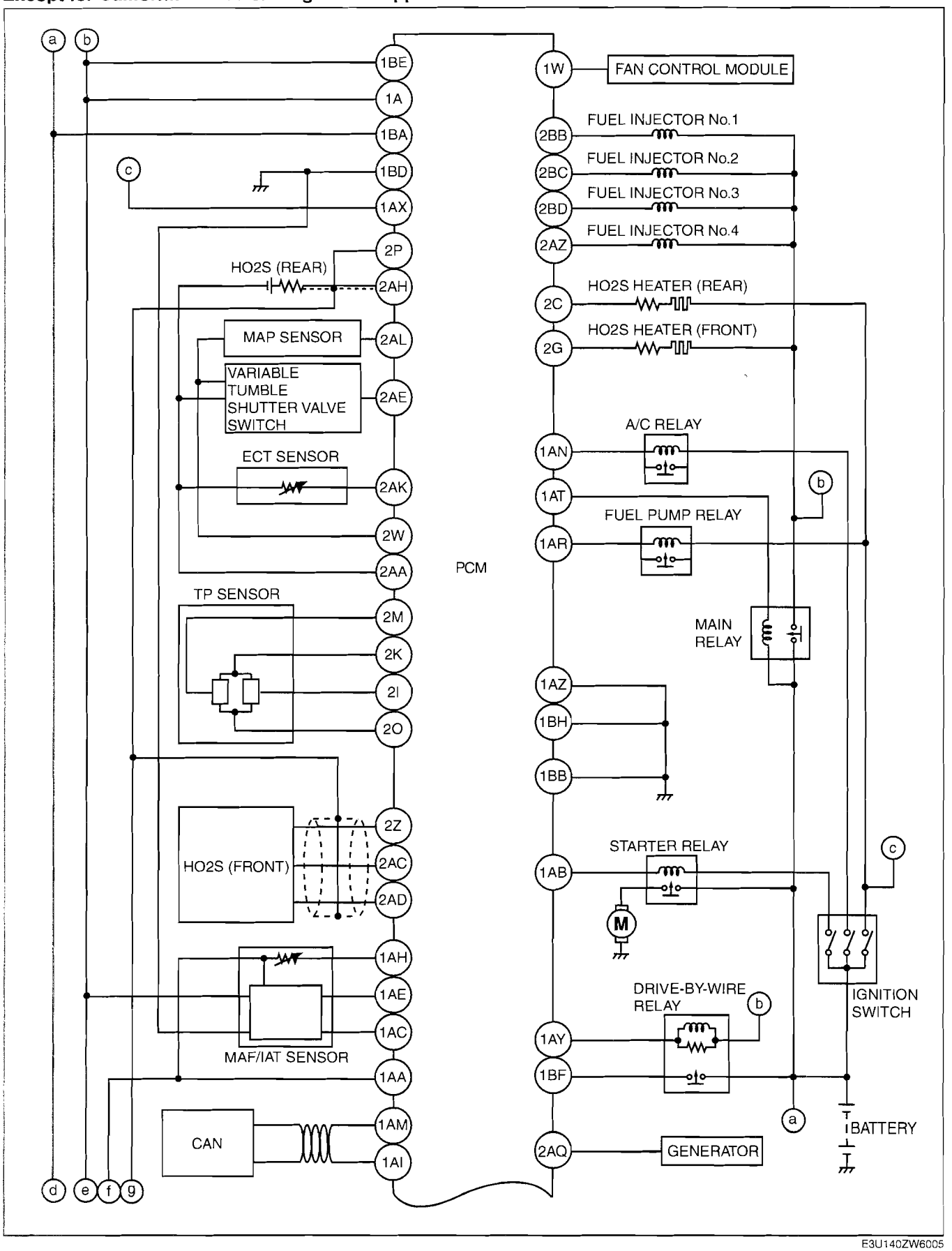


E3U140ZW6001

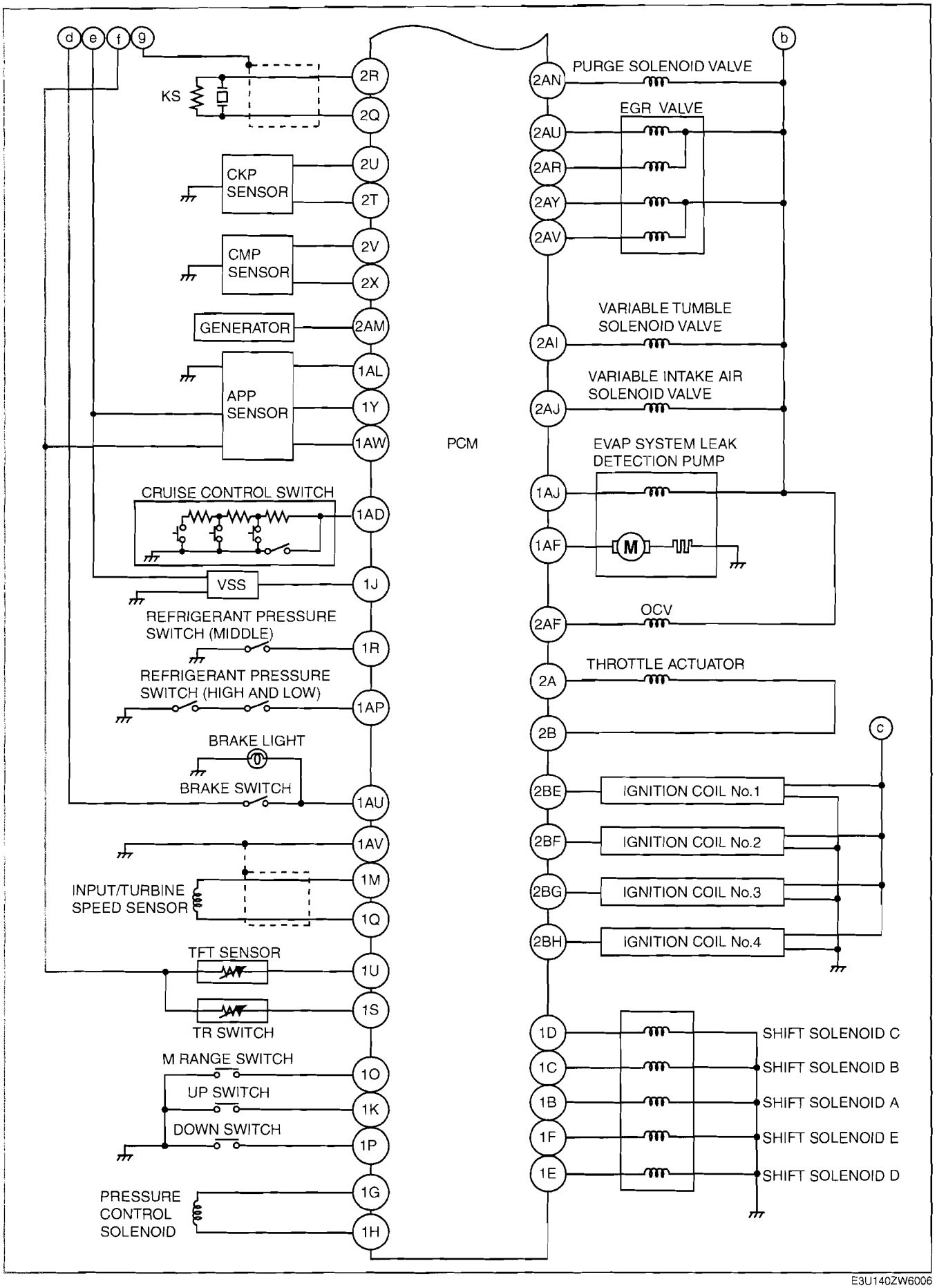


E3U140ZW6002

Except for California Emission Regulation Applicable Model



E3U140ZW6005

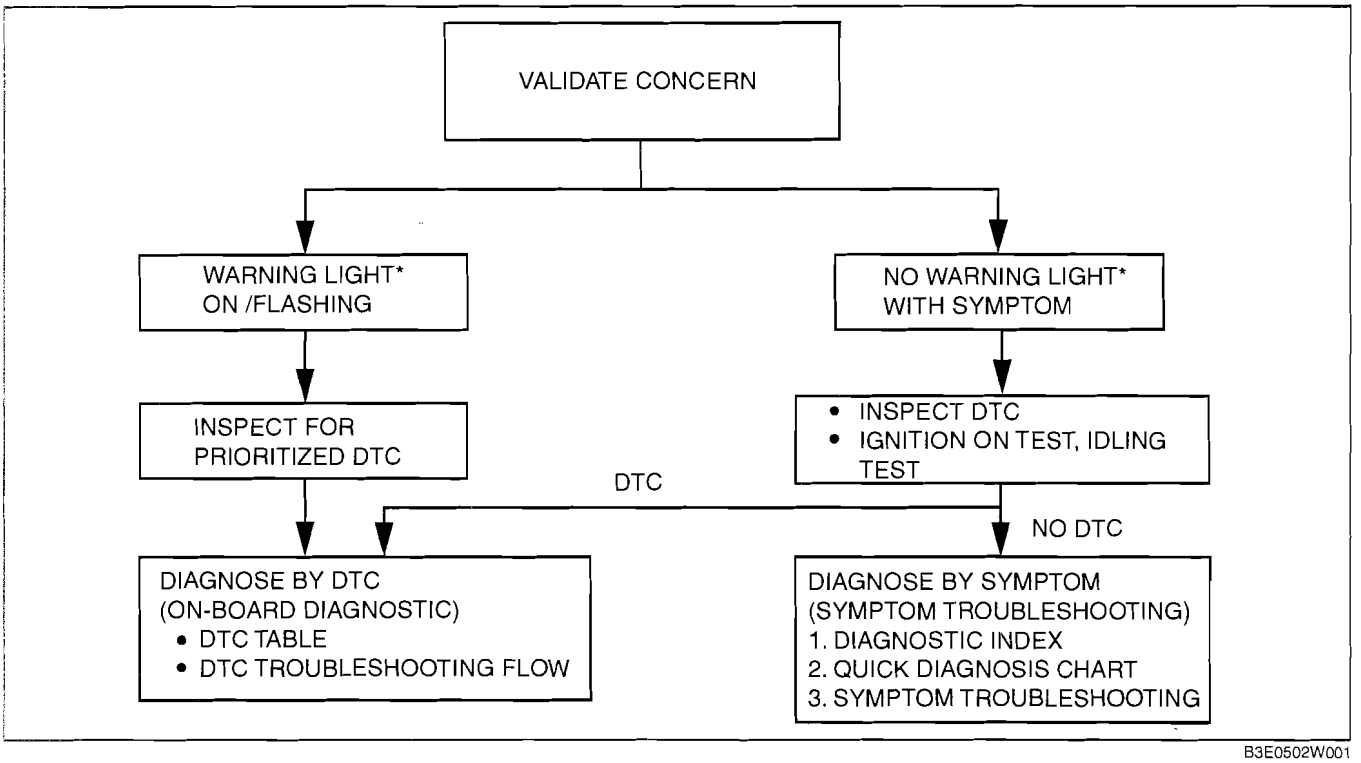


E3U140ZW6006

FOREWORD[FN4A-EL]

id0502a1800200

- When the customer reports a vehicle malfunction, inspect the malfunction indicator lamp (MIL), AT warning light indication, and PCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  — If a DTC exists, diagnose the applicable DTC. (See 05-02A-11 DTC TABLE[FN4A-EL].)
  — If no DTC exists, the MIL does not illuminate, and AT warning light does not illuminate. Diagnose the applicable symptom troubleshooting. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)



B3E0502W001

*: Malfunction indicator lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION[FN4A-EL]

id0502a1800300

DTC Reading Procedure

(See 01-02A-14 ON-BOARD DIAGNOSTIC TEST[LF, L3].)

AFTER REPAIR PROCEDURE[FN4A-EL]

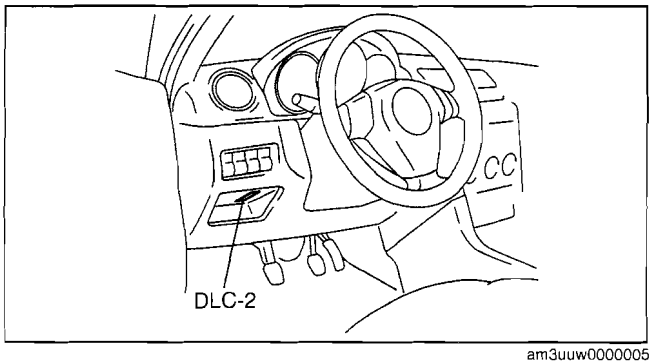
id0502a1800400

Caution

- **After repairing a malfunction, perform the following procedure to verify that the malfunction has been corrected.**
- **When performing this procedure, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "SelfTest".
  3. Select "Modules".
  4. Select "PCM".
  5. Select "Retrieve CMDTCs".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "PCM".
  3. Select "SelfTest".
  4. Select "Retrieve CMDTCs".



am3uuw0000005

3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Perform the following DTC inspections to ensure that the DTCs have been resolved:

DTC No.	inspection
P0706, P0707, P0708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **20 km/h {12 mph} or more** for **100 s or more**. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range at **20 km/h {12 mph} or more** for **100 s or more**. vii. Go to Step 6.
P0711	i. Start the engine then wait **180 s or more**. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **25 km/h {16 mph} or more** for **90 s or more**. iv. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Drive the vehicle in D range, at **25 km/h {16 mph} or more** for **90 s or more**. viii. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. ix. Go to Step 6.
P0712, P0713	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **20 km/h {12 mph} or more** for **150 s or more**. iv. Go to Step 6.
P0715	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **41 km/h {25 mph} or more** for **0.7 s or more**. iv. Go to Step 6.
P0720	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0731	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 1GR • Accelerator opening angle (APP PID): **3.07% or more** iv. Go to Step 6.
P0732	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 3 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 2GR iv. Go to Step 6.
P0733	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 3GR iv. Go to Step 6.
P0734	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {23 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 4GR iv. Go to Step 6.

DTC No.	inspection
P0741	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Go to Step 6.
P0742	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. iv. Go to Step 6.
P0745	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range. iv. Go to Step 6.
P0751	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.
P0752	i. Start the engine. ii. Warm up the engine and ATX. iii. Selector lever position: D range iv. Depress the brake pedal. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Selector lever position: D range viii. Depress the brake pedal. ix. Go to Step 6.
P0753, P0758, P0763, P0768, P0773, P0883, P1783	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR and TCC is operated. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR and TCC is operated. vii. Go to Step 6.

DTC No.	inspection
P0756	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0757, P0766	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR vii. Go to Step 6.
P0761	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Accelerator opening angle (APP PID): **3.07% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR vii. Go to Step 6.
P0762	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR vii. Go to Step 6.

DTC No.	inspection
P0767	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more**. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0771	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more**. • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR and TCC is operated iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more**. • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR and TCC is operated vii. Go to Step 6.
P0772	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): less than **70 km/h {43 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Accelerator conditions — Accelerator opening angle (APP PID) is **6.25% or more** and **5 s or more** have passed. — Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Accelerator opening angle is at closed throttle position and **5 s or more** have passed. vii. Go to Step 6.
P0894	i. Start the engine. ii. Warm up the engine and ATX. iii. Depress the brake pedal. iv. Throttle opening angle at closed throttle position. v. Shift the selector lever from the N position to the D range and hold for **3 s or more**. vi. Go to Step 7.

6. Gradually slow down and stop the vehicle.
7. Make sure that the repaired DTC does not recur.

DTC TABLE[FN4A-EL]

id0502a1800500

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
B1342	PCM malfunction	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0011	CMP timing over-advanced	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0012	CMP timing over-retarded	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0016	CKP-CMP correlation	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0030	Front HO2S heater control circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0031	Front HO2S heater circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0032	Front HO2S heater circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0037	Middle HO2S heater circuit low input*1 Rear HO2S heater circuit low input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0038	Middle HO2S heater circuit high input*1 Rear HO2S heater circuit high input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0043*1	Rear HO2S heater circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0044*1	Rear HO2S heater circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0069	Manifold absolute pressure/atmospheric pressure correlation	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0101	MAF sensor circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0102	MAF sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0103	MAF sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0107	MAP sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0108	MAP sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0111	IAT sensor circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0112	IAT sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0113	IAT sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0116	Engine coolant temperature circuit range/ performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0117	ECT sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0118	ECT sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0122	TP sensor No.1 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0123	TP sensor No.1 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0125	Excessive time to enter closed loop fuel control	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0126	Coolant thermostat stuck open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0128		(See 01-02A-22 DTC TABLE[LF, L3].)					
P0130*1	Front HO2 circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0131	Front HO2S circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0132	Front HO2S circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0133	Front HO2S circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0134	Front HO2S no activity detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0137*2	Rear HO2S circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0138	Middle HO2S circuit high input*1 Rear HO2S circuit high input*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0139	Middle HO2S circuit problem*1 Rear HO2S circuit problem*2	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0140*2	Rear HO2S no activity detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0144*1	Rear HO2S circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0171*1	Fuel trim system too lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0172*1	Fuel trim system too rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0222	TP sensor No.2 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0223	TP sensor No.2 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0300	Random misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0301	Cylinder No.1 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0302	Cylinder No.2 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0303	Cylinder No.3 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0304	Cylinder No.4 misfire detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0327	KS circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0328	KS circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0335	CKP sensor circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0340	CMP sensor circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0401	EGR flow insufficient detected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0403	EGR valve (stepper motor) circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0421	Warm up catalyst system efficiency below threshold	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0441	Evaporative emission control system incorrect purge flow	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0442	Evaporative emission control system leak detected (small leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0443	Purge solenoid valve circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0455	Evaporative emission control system leak detected (gross leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0456*1	Evaporative emission system leak detected (very small leak)	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0461	Fuel gauge sender unit circuit range/ performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0462	Fuel gauge sender unit circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0463	Fuel gauge sender unit circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0480	Fan control circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0500	VSS circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0505	IAC system problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0506	Idle control system RPM lower than expected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0507	Idle control system RPM higher than expected	(See 01-02A-22 DTC TABLE[LF, L3].)					
P050A	Cold start idle air control system performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P050B	Cold start ignition timing performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0564	Cruise control switch circuit malfunction	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0571	Brake switch circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0601	PCM memory check sum error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0602	PCM programming error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0604	PCM RAM error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0606	ECM/PCM processor	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0607*2	PCM performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0610	PCM vehicle options error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0638	Throttle actuator control range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0661	Variable intake air solenoid valve circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0662	Variable intake air solenoid valve circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0703	Brake switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0704	Clutch pedal position (CPP) switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0706	Transaxle range (TR) switch circuit range/ performance	ON	YES	2	CCM	X	(See 05-02A-17 DTC P0706[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	X	(See 05-02A-18 DTC P0707[FN4A-EL].)
P0708	Transaxle range (TR) switch circuit high input	ON	YES	1	CCM	X	(See 05-02A-20 DTC P0708[FN4A-EL].)
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	ON	NO	2	CCM	X	(See 05-02A-22 DTC P0711[FN4A-EL].)
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	X	(See 05-02A-24 DTC P0712[FN4A-EL].)
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	X	(See 05-02A-26 DTC P0713[FN4A-EL].)
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02A-28 DTC P0715[FN4A-EL].)
P0720	VSS circuit malfunction	ON	YES	2	CCM	X	(See 05-02A-31 DTC P0720[FN4A-EL].)
P0731	Gear 1 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-34 DTC P0731[FN4A-EL].)
P0732	Gear 2 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-36 DTC P0732[FN4A-EL].)
P0733	Gear 3 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-38 DTC P0733[FN4A-EL].)
P0734	Gear 4 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02A-40 DTC P0734[FN4A-EL].)
P0741	Torque converter clutch (TCC) (stuck off)	OFF	YES	1	CCM	X	(See 05-02A-42 DTC P0741[FN4A-EL].)
P0742	Torque converter clutch (TCC) (stuck on)	OFF	YES	1	CCM	X	(See 05-02A-44 DTC P0742[FN4A-EL].)
P0745	Pressure control solenoid malfunction	OFF	YES	1	CCM	X	(See 05-02A-46 DTC P0745[FN4A-EL].)
P0751	Shift solenoid A stuck off	ON	YES	2	CCM	X	(See 05-02A-48 DTC P0751[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0752	Shift solenoid A stuck on	ON	YES	2	CCM	X	(See 05-02A-50 DTC P0752[FN4A-EL].)
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-52 DTC P0753[FN4A-EL].)
P0756	Shift solenoid B stuck off	ON	YES	2	CCM	X	(See 05-02A-54 DTC P0756[FN4A-EL].)
P0757	Shift solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02A-56 DTC P0757[FN4A-EL].)
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-58 DTC P0758[FN4A-EL].)
P0761	Shift solenoid C stuck off	ON	YES	2	CCM	X	(See 05-02A-60 DTC P0761[FN4A-EL].)
P0762	Shift solenoid C stuck on	ON	YES	2	CCM	X	(See 05-02A-62 DTC P0762[FN4A-EL].)
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-64 DTC P0763[FN4A-EL].)
P0766	Shift solenoid D stuck off	ON	YES	2	CCM	X	(See 05-02A-66 DTC P0766[FN4A-EL].)
P0767	Shift solenoid D stuck on	OFF	YES	2	CCM	X	(See 05-02A-68 DTC P0767[FN4A-EL].)
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-70 DTC P0768[FN4A-EL].)
P0771	Shift solenoid E stuck off	ON	YES	2	CCM	X	(See 05-02A-72 DTC P0771[FN4A-EL].)
P0772	Shift solenoid E stuck on	ON	YES	2	CCM	X	(See 05-02A-74 DTC P0772[FN4A-EL].)
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02A-76 DTC P0773[FN4A-EL].)
P0850	Neutral switch input circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P0883	Battery voltage high	ON	YES	1	CCM	X	(See 05-02A-78 DTC P0883[FN4A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0894	Forward clutch torque transmission	OFF	YES	1	CCM	X	(See 05-02A-79 DTC P0894[FN4A-EL].)
P1260	Immobilizer system problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P1783	ATF high oil temperature malfunction	OFF	YES	1	CCM	X	(See 05-02A-80 DTC P1783[FN4A-EL].)
P2004	Variable tumble shutter valve stuck open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2006	Variable tumble shutter valve stuck closed	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2009	Variable tumble solenoid valve circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2010	Variable tumble solenoid valve circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2088	Oil control valve (OCV) circuit low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2089	Oil control valve (OCV) circuit high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2096	Target A/F feedback system too lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2097	Target A/F feedback system too rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2100*2	Throttle actuator circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2101	Throttle actuator circuit range/performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2102*2	Throttle actuator circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2103*2	Throttle actuator circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2107	Throttle actuator control module processor error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2108	Throttle actuator control module performance error	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2109*1	TP sensor minimum stop range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2112*1	Throttle actuator control system range/ performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2119	Throttle actuator control throttle body range/ performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2122	Accelerator pedal position (APP) sensor No.1 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2123	Accelerator pedal position (APP) sensor No.1 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2126	Accelerator pedal position (APP) sensor No.2 circuit range/performance problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2127	Accelerator pedal position (APP) sensor No.2 circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2128	Accelerator pedal position (APP) sensor No.2 circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2135	Throttle position sensor No.1/No.2 voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2138	Accelerator pedal position (APP) sensor No.1/ No.2 voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2177*2	Fuel system too lean at off idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2178*2	Fuel system too rich at off idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2187*2	Fuel system too lean at idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2188*2	Fuel system too rich at idle	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2195	Front HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2196	Front HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2228	BARO sensor circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2229	BARO sensor circuit high input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2237*2	Front HO2S positive current control circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2251*2	Front HO2S negative current control circuit open	(See 01-02A-22 DTC TABLE[LF, L3].)					

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P2270*1	Middle HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2271*1	Middle HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2274*1	Rear HO2S signal stuck lean	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2275*1	Rear HO2S signal stuck rich	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2401	EVAP system leak detection pump motor circuit low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2402	EVAP system leak detection pump motor circuit high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2404	EVAP system leak detection pump sense circuit problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2405	EVAP system leak detection pump sense circuit low input	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2407	EVAP system leak detection pump sense circuit intermittent	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2502	Charging system voltage problem	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2503	Charging system voltage low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2504	Charging system voltage high	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2507	PCM B+ voltage low	(See 01-02A-22 DTC TABLE[LF, L3].)					
P2610	PCM internal engine off timer performance	(See 01-02A-22 DTC TABLE[LF, L3].)					
U0073	CAN system communication error	(See 01-02A-22 DTC TABLE[LF, L3].)					
U0101	Communication error to PCM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					
U0121	Communication error to ABS HU/CM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					
U0155	Communication error to instrument cluster	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)					

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

DTC P0706[FN4A-EL]

id0502a1800900

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Engine speed **530 rpm or more** — Vehicle speed **20 km/h {12 mph} or more** — Voltage at PCM terminal 1AH*1/1S*2 **0.5 V or more** — P, R, N, or D range/position not detected **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

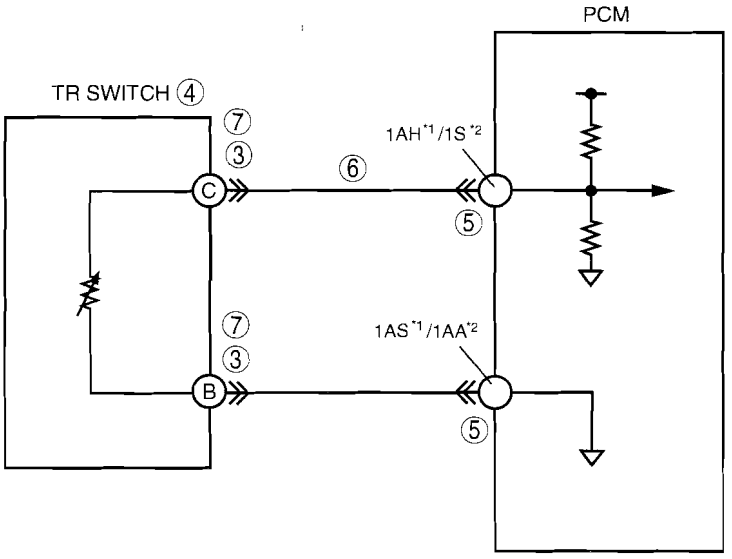
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Adjust or replace the TR switch, then go to the next step. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].) (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in each range (D and R) for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

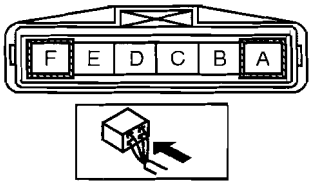
DTC P0707[FN4A-EL]

id0502a1801000

DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at PCM terminal 1AH*1/1S*2 **0.5 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Short to ground in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • TR switch signal and TR switch ground circuits shorted each other • PCM malfunction

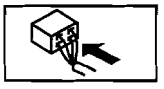


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

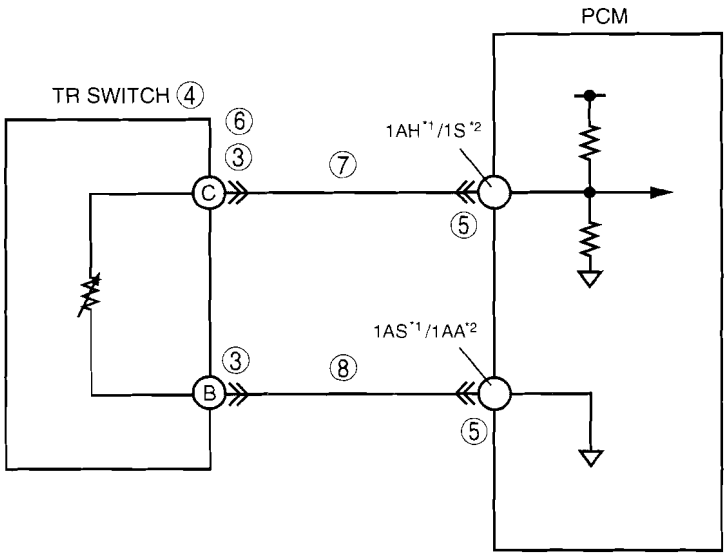
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection at TR switch terminals B and C (part-side) (such as damaged/pulled-out pins, corrosion) • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 8. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 8. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminals 1AH*1/1S*2 and 1AS*1/1AA*2 (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between TR switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT CIRCUIT** • Inspect for continuity between TR switch terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short circuit, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

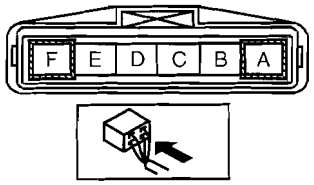
DTC P0708[FN4A-EL]

id0502a1801100

DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at PCM terminal 1AH*1/1S*2 **4.79 V or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Open circuit in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • Short to power supply in wiring harness between TR switch terminal C and PCM terminal 1AH*1/1S*2 • Open circuit in wiring harness between TR switch terminal B and PCM terminal 1AS*1/1AA*2 • Poor connection of TR switch or PCM connectors • PCM malfunction

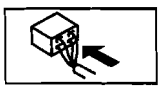


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 9. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
4	**INSPECT TR SWITCH** • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 9. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection at terminals 1AH*1/ 1S*2 and 1AS*1/1AA*2 (such as damaged/ pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to step 9.
		No	Go to the next step.
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between TR switch terminal C and (wiring harness-side) body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal C (wiring harness-side) and PCM terminal 1AH*1/1S*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to step 9.
8	**INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal B (wiring harness-side) and PCM terminal 1AS*1/1AA*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID) **530 rpm or more** — Vehicle speed (VSS PID) **20 km/h {12 mph} or more** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0711[FN4A-EL]

id0502a1801200

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	• When all conditions below are satisfied. — When **180 s or more** have passed after the engine is started, vehicle is driven for **90 s or more** at vehicle speed **25 km/h {16 mph} or more**, then **60 km/h {37 mph} or more** for **60 s or more**. — D range of TR switch input — Opened accelerator position — P0712, P0713 not output — Variation in ATF voltage **less than 0.03 V** • When the detected ATF temperature is **less than 20°C {68 °F}** together with the following conditions. — Intake air temperature is **-7 °C {19.4 °F} or more** after engine starts. — Estimated ATF temperature is **more than 55° C {131 °F}** while vehicle is driving. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • AT warning light does not illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/1U*2. • Record terminal 2AC*1/1U*2 voltage. • Start the engine. • Drive the vehicle at **60 km/h {37 mph} or more** for **330 s or more**. • Record terminal 2AC*1/1U*2 voltage again. • Is the variation in voltage **0.03 V or more**?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect terminals for corrosion. • Are terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to the next step.

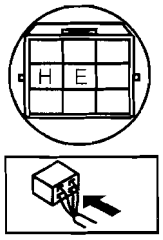
STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Decrease ATF temperature to **20 °C {68 °F} or less**. • Start the engine and wait for **180 s or more**. • Drive the vehicle at a vehicle speed **25 km/h {16 mph} or more** for **90 s or more**. • Drive the vehicle at a vehicle speed **60 km/h {37 mph} or more** for **60 s or more**. • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

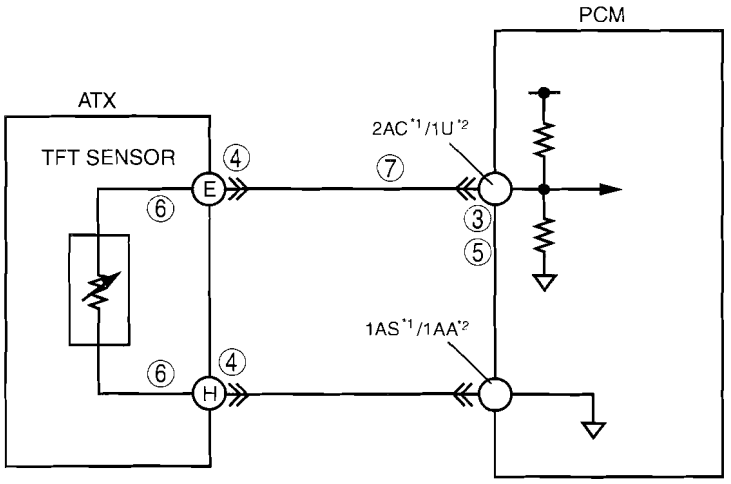
DTC P0712[FN4A-EL]

id0502a1801300

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• If the PCM detects either of the following conditions for **150 s or more**, the PCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **0.06 V or less** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Short to ground in wiring harness between TFT sensor and ATX terminal E • Short to ground in wiring harness between TFT sensor and ATX terminal H • Short to ground in wiring harness between ATX terminal E and PCM terminal 2AC*1/1U*2 • Damaged connectors between TFT sensor and PCM • PCM malfunction

TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR

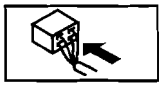




PCM WIRING HARNESS-SIDE CONNECTOR

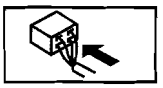
2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B

2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B

1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

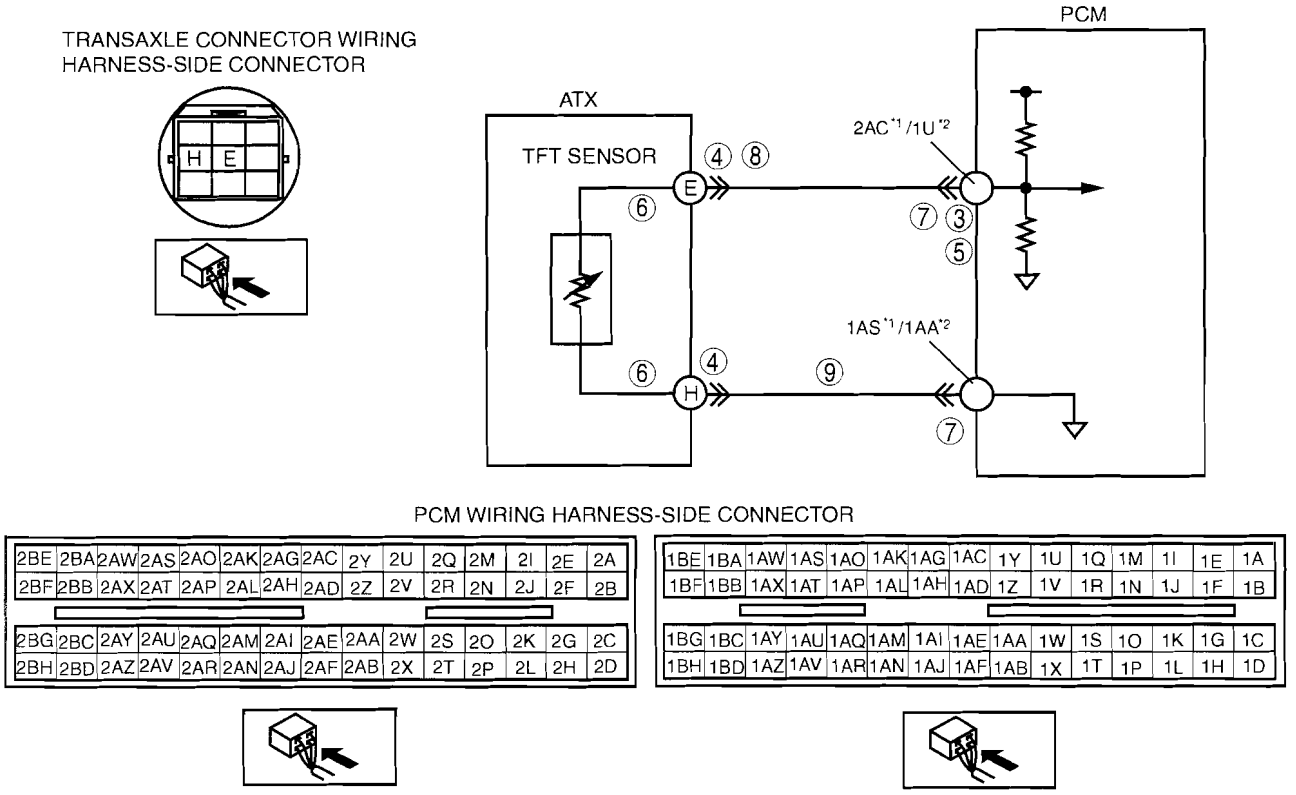
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at PCM terminal 2AC*1/1U*2. • Is the voltage **0.06 V or more**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Are the terminals bent?	Yes	Repair or replace the terminals, then go to Step 8. • If the terminals cannot be repaired, replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Verify that the voltage changes to **4.67 V or more** at PCM terminal 2AC*1/1U*2 when ATX connector is disconnected. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between ATX terminals (transaxle case side) and body ground. — E and body ground — H and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Replace the TFT sensor, then go to Step 8. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more.** • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0713[FN4A-EL]

id0502a1801400

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• If the PCM detects the following condition for **150 s or more**, the PCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **4.67 V or more** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit in wiring harness between TFT sensor and ATX terminal E • Open circuit in wiring harness between TFT sensor and ATX terminal H • Open circuit in wiring harness between ATX terminal E and PCM terminal 2AC*1/1U*2 • Open circuit in wiring harness between ATX terminal H and PCM terminal 1AS*1/1AA*2 • Damaged connectors between TFT sensor and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

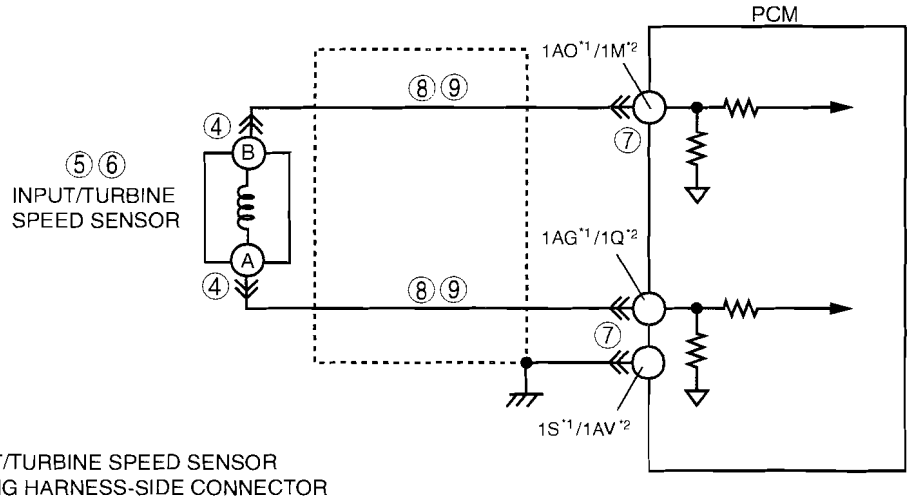
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/ 1U*2. • Is the voltage **below 4.67 V**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Inspect ATX connector connection. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at PCM terminal 2AC*1/ 1U*2 when connect between ATX terminals E and H (wiring harness-side) using jumper wire. • Verify that voltage changes to **0.06 V or less**. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between ATX terminals (transaxle case side) E and H. • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 10. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
		No	Repair or replace the wiring harness, then go to Step 10.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT WIRING HARNESS FOR OPEN CIRCUIT** • Disconnect the ATX connector. • Connect the PCM connector. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal E (vehicle wiring harness-side). • Is the voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal H (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

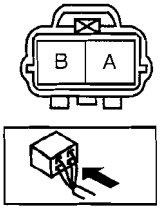
DTC P0715[FN4A-EL]

id0502a1806100

DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• When all conditions below are satisfied and **0.7 s or more** have passed. — D range of TR switch input — Driving vehicle at vehicle speed of **41 km/h {25 mph} or more** — Input/turbine speed sensor signal not input **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground in wiring harness between input/turbine speed sensor terminal A and PCM terminal 1AG*1/1Q*2 • Short to ground in wiring harness between input/turbine speed sensor terminal B and PCM terminal 1AO*1/1M*2 • Open circuit in wiring harness between input/turbine speed sensor terminal A and PCM terminal 1AG*1/1Q*2 • Open circuit in wiring harness between input/turbine speed sensor terminal B and PCM terminal 1AO*1/1M*2 • Damaged connectors between input/turbine speed sensor and PCM • PCM malfunction

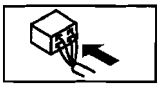


INPUT/TURBINE SPEED SENSOR
WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

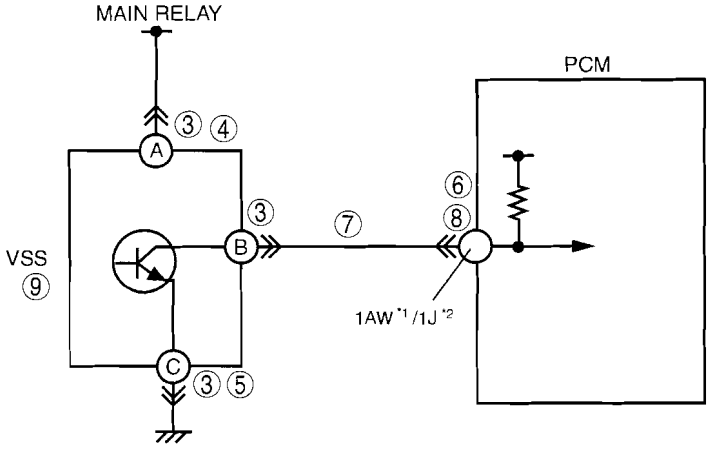
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the LOCK position. • Start the engine. • Measure the frequency of input/turbine speed sensor using a oscilloscope. — IG ON: **0 Hz** — Idle: **Within 320—374 Hz** (P, N position) • Are frequencies of input/turbine speed sensor within specifications?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the input/turbine speed sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between the input/ turbine speed sensor terminals (part-side). • Is the resistance **within 250—600 ohms** between input/turbine speed sensor terminals (part-side)? (See 05-17A-20 INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Replace the input/turbine speed sensor, then go to Step 10. (See 05-17A-21 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
6	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove the input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See 05-17A-21 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL].)	Yes	Clean the input/turbine speed sensor, then go to Step 10.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect the following input/turbine speed sensor terminals (wiring harness-side) and PCM terminals (wiring harness-side): — A and 1AG[*1]/1Q[*2] — B and 1AO[*1]/1M[*2] • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal (wiring harness-side) and body ground. — A and body ground — B and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle a vehicle speed **41 km/h {25 mph} or more** for **0.7 s or more**. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

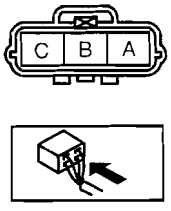
DTC P0720[FN4A-EL]

id0502a1809800

DTC P0720	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Vehicle speed signal is not input after the following conditions are met and **4.5 s or more** have passed: — D range switch ON — Engine coolant temperature **60 °C {140 °F} or more** — Turbine speed **1,500 rpm or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA is available. • AT warning light illuminates. • DTC is stored in the PCM memory.
POSSIBLE CAUSE	• VSS malfunction • Open circuit between VSS terminal B and PCM terminal 1AW*1/1J*2 • Short to ground between VSS terminal B and PCM terminal 1AW*1/1J*2 • Open circuit between VSS terminal A and main relay • Open circuit between VSS terminal C and body ground • Damaged connectors between VSS and PCM • PCM malfunction

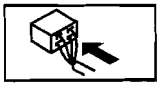


VSS WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the VSS connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that VSS connector is disconnected. • Turn ignition switch to ON (engine off). • Inspect the voltage between VSS terminal A (harness-side) and ground. • Is voltage reading **B+**?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
5	**INSPECT VSS GROUND CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Verify that VSS connector is disconnected. • Inspect for continuity between VSS terminal C (harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
7	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the PCM connector and VSS connector. • Inspect for continuity between VSS terminal B and PCM terminal 1AW*1/1J*2. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 11.
8	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that VSS connector and PCM connector are disconnected. • Inspect for continuity between PCM harness side connector and body ground. • Is there continuity?	Yes	Repair or replace the harness, then go to Step 11.
		No	Go to the next step.
9	**INSPECT VEHICLE SPEEDOMETER SENSOR** • Inspect VSS. (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL].) • Is VSS normal?	Yes	Go to the next step.
		No	Repair or replace the VSS, then go to Step 11.
10	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear DTC from memory using M-MDS. • Warm up engine. • Drive vehicle under following conditions for **4.5 s or more** while monitoring PIDs. — Engine coolant temp: **60 °C {140 °F} or more** — Drive in M range — Frequency of input/turbine speed sensor: **800 Hz or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0731[FN4A-EL]

id0502a1801900

DTC P0731	Gear 1 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors the revolution ratio of the forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or less**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Accelerator opening angle **3.07% or more** — Differential gear case (output) revolution speed **35 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Pressure control solenoid stuck • Line pressure low • One-way clutch slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID A** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A when applying B+ to transaxle terminal A. • Was a click heard from solenoid?	Yes	Go to the next step.
		No	Replace the solenoid that you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **20 km/h {12 mph}** — Drive in the D range, 1GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,100 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0731** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 1GR — Accelerator opening angle (APP PID): **3.07% or more** — Vehicle speed (VSS PID): **4 km/h {3 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0732[FN4A-EL]

id0502a1802000

DTC P0732	Gear 2 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is **1.249 or less** or **2.157 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 2 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID A, B AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A, B, and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **40 km/h {24 mph}** — Drive in the D range, 2GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,156 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 2GR — Vehicle speed (VSS PID): **3.8 km/h {2.4 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0733[FN4A-EL]

id0502a1802100

DTC P0733	Gear 3 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.863 or less**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 1.345—1.644**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **23 km/h {14.3 mph} or more** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A or C stuck • Pressure control solenoid stuck • Line pressure low • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass, TCC or 3-4 shift valve) • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.

STEP	INSPECTION		ACTION
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECTION SHIFT SOLENOID A AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoid A and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **60 km/h {37 mph}** — Drive in the D range, 3GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0733** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 2 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 3GR — Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0734[FN4A-EL]

id0502a1802200

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The PCM monitors revolution ratio of the forward clutch drum revolution to the differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.6 or less** or **1.249 or more**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 4 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **36 km/h {23 mph} or more** — Closed accelerator position — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 • The PCM monitors revolution ratio of the forward clutch drum revolution to the differential gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 0.91—1.09**, the PCM determines that there is a malfunction. **Monitoring condition:** — ATF temperature **20 °C {68 °F} or more** — Driving in 4 GR in D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **46 km/h {29 mph} or more** — Torque converter clutch (TCC) no operating — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass or 3-4 shift valve) • Oil pump malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the transaxle, then go to Step 8.

STEP	INSPECTION		ACTION
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8.
4	**INSPECT SHIFT SOLENOID A AND D FOR CLICK SOUND** • Perform operation inspection. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) • Verify the click sound of shift solenoids A and D when applying B+ to each transaxle terminal. **Note** • The click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 8. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the control valve body, then go to Step 8. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Accelerator opening angle (APP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,200 Hz**?	Yes	Go to the next step.
		No	Replace the control valve body, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
8	**VERIFY REPAIR OF DTC P0734** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 1 s**: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR — Accelerator opening angle (APP PID): **0%** — Vehicle speed (VSS PID): **46 km/h {29 mph} or more** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0741[FN4A-EL]

id0502a1807900

DTC P0741	Torque converter clutch (TCC) stuck off
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — Torque converter clutch (TCC) operating — Shift solenoid A duty value exceeds **99%** — Difference between engine speed and turbine speed **more than 100 rpm** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck. • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions for **10 s or more**. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC operation) — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0742[FN4A-EL]

id0502a1808000

DTC P0742	Torque converter clutch (TCC) stuck on
DETECTION CONDITION	• All of the following conditions are satisfied under each of the following accelerator conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **less than 70 km/h {43 mph}** — Torque converter clutch (TCC) no operating — Difference between engine speed and turbine speed **less than 50 rpm** — DTC P0734 not output — Accelerator conditions • Accelerator opening angle (APP PID) is **more than 6.25%** and **5 s or more** have passed. • Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed. • Accelerator opening angle is at closed accelerator position and **5 s or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the ATX, then go to Step 6. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

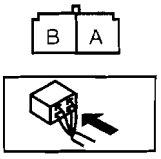
STEP	INSPECTION		ACTION
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC not in operation) — Vehicle speed: **less than 70 km/h {43 mph}**. — Accelerator conditions • Accelerator opening angle (APP PID) **more than 6.25%** and **5 s or more** have passed. • Accelerator opening angle (APP PID) **within 3.13—6.25%** and **3 s or more** have passed. • Accelerator opening angle at closed accelerator position and **5 s or more** have passed. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0745[FN4A-EL]

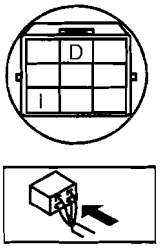
id0502a1806600

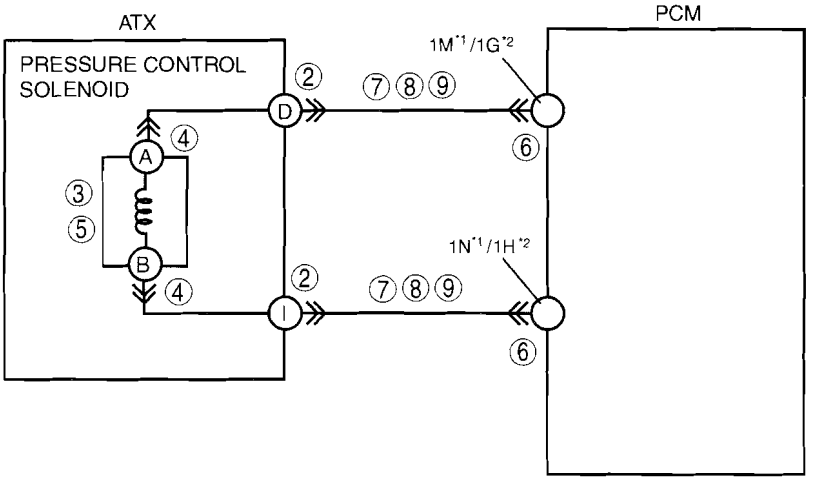
DTC P0745	Pressure control solenoid malfunction
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that pressure control solenoid circuit has a malfunction. — Pressure control solenoid voltage stuck **0 V** after engine start — Pressure control solenoid voltage stuck **B+** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if PCM detects above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Pressure control solenoid malfunction • Open circuit in wiring harness between pressure control solenoid terminal B and ATX terminal I • Open circuit in wiring harness between ATX terminal I and PCM terminal 1N*1/1H*2 • Short to ground in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Short to power supply in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Open circuit in wiring harness between pressure control solenoid terminal A and ATX terminal D • Open circuit in wiring harness between ATX terminal D and PCM terminal 1M*1/1G*2 • Damaged connector between pressure control solenoid and PCM • PCM malfunction

PRESSURE CONTROL SOLENOID WIRING HARNESS-SIDE CONNECTOR



TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
3	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminals D and I (transaxle case side). • Is the resistance **within 2.4—7.3 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 6.
		No	Go to the next step.
4	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT RESISTANCE** • Inspect the resistance between the pressure control solenoid terminals A and B. • Is the resistance **within 2.4—7.3 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 10.
		No	Verify pressure control solenoid installation. • If solenoid installed correctly, replace the pressure control solenoid, then go to Step 10. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
6	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
7	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the PCM (wiring harness-side) and ATX connector (wiring harness-side). — PCM terminal 1M*1/1G*2 and ATX terminal D — PCM terminal 1N*1/1H*2 and ATX terminal I • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, the go to Step 10.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal D (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between ATX terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Make sure to wait **more than 1 s** after turning the ignition switch to the ON position. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0751[FN4A-EL]

id0502a1808100

DTC P0751	Shift solenoid A stuck off
DETECTION CONDITION	• When P0731, P0732, and P0733 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225— 4,987 rpm** — Vehicle speed **46 km/h {29 mph} or more** — Differential gear case (output) revolution speed **35 rpm or more** — Torque converter clutch (TCC) not operating — Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.91—1.09** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0752[FN4A-EL]

id0502a1808200

DTC P0752	Shift solenoid A stuck on
DETECTION CONDITION	• When P0734 is not output, and all conditions below are satisfied in 1GR and 2GR. — ATF temperature **20 °C {68 °F} or more** — Engine running — D range selected — Brake pedal depressed — Accelerator opening angle at closed accelerator position — Vehicle speed **0 km/h {0 mph}** — Input/turbine speed sensor signal **187.5 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

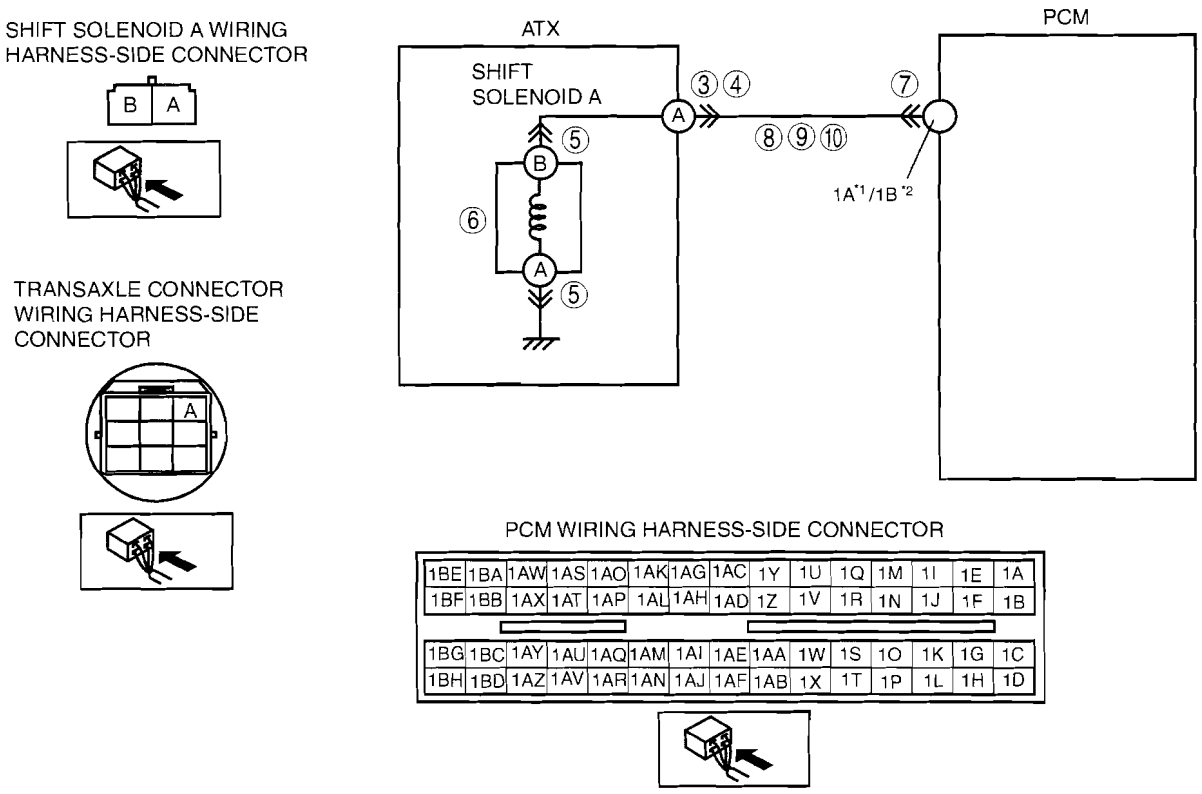
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0753[FN4A-EL]

id0502a1808300

DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions, PCM determines that shift solenoid A circuit has a malfunction. — Shift solenoid A voltage stuck at **B+** after engine start — Shift solenoid A voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Short to ground in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Short to power supply in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Open circuit in wiring harness between shift solenoid A terminal B and ATX terminal A • Open circuit in wiring harness between ATX terminal A and PCM terminal 1A*1/1B*2 • Open circuit in wiring harness between shift solenoid A terminal A and body ground • Damaged connector between shift solenoid A and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal A (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid A connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid A terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid A installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1A*1/1B*2 (wiring harness-side) and ATX terminal A (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal A (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1A*1/1B*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0756[FN4A-EL]

id0502a1808400

DTC P0756	Shift solenoid B stuck off
DETECTION CONDITION	• When DTC P0732, P0733, and P0734 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — Accelerator opening angle (APP PID) **3.07% or more** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **300 rpm or more** — Accelerator opening angle (APP PID): **3.07% or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0757[FN4A-EL]

id0502a1808500

DTC P0757	Shift solenoid B stuck on
DETECTION CONDITION	• When DTC P0731 and P0733 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 2GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **1.249 or less** or **2.157 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied with driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Vehicle speed **36 km/h {22 mph}** • Accelerator opening angle at closed accelerator position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.6 or less** or **1.249 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

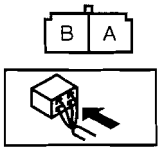
STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **300 rpm or more** — Accelerator opening angle (APP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **36 km/h {22 mph} or more** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0758[FN4A-EL]

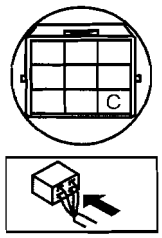
id0502a1808600

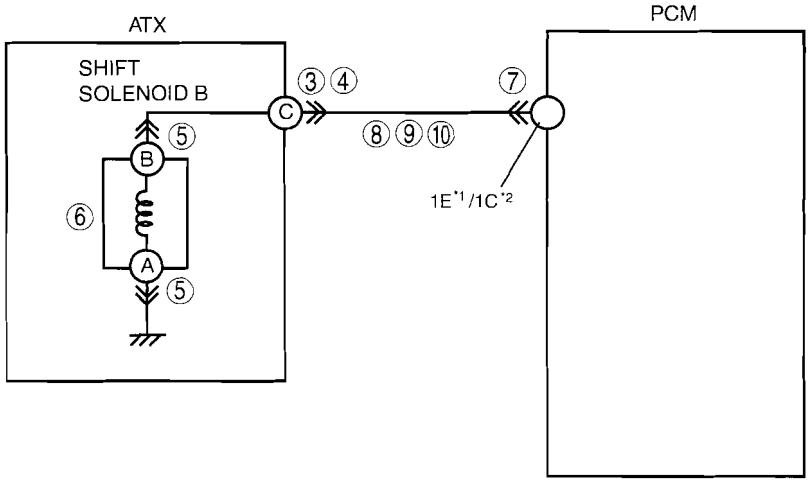
DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that shift solenoid B circuit has a malfunction. — Shift solenoid B voltage stuck at **B+** after engine start — Shift solenoid B voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Short to ground in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Short to power supply in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Open circuit in wiring harness between shift solenoid B terminal B and ATX terminal C • Open circuit in wiring harness between ATX terminal C and PCM terminal 1E*1/1C*2 • Open circuit in wiring harness between shift solenoid B terminal A and body ground • Damaged connector between shift solenoid B and PCM • PCM malfunction

SHIFT SOLENOID B WIRING HARNESS-SIDE CONNECTOR

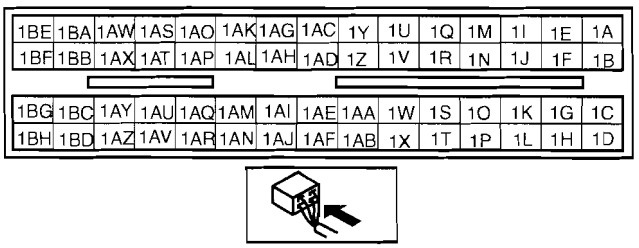


TRANSAXLE CONNECTOR WIRING HARNESS-SIDE CONNECTOR





PCM WIRING HARNESS-SIDE CONNECTOR



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal C (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid B connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid B terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid B installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1E*1/1C*2 (wiring harness-side) and ATX terminal C (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect for voltage at ATX terminal C (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1E*1/1C*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0761[FN4A-EL]

id0502a1808700

DTC P0761	Shift solenoid C stuck off
DETECTION CONDITION	• When DTC P0733 and P0734 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 2GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **1.249 or less** or **2.157or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that the gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Accelerator opening angle (APP PID): **3.07% or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0762[FN4A-EL]

id0502a1808800

DTC P0762	Shift solenoid C stuck on
DETECTION CONDITION	• When DTC P0731 and P0732 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 3GR. • ATF temperature **20 °C {68 °F} or more**. • Driving in D range • Engine running • Turbine speed **within 225—4,987 rpm** • Vehicle speed **23 km/h {14.3 mph} or more** • Torque converter clutch (TCC) no operating • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 1.345—1.644** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C and pressure control solenoid stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

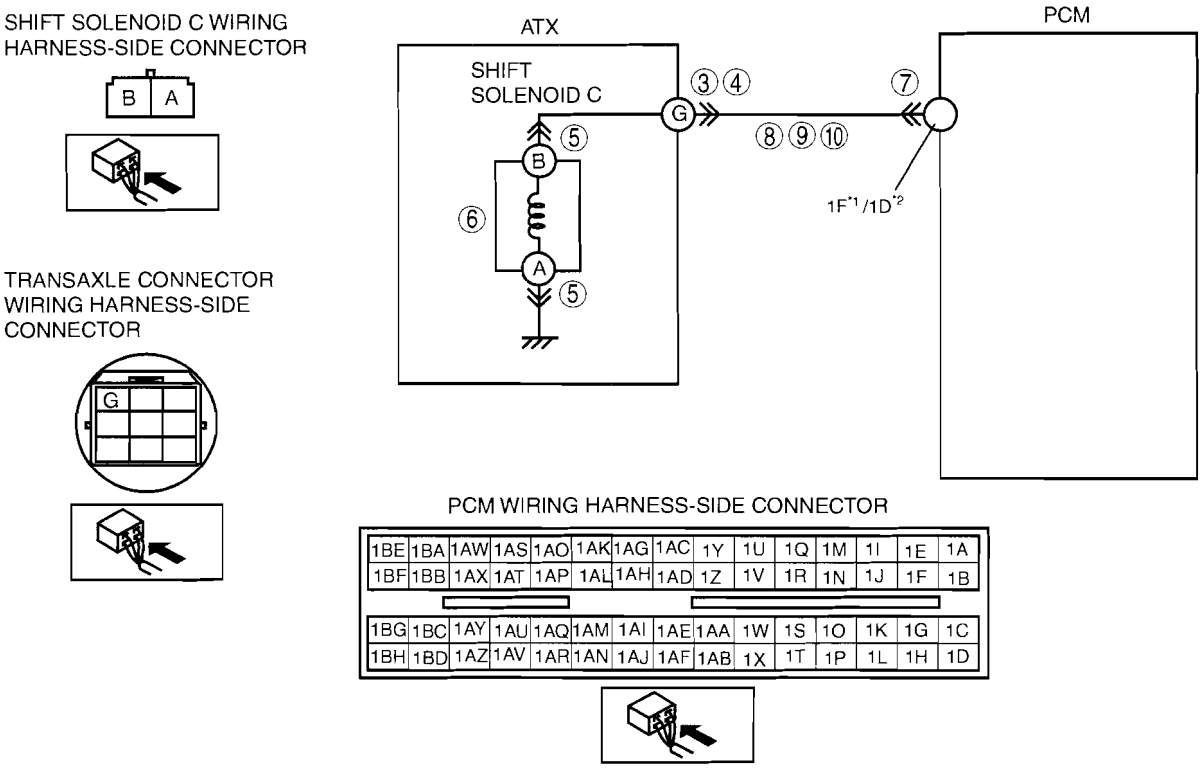
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **23 km/h {14.3 mph} or more** • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0763[FN4A-EL]

id0502a1808900

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	• If the PCM detects either of the following conditions, the PCM determines that shift solenoid C circuit has a malfunction. — Shift solenoid C voltage stuck at **B+** after engine start — Shift solenoid C voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Short to ground in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Short to power supply in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Open circuit in wiring harness between shift solenoid C terminal B and ATX terminal G • Open circuit in wiring harness between ATX terminal G and PCM terminal 1F*1/1D*2 • Open circuit in wiring harness between shift solenoid C terminal A and body ground • Damaged connector between shift solenoid C and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal G (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid C connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid C terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid C installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1F*1/1D*2 (wiring harness-side) and ATX terminal G (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal G (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1F*1/1D*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0766[FN4A-EL]

id0502a1809000

DTC P0766	Shift solenoid D stuck off
DETECTION CONDITION	• When any of DTC P0732, and P0733 not output (correct judgment), and all conditions below are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Differential gear case (output) revolution speed **35 rpm or more** • Vehicle speed **36 km/h {23 mph} or more** • Accelerator opening angle at closed accelerator position • Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.6 or less** or **1.249 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature: **20 °C {68 °F} or more** — Drive in the M range — Accelerator opening angle (APP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **36 km/h {23 mph} or more** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0767[FN4A-EL]

id0502a1809100

DTC P0767	Shift solenoid D stuck on
DETECTION CONDITION	• When any of DTC P0731, P0732, P0734, and P0741 are not output, and all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 3GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — Revolution ratio of forward clutch drum revolution to differential gear case revolution **0.863 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

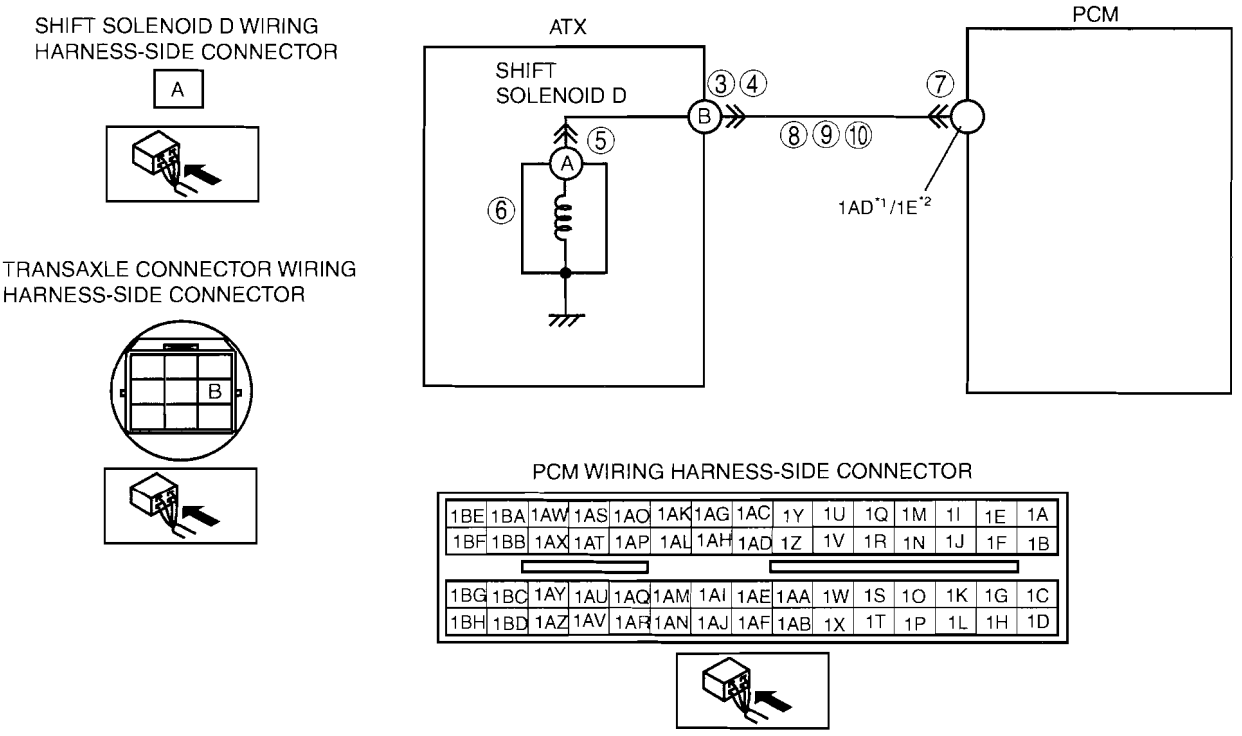
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range, 3GR • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0768[FN4A-EL]

id0502a1807000

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions while driving in 4GR at D range, the PCM determines that shift solenoid D circuit has a malfunction. — Shift solenoid D voltage stuck at **B+** after engine start — Shift solenoid D voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid D malfunction • Short to ground in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Short to power supply in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Open circuit in wiring harness between shift solenoid D terminal A and ATX terminal B • Open circuit in wiring harness between ATX terminal B and PCM terminal 1AD*1/1E*2 • Damaged connector between shift solenoid D and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal B (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid D connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid D terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid D installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1AD*1/1E*2 (wiring harness-side) and ATX terminal B (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal B (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1AD*1/1E*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	No concern is detected. Go to the next step.

STEP	INSPECTION		ACTION
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0771[FN4A-EL]

id0502a1809200

DTC P0771	Shift solenoid E stuck off
DETECTION CONDITION	• When any of P0732, and P0734 are not output, and all conditions below are satisfied. — When all conditions below are satisfied while driving in 1GR • ATF temperature **20 °C {68 °F} or more** • Driving in M range • Engine running • Turbine speed **within 225—4,987 rpm** • Accelerator opening angle (APP PID) **3.07% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to differential gear case revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 — When all conditions below are satisfied while driving in 4GR • ATF temperature **20 °C {68 °F} or more** • Driving in D range • Engine running • Turbine speed **within 225—4,987 rpm** • Vehicle speed **within 60—100 km/h {37—62 mph}** • Torque converter clutch (TCC) operating • Shift solenoid A duty value exceeds **99%** • Difference between engine speed and turbine speed **more than 100 rpm** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the M range — Vehicle speed: **within 60—100 km/h {37—62 mph}** (4GR only). • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0772[FN4A-EL]

id0502a1809300

DTC P0772	Shift solenoid E stuck on
DETECTION CONDITION	• When any of DTC P0731, P0733, and P0734 are not output, and all of the following conditions are satisfied under each of the following accelerator conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **less than 70 km/h {43 mph}** — Torque converter clutch (TCC) no operating — Difference between engine speed and turbine speed **50 rpm or less** — Accelerator conditions • Accelerator opening angle (APP PID) is **more than 6.25%** and **5 s or more** have passed • Accelerator opening angle (APP PID) is **within 3.13—6.25%** and **3 s or more** have passed • Accelerator opening angle is at closed accelerator position and **5 s or more** have passed **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck • Control valve stuck • PCM malfunction

Diagnostic procedure

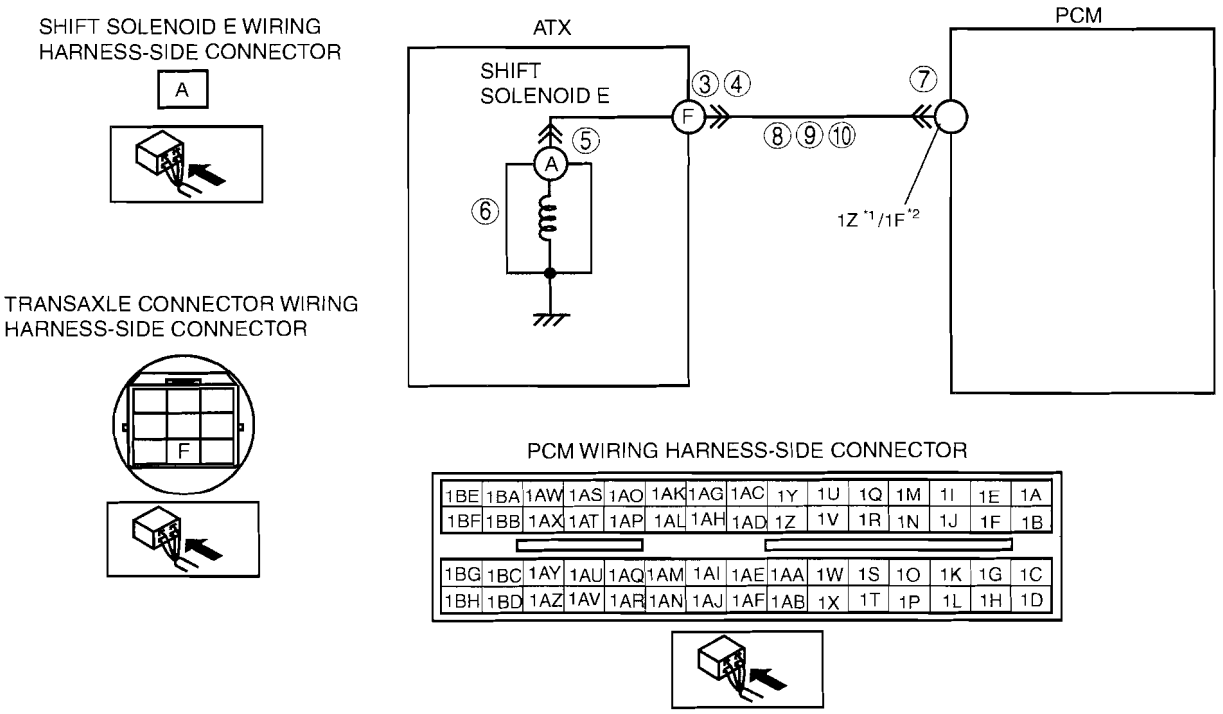
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the ATX, then go to Step 7. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the control valve body. • Disassemble the control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)	Yes	Replace the ATX, then go to the next step. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	**VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature: **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **less than 70 km/h {43 mph}** (4GR only) • Is the PENDING CODE present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0773[FN4A-EL]

id0502a1809400

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	• If PCM detects either of the following conditions while driving in 4GR at D range with TCC operating, PCM determines that shift solenoid E circuit has a malfunction. — Shift solenoid E voltage stuck at **B+** after engine start — Shift solenoid E voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Shift solenoid E malfunction • Short to ground in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Short to power supply in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Open circuit in wiring harness between shift solenoid E terminal A and ATX terminal F • Open circuit in wiring harness between ATX terminal F and PCM terminal 1Z*1/1F*2 • Damaged connector between shift solenoid E and PCM • PCM malfunction



*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATX CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the ATX connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between ATX terminal F (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid E connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid E terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid E installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	**INSPECT PCM CONNECTOR FOR POOR CONNECTION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT ATX CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PCM terminal 1Z*1/1F*2 (wiring harness-side) and ATX terminal F (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at ATX terminal F (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT PCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between PCM terminal 1Z*1/1F*2 (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0883[FN4A-EL]

id0502a1802900

DTC P0883	Battery voltage high
DETECTION CONDITION	• Voltage of **16 V or more** detected at PCM terminal 1BE. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Generator malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY DTC** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTC in the PCM memory. • Are DTC P2504 output?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0883 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P0894[FN4A-EL]

id0502a1809600

DTC P0894	Forward clutch power transmission malfunction
DETECTION CONDITION	• With the engine running and the selector lever in the D or M range, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Vehicle speed **0 km/h {0 mph}** (brake on) — Even when **3 s or more** has passed since the engine has started, the turbine speed will not decrease to **less than 187.5 rpm**. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • DTCs are stored in the PCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and PCM terminal 1A*1/1B*2 • Shift solenoid A stuck on • VSS malfunction • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTCs in the PCM memory. • Are DTCs P0500, P0752, and P0753 output?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	Replace the forward clutch, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0894 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up the engine. • With the selector lever in the D range and the vehicle stopped (brake on), wait **3 s or more**. • Are any DTCs present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

DTC P1783[FN4A-EL]

id0502a1807700

DTC P1783	ATF high oil temperature malfunction
DETECTION CONDITION	• When all conditions below are satisfied. — P0712, P0713 not output — ATF temperature **149.5 °C {301°F} or more** — ATF oil temperature signal of **0.06 V or more** is input to PCM terminal 2AC*1/1U*2. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the PCM detects above malfunction conditions during the first drive cycle. • The PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• High engine load drive (Driving a steep gradient at a low speed.) • Insufficient or excess level of ATF • Deteriorated ATF • TFT sensor circuit malfunction • PCM malfunction

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Diagnostic procedure

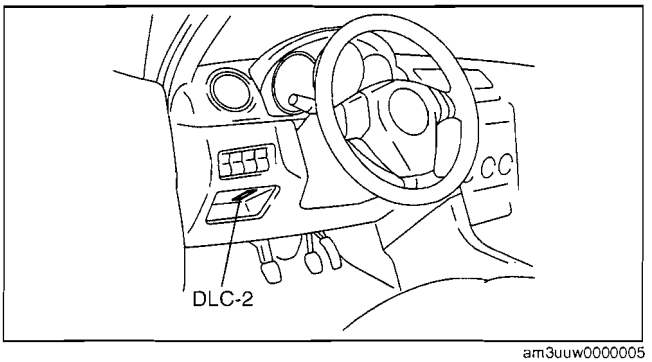
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY VEHICLE DRIVING CONDITIONS** • Verify each PID monitor of the HTM_CNT and HTM_DIS. • Verify vehicle driving conditions when a DTC P1783 is output. • Has the vehicle been driven at a high engine load?	Yes	• Go to Step 6. • Inform the customer that the ATX temperature is high due to high engine load driving.
		No	Go to the next step.
4	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 6. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
5	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to the next step. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
6	**VERIFY TROUBLESHOOTING OF DTC P1783 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Is the same DTC present?	Yes	Replace the PCM, then go to the next step. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02A-6 AFTER REPAIR PROCEDURE[FN4A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
		No	DTC troubleshooting completed.

PID/DATA MONITOR INSPECTION[FN4A-EL]

id0502a1805600

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "PCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "PCM".
     3. Select "DataLogger".
3. Select the PID from the PID table
4. Verify the PID data according to the directions on the M-MDS screen.



am3uuw0000005

Note
- Perform part inspection for the output device after PCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using methods such as the simulation function.

PID/DATA MONITOR AND RECORD function table

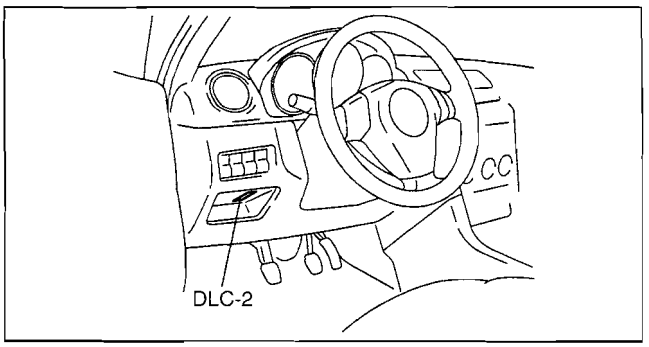
Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
DWN SW (Down switch)	On/Off	• M range, downshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AF*1/1P*2
GEAR	1/2/3/4	1GR: 1 2GR: 2 3GR: 3 4GR: 4	Inspect the following PIDs: SSA/SS1, SSB/SS2, SSC/SS3, SSD/SS4, SSE_SS5	N/A
HTM_CNT	N/A	Indicates number of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) operations • 0—65,535	N/A	N/A
HTM_DIS	km	Indicates travel distance after operation of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) • 0—65,535 km	N/A	N/A
LINEDES	Pa	Indicates target line pressure	Inspect the following PIDs: APP, OSS, TFT, TFTV, TR, TSS, VPWR, VSS	N/A
LPS (Pressure control solenoid)	A	Change current value according to accelerator opening angle	Inspect the pressure control solenoid. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1M*1, 1N*1/ 1G*2, 1H*2
MNL SW (M range switch)	On/Off	M range: On Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AN*1/1O*2

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	PCM terminal
OSS (Output shaft speed)	RPM	Indicates output shaft speed	Inspect the VSS. (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL].)	1AW*1/1J*2
SSA/SS1 (Shift solenoid A)	%	4GR: **99%** Others: **0%**	Inspect the shift solenoid A. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1A*1/1B*2
SSB/SS2 (Shift solenoid B)	%	1GR at D range: **99%** Others: **0%**	Inspect the shift solenoid B. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1E*1/1C*2
SSC/SS3 (Shift solenoid C)	%	1GR/2GR: **99%** Others: **0%**	Inspect the shift solenoid C. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1F*1/1D*2
SSD/SS4 (Shift solenoid D)	On/Off	• P/N position, 4GR at D range, 1GR at M range: On • Others: Off	Inspect the shift solenoid D. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1AD*1/1E*2
SSE_SS5 (Shift solenoid E)	On/Off	• TCC operating: On • TCC non operating: Off	Inspect the shift solenoid E. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].)	1Z*1/1F*2
TFT (Transaxle fluid temperature)	°C	Indicates transaxle fluid temperature	Inspect the TFT sensor. (See 05-17A-18 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL].)	2AC*1/1U*2
TFTV (Transaxle fluid signal voltage)	V	ATF **20 °C {68 °F}: Approx. 3.3 V** ATF **40 °C {104 °F}: Approx. 2.4 V** ATF **60 °C {140 °F}: Approx. 1.5 V**	Inspect the TFT sensor. (See 05-17A-18 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL].)	2AC*1/1U*2
THOP (Throttle position sensor)	%	• CTP: **12%** • WOT: **75%**	Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].)	N/A
TR (Transaxle range)	P/R/N/D	P position: P R position: R N position: N D range: D	Inspect the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	1AH*1/1S*2
TR_SENS (TR switch)	V	P position: **4.34—4.79 V** R position: **3.83—4.18 V** N position: **3.05—3.50 V** D range: **2.23—2.66 V**	Inspect the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)	1AH*1/1S*2
TSS (Input/turbine speed)	RPM	Ignition switch ON: **0 RPM** Idle: **700—800 RPM** (P, N position) Indicates Input/turbine speed	Inspect the input/turbine speed sensor. (See 05-17A-20 INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL].)	1AG*1, 1AO*1/ 1M*2, 1Q*2
UP SW (Up switch)	On/Off	• M range, upshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	1AJ*1/1K*2

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

Simulation Function Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "DataLogger".
     - — Select "Modules".
     - — Select "PCM".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "PCM".
     - — Select "DataLogger".
3. Select the simulation items from the PID table.
4. Perform the simulation function, inspect the operations for each parts.
   - If there is no operation sound from the solenoid after the simulation function inspection is performed, it is possible that there is an open or short circuit in the wiring harness, or solenoid, or sticking and operation malfunction.



am3uuw0000005

Simulation item table

X: Available

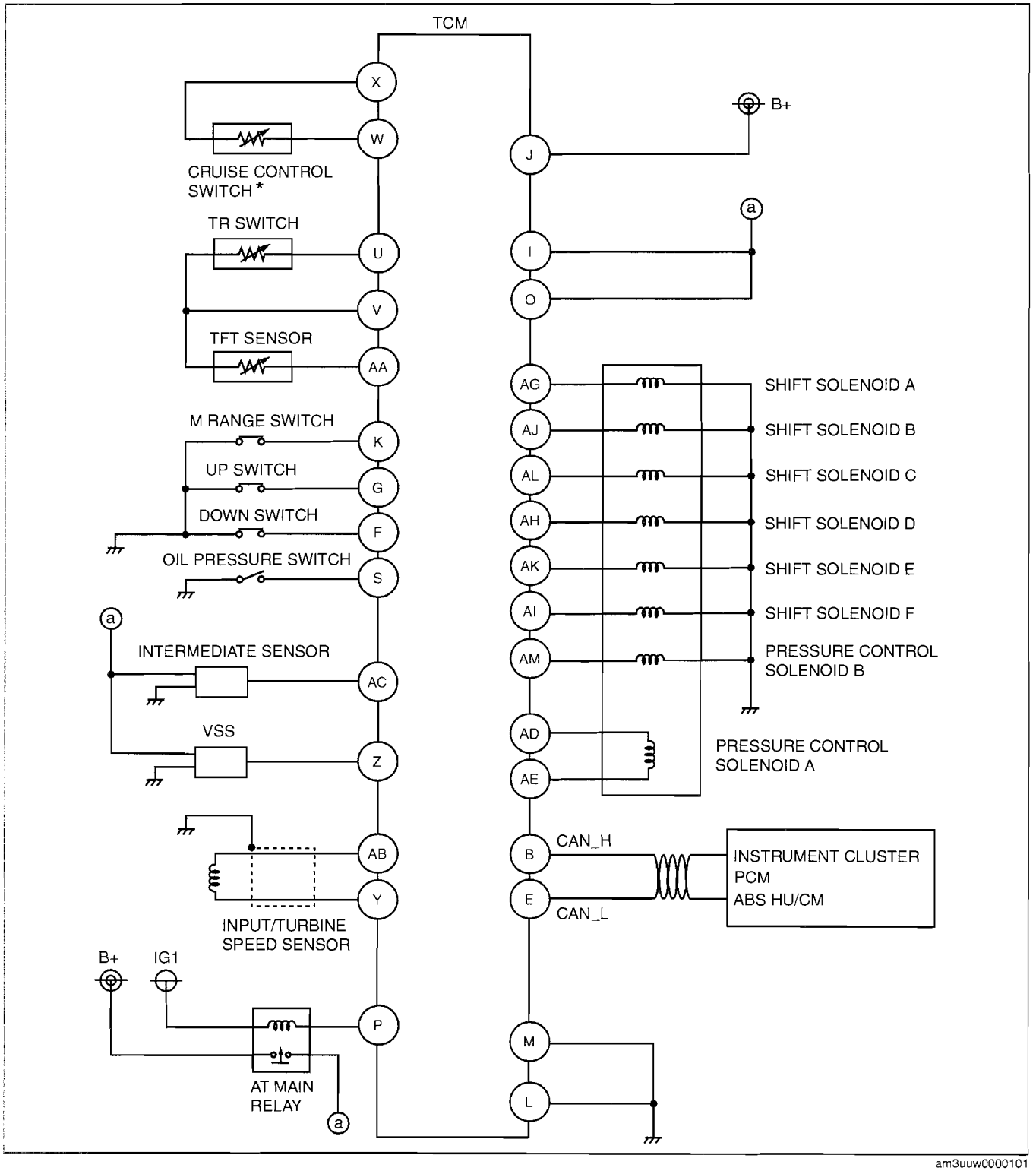
Simulation item	Applicable component	Unit/Condition	Operation		PCM terminal
			IG ON	Idle	
LPS	Pressure control solenoid	%	N/A	X	1M*1, 1N*1/1G*2, 1H*2
SSA/SS1	Shift solenoid A	%	N/A	X	1A*1/1B*2
SSB/SS2	Shift solenoid B	%	N/A	X	1E*1/1C*2
SSC/SS3	Shift solenoid C	%	N/A	X	1F*1/1D*2
SSD/SS4	Shift solenoid D	On/Off	N/A	X	1AD*1/1E*2
SSE_SS5	Shift solenoid E	On/Off	N/A	X	1Z*1/1F*2

*1 : California emission regulation applicable mode
*2 : Except for California emission regulation applicable mode

05-02B ON-BOARD DIAGNOSTIC [FS5A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FS5A-EL]

id050221800100



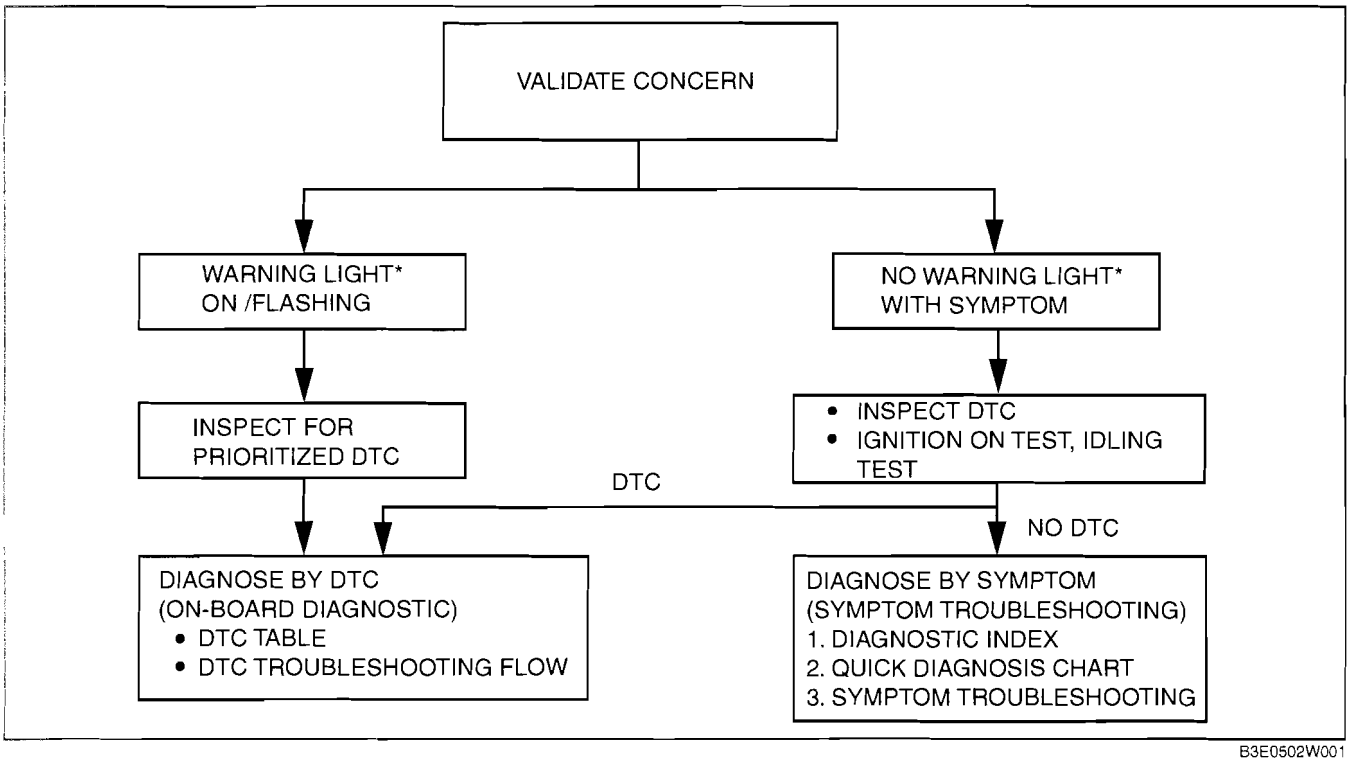
am3uuw0000101

* : Except for California emission regulation applicable model

FOREWORD[FS5A-EL]

id050221800200

- When the customer reports a vehicle malfunction, inspect the malfunction indicator lamp (MIL), AT warning light indication, and TCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart.
  — If a DTC exists, diagnose the applicable DTC. (See 05-02B-9 DTC TABLE[FS5A-EL].)
  — If no DTC exists, the MIL does not illuminate, and AT warning light does not illuminate. Diagnose the applicable symptom troubleshooting. (See 05-03B-4 SYMPTOM TROUBLESHOOTING ITEM TABLE[FS5A-EL].)



B3E0502W001

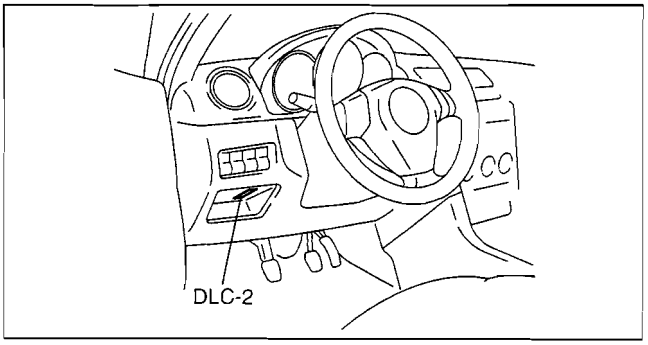
*: Malfunction indicator lamp (MIL), AT warning light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION[FS5A-EL]

id050221800300

DTC Reading Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "TCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TCM".
     3. Select "Self Test".
4. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the TCM. (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].)



am3uuw0000006

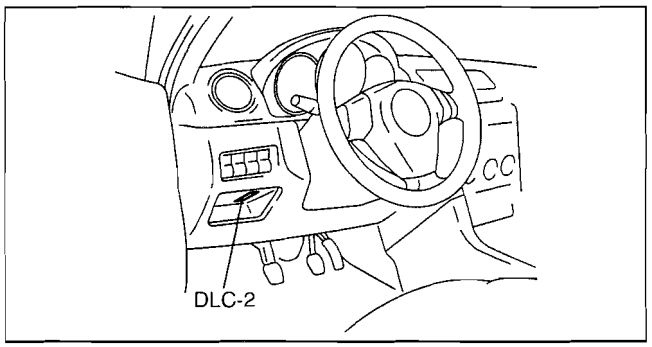
AFTER REPAIR PROCEDURE[FS5A-EL]

id050221800400

Caution

- **After repairing a malfunction, perform the following procedure to verify that the malfunction has been corrected.**
- **When performing this procedure, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.**

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "SelfTest".
     3. Select "Modules".
     4. Select "TCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TCM".
     3. Select "SelfTest".
3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Perform the following DTC inspections to ensure that the DTCs have been resolved:



am3uuw0000005

DTC No.	inspection
P0706, P0707, P0708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **20 km/h {12.4 mph} or more** for **100 s or more**. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range at **20 km/h {12.4 mph} or more** for **100 s or more**. vii. Go to Step 6.
P0711	i. Start the engine then wait **180 s or more**. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **within 25—59 km/h {16—36 mph}** for **90 s or more**. iv. Drive the vehicle in D range, at **60 km/h {37 mph}** for **60 s or more**. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Drive the vehicle in D range, at **within 25—59 km/h {16—36 mph}** for **90 s or more**. viii. Drive the vehicle in D range, at **60 km/h {37 mph} or more** for **60 s or more**. ix. Go to Step 6.
P0712, P0713	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **20 km/h {12 mph} or more** for **150 s or more**. iv. Go to Step 6.
P0715	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range, at **41 km/h {25 mph} or more** for **0.7 s or more**. iv. Go to Step 6.
P0720	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **4.5 s or more**. • Turbine speed (TSS PID): **1,500 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.

DTC No.	inspection
P0731	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 1GR • Throttle opening angle (THOP PID): **2.77% or more** iv. Go to Step 6.
P0732	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 3 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 2GR iv. Go to Step 6.
P0733	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 3GR iv. Go to Step 6.
P0734	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D or M range, 4GR iv. Go to Step 6.
P0735	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D or M range, from 1GR to 5GR iv. Go to Step 6.
P0741	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Go to Step 6.
P0742	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. iv. Go to Step 6.
P0744, P0753, P0758, P0763, P0768, P0773, P0778, P0841, P0883, P1783, P2709	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR and TCC is operated. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR and TCC is operated. vii. Go to Step 6.
P0745	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range. iv. Go to Step 6.

DTC No.	inspection
P0751	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **15 s or more.** • Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.
P0752	i. Start the engine. ii. Warm up the engine and ATX. iii. Selector lever position: D range iv. Depress the brake pedal. v. Turn the ignition switch to the LOCK position. vi. Start the engine. vii. Selector lever position: D range viii. Depress the brake pedal. ix. Go to Step 6.
P0756	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR vii. Go to Step 6.
P0757, P0766	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **28 km/h {17 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle at closed throttle position • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 2GR and 4GR vii. Go to Step 6.

DTC No.	inspection
P0761	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 1GR and 2GR vii. Go to Step 6.
P0762	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Turbine speed (TSS PID): **225—4,987 rpm** • Differential gear case (output) revolution speed (OSS PID): **35 rpm or more** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0767	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more.** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 3GR vii. Go to Step 6.
P0771	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions for **5 s or more.** • Vehicle speed (VSS PID): **60—100 km/h {38—62 mph}** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR vii. Go to Step 6.

DTC No.	inspection
P0772	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions. • Vehicle speed (VSS PID): **70 km/h {43 mph} or less** • Turbine speed (TSS PID): **225—4,987 rpm** • Selector lever position: D range, 4GR • Throttle conditions — Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle is at closed throttle position and **5 s or more** have passed. vii. Go to Step 6.
P0777	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR vii. Go to Step 6.
P0791	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle in D range at **40 km/h {25 mph} or more** for **4.5 s or more**. iv. Go to Step 6.
P0894	i. Start the engine. ii. Warm up the engine and ATX. iii. Depress the brake pedal. iv. Throttle opening angle at closed throttle position. v. Shift the selector lever from the N position to the D range and hold for **3 s or more**. vi. Go to Step 7.
P2707	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 3GR or 4GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 3GR or 4GR vii. Go to Step 6.

DTC No.	inspection
P2708	i. Start the engine. ii. Warm up the engine and ATX. iii. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR iv. Turn the ignition switch to the LOCK position. v. Start the engine. vi. Drive the vehicle under the following conditions 4 times or more. • Turbine speed (TSS PID): **225—4,987 rpm** • Throttle opening angle (THOP PID): **2.77% or more** • Selector lever position: D range, 5GR vii. Go to Step 6.

6. Gradually slow down and stop the vehicle.
7. Make sure that the repaired DTC does not recur.

DTC TABLE[FS5A-EL]

id050221800500

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0706	Transaxle range (TR) switch circuit range/ performance	ON	YES	2	CCM	X	(See 05-02B-12 DTC P0706[FS5A-EL].)
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	X	(See 05-02B-13 DTC P0707[FS5A-EL].)
P0708	Transaxle range (TR) switch circuit high input	ON	YES	2	CCM	X	(See 05-02B-15 DTC P0708[FS5A-EL].)
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)	ON	NO	2	CCM	X	(See 05-02B-17 DTC P0711[FS5A-EL].)
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	X	(See 05-02B-18 DTC P0712[FS5A-EL].)
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	X	(See 05-02B-21 DTC P0713[FS5A-EL].)
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-23 DTC P0715[FS5A-EL].)
P0720	Vehicle speed sensor (VSS) circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-26 DTC P0720[FS5A-EL].)
P0731	Gear 1 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-28 DTC P0731[FS5A-EL].)
P0732	Gear 2 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-30 DTC P0732[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0733	Gear 3 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-33 DTC P0733[FS5A-EL].)
P0734	Gear 4 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-35 DTC P0734[FS5A-EL].)
P0735	Gear 5 incorrect (incorrect gear ratio detected)	OFF	YES	1	CCM	X	(See 05-02B-38 DTC P0735[FS5A-EL].)
P0741	Torque converter clutch (TCC) (stuck off)	OFF	YES	1	CCM	X	(See 05-02B-40 DTC P0741[FS5A-EL].)
P0742	Torque converter clutch (TCC) (stuck on)	OFF	YES	1	CCM	X	(See 05-02B-41 DTC P0742[FS5A-EL].)
P0744	Slip control malfunction	OFF	YES	2	CCM	X	(See 05-02B-43 DTC P0744[FS5A-EL].)
P0745	Pressure control solenoid A malfunction	OFF	YES	1	CCM	X	(See 05-02B-45 DTC P0745[FS5A-EL].)
P0751	Shift solenoid A stuck off	ON	YES	2	CCM	X	(See 05-02B-47 DTC P0751[FS5A-EL].)
P0752	Shift solenoid A stuck on	ON	YES	2	CCM	X	(See 05-02B-49 DTC P0752[FS5A-EL].)
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-51 DTC P0753[FS5A-EL].)
P0756	Shift solenoid B stuck off	ON	YES	2	CCM	X	(See 05-02B-53 DTC P0756[FS5A-EL].)
P0757	Shift solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02B-55 DTC P0757[FS5A-EL].)
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-57 DTC P0758[FS5A-EL].)
P0761	Shift solenoid C stuck off	ON	YES	2	CCM	X	(See 05-02B-59 DTC P0761[FS5A-EL].)
P0762	Shift solenoid C stuck on	ON	YES	2	CCM	X	(See 05-02B-61 DTC P0762[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-63 DTC P0763[FS5A-EL].)
P0766	Shift solenoid D stuck off	ON	YES	2	CCM	X	(See 05-02B-65 DTC P0766[FS5A-EL].)
P0767	Shift solenoid D stuck on	ON	YES	2	CCM	X	(See 05-02B-67 DTC P0767[FS5A-EL].)
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-69 DTC P0768[FS5A-EL].)
P0771	Shift solenoid E stuck off	ON	YES	2	CCM	X	(See 05-02B-71 DTC P0771[FS5A-EL].)
P0772	Shift solenoid E stuck on	ON	YES	2	CCM	X	(See 05-02B-73 DTC P0772[FS5A-EL].)
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-75 DTC P0773[FS5A-EL].)
P0777	Pressure control solenoid B stuck on	ON	YES	2	CCM	X	(See 05-02B-77 DTC P0777[FS5A-EL].)
P0778	Pressure control solenoid B malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-79 DTC P0778[FS5A-EL].)
P0791	Intermediate sensor circuit malfunction	ON	YES	1	CCM	X	(See 05-02B-82 DTC P0791[FS5A-EL].)
P0841	Oil pressure switch circuit malfunction	OFF	NO	2	CCM	X	(See 05-02B-85 DTC P0841[FS5A-EL].)
P0882	Battery back-up power supply circuit malfunction	ON	NO	1	CCM	X	(See 05-02B-87 DTC P0882[FS5A-EL].)
P0883	Battery voltage high	ON	YES	1	CCM	X	(See 05-02B-89 DTC P0883[FS5A-EL].)
P0894	Forward clutch torque transmission	OFF	YES	1	CCM	X	(See 05-02B-90 DTC P0894[FS5A-EL].)
P1783	ATF high oil temperature malfunction	OFF	YES	1	CCM	X	(See 05-02B-91 DTC P1783[FS5A-EL].)

DTC No.	Condition	MIL	AT warning light illuminates	DC	Monitor item	Memory function	Page
P2707	Shift solenoid F stuck off	ON	YES	2	CCM	X	(See 05-02B-92 DTC P2707[FS5A-EL].)
P2708	Shift solenoid F stuck on	ON	YES	2	CCM	X	(See 05-02B-94 DTC P2708[FS5A-EL].)
P2709	Shift solenoid F malfunction (electrical)	ON	YES	1	CCM	X	(See 05-02B-96 DTC P2709[FS5A-EL].)
U0073	CAN system communication error	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					
U0100	Communication error to PCM	(See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])					

DTC P0706[FS5A-EL]

id050221800900

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Engine speed **530 rpm or more** — Vehicle speed **20 km/h {12 mph} or more** — Voltage at TCM terminal U **0.5 V or more** — P, R, N, or D range/position not detected **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • TR switch misadjustment • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Adjust the TR switch, then go to the next step. (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)
		No	Replace the TR switch, then go to the next step. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)

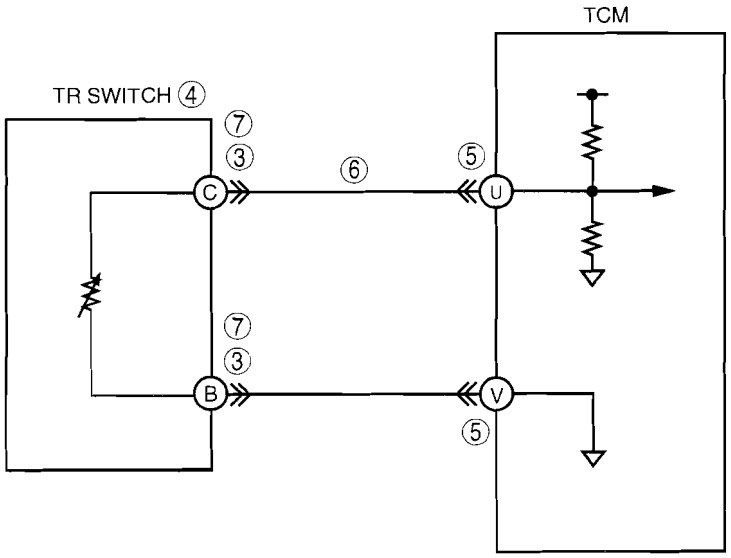
STEP	INSPECTION		ACTION
4	**VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in each range (D and R) for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0707[FS5A-EL]

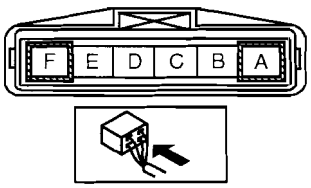
id050221801000

DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at TCM terminal U **0.5 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Short to ground in wiring harness between TR switch terminal C and TCM terminal U • TR switch signal and TR switch ground circuits shorted each other • TCM malfunction

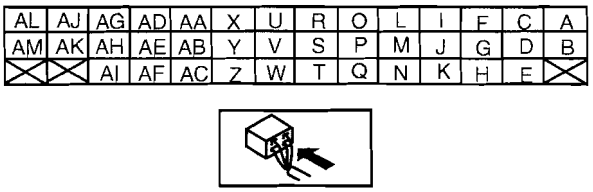
DTC P0707	Transaxle range (TR) switch circuit low input



TR SWITCH WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection at TR switch terminals B and C (part-side) (such as damaged/pulled-out pins, corrosion) • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 8. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
4	**INSPECT TR SWITCH** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 8. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection at terminals U and V (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.

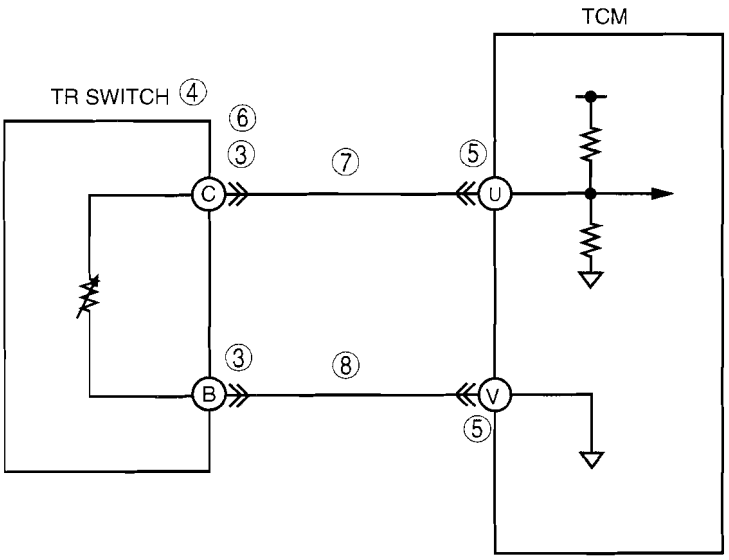
STEP	INSPECTION		ACTION
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between TR switch terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for short to ground, then go to Step 8.
		No	Go to the next step.
7	**INSPECT TR SWITCH CIRCUIT FOR SHORT CIRCUIT** • Inspect for continuity between TR switch terminals B and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for short circuit, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID): **530 rpm or more** — Vehicle speed (VSS PID): **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0708[FS5A-EL]

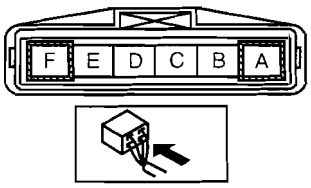
id050221801100

DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	• When all conditions below are satisfied and **100 s or more** have passed. — Vehicle speed **20 km/h {12 mph} or more** — Engine speed **530 rpm or more** — Voltage at TCM terminal U **4.79 V or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TR switch malfunction • Open circuit in wiring harness between TR switch terminal C and TCM terminal U • Short to power supply in wiring harness between TR switch terminal C and TCM terminal U • Open circuit in wiring harness between TR switch terminal B and TCM terminal V • Poor connection of TR switch or TCM connectors • TCM malfunction

DTC P0708	Transaxle range (TR) switch circuit high input

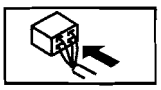


TR SWITCH WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TR switch connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Are TR switch terminals normal?	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 9. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
4	**INSPECT TR SWITCH** • Inspect for resistance between TR switch terminals B and C (part-side). • Is the resistance normal? (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the TR switch, then go to Step 9. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
5	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection at terminals U and V (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to step 9.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between TR switch terminal C and (wiring harness-side) body ground. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for short to power supply, then go to Step 9.
		No	Go to the next step.
7	**INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal C (wiring harness-side) and TCM terminal U. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to step 9.
8	**INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TR switch terminal B (wiring harness-side) and TCM terminal V. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	**VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle for **100 s or more** under the following conditions: — Engine speed (RPM PID) **530 rpm or more** — Vehicle speed (VSS PID) **20 km/h {12 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0711[FS5A-EL]

id050221801200

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	• When all conditions below are satisfied. — When **180 s or more** have passed after the engine is started, vehicle is driven for **90 s or more** at vehicle speed **between 25—59 km/h {15—36 mph}**, then **60 km/h {37 mph} or more** for **60 s or more**. — P0712, P0713 not output — Variation in ATF voltage **0.03 V or less** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light does not illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Connector corrosion • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

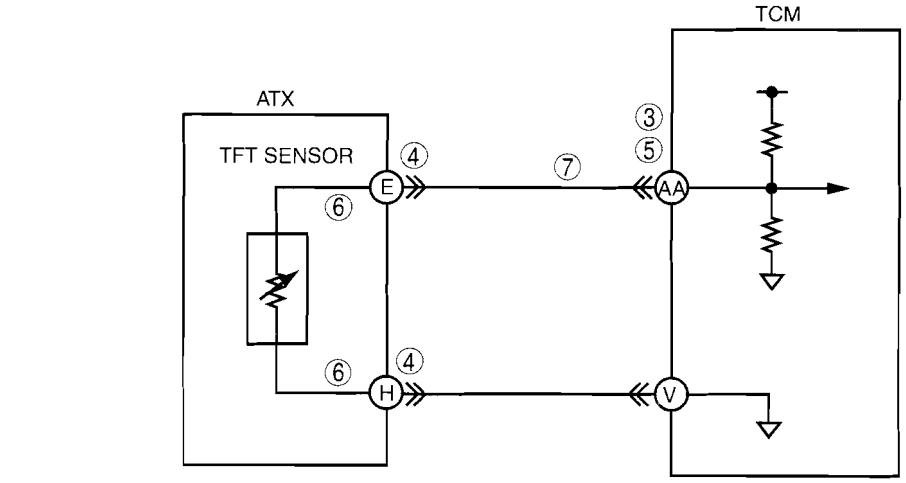
STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TFT SENSOR VOLTAGE** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA. • Record terminal AA voltage. • Start the engine. • Drive the vehicle at **60 km/h {37 mph} or more** for **330 s or more**. • Record terminal AA voltage again. • Is the variation in voltage **0.03 V or more**?	Yes	Go to Step 5.
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect terminals for corrosion. • Are terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminals, then go to the next step.
5	**VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Decrease ATF temperature to **20 °C {68 °F} or less**. • Start the engine and wait for **180 s or more**. • Drive the vehicle at a vehicle speed **between 25—59 km/h {15—36 mph}** for **90 s or more**. • Drive the vehicle at a vehicle speed **60 km/h {37 mph} or more** for **60 s or more**. • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0712[FS5A-EL]

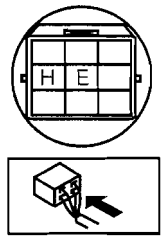
id050221801300

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	• If the TCM detects either of the following conditions for **150 s or more**, the TCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **0.12 V or less** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Short to ground in wiring harness between TFT sensor and transaxle connector (primary) terminal E • Short to ground in wiring harness between TFT sensor and transaxle connector (primary) terminal H • Short to ground in wiring harness between transaxle connector (primary) terminal E and TCM terminal AA • Damaged connectors between TFT sensor and TCM • TCM malfunction

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)

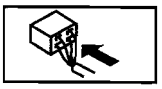


TRANSAXLE CONNECTOR (PRIMARY)
WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



05-02B

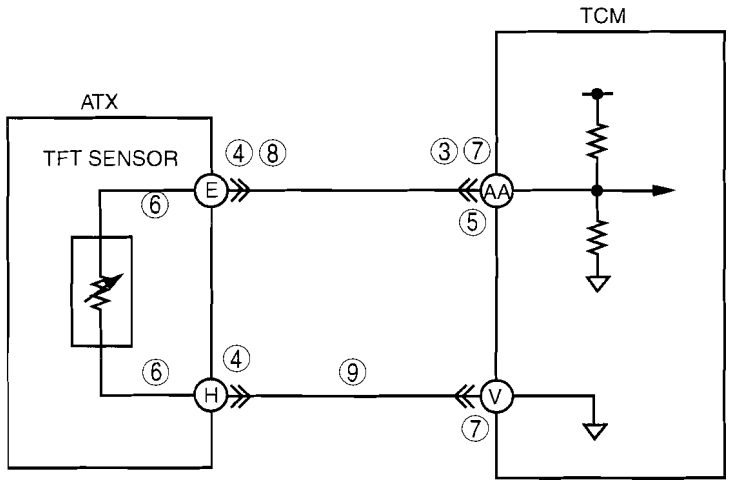
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at TCM terminal AA. • Is the voltage **0.06 V or more**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TERMINAL CONDITION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Are the terminals bent?	Yes	Repair or replace the terminals, then go to Step 8. • If the terminals cannot be repaired, replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Verify that the voltage changes to **4.67 V or more** at TCM terminal AA when transaxle connector (primary) is disconnected. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 8.
6	**INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect for continuity between transaxle connector (primary) terminals (transaxle case side) and body ground. — E and body ground — H and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Replace the TFT sensor, then go to Step 8. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
7	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

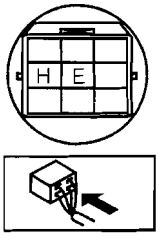
DTC P0713[FS5A-EL]

id050221801400

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	• If the TCM detects the following condition for **150 s or more**, the TCM determines that the TFT sensor circuit has a malfunction. — TFT sensor voltage **4.67 V or more** and vehicle speed **20 km/h {12 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit in wiring harness between TFT sensor and transaxle connector (primary) terminal E • Open circuit in wiring harness between TFT sensor and transaxle connector (primary) terminal H • Open circuit in wiring harness between transaxle connector (primary) terminal E and TCM terminal AA • Open circuit in wiring harness between transaxle connector (primary) terminal H and TCM terminal V • Damaged connectors between TFT sensor and TCM • TCM malfunction

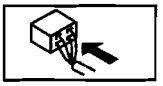


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

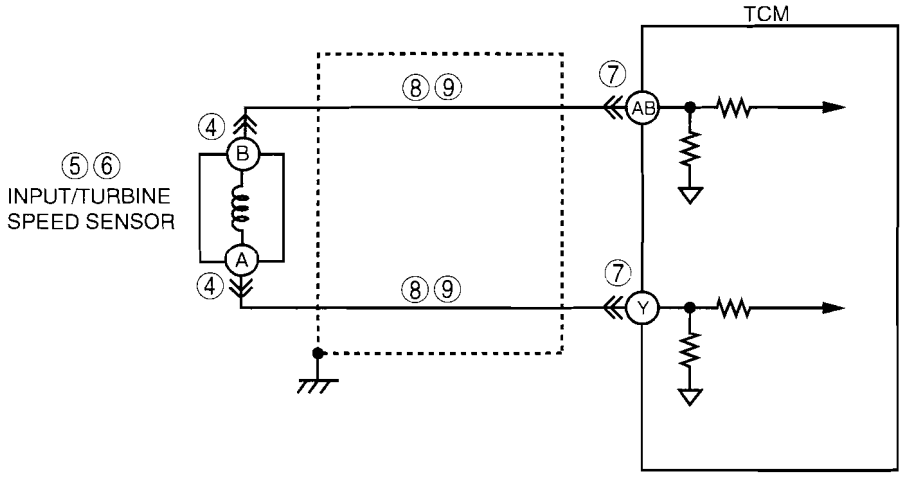
STEP	INSPECTION		ACTION
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA. • Is the voltage **4.67 V or less**?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Inspect transaxle connector (primary) connection. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT TFT SENSOR CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Measure the voltage at TCM terminal AA when connect between transaxle connector (primary) terminals E and H (wiring harness-side) using jumper wire. • Verify that voltage changes to **0.06 V or less**. • Does the voltage change?	Yes	Go to the next step.
		No	Go to Step 7.
6	**INSPECT TFT SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between transaxle connector (primary) terminals (transaxle case side) E and H. • Is there continuity?	Yes	Replace the TFT sensor, then go to Step 10. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
		No	Repair or replace the wiring harness, then go to Step 10.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT WIRING HARNESS FOR OPEN CIRCUIT** • Disconnect the transaxle connector (primary). • Connect the TCM connector. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal E (vehicle wiring harness-side). • Is the voltage **5 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal H (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
10	**VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle under the following condition for **150 s or more**. — Vehicle speed (VSS PID) **20 km/h {12 mph} or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

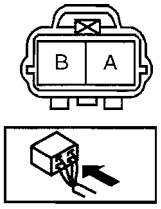
DTC P0715[FS5A-EL]

id050221806100

DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION	• When all conditions below are satisfied and **0.7 s or more** have passed. — D range of TR switch input — Driving vehicle at vehicle speed of **41 km/h {25 mph} or more** — Input/turbine speed sensor signal not input **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Input/turbine speed sensor malfunction • Short to ground in wiring harness between input/turbine speed sensor terminal A and TCM terminal Y • Short to ground in wiring harness between input/turbine speed sensor terminal B and TCM terminal AB • Open circuit in wiring harness between input/turbine speed sensor terminal A and TCM terminal Y • Open circuit in wiring harness between input/turbine speed sensor terminal B and TCM terminal AB • Damaged connectors between input/turbine speed sensor and TCM • TCM malfunction

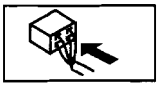


INPUT/TURBINE SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

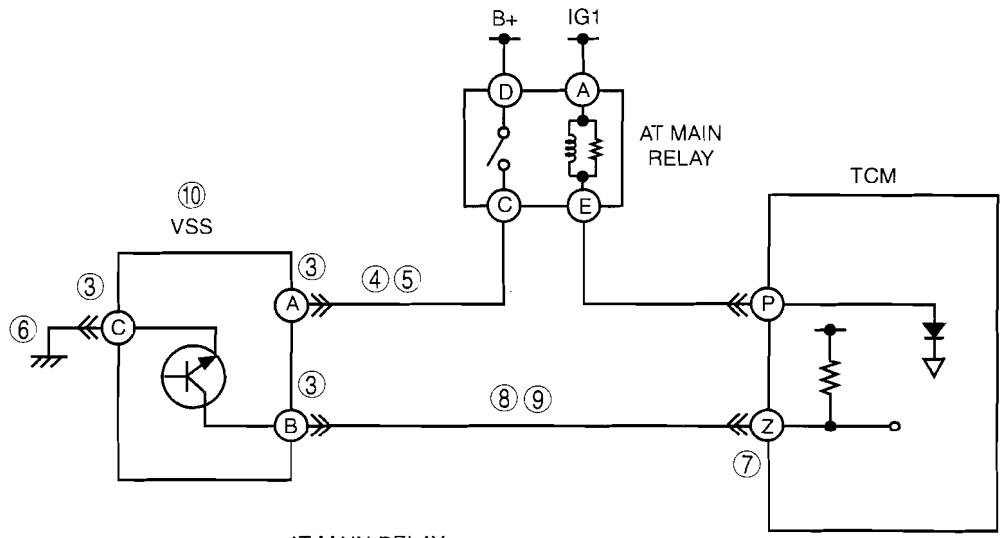
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT INPUT SIGNAL STATUS** • Turn the ignition switch to the LOCK position. • Start the engine. • Measure the frequency of input/turbine speed sensor using a oscilloscope. — IG ON: **0 Hz** — Idle: **Within 320—374 Hz** (P, N position) • Are frequencies of input/turbine speed sensor within specifications?	Yes	Go to the intermittent concern troubleshooting procedure. (See 01-03A-66 INTERMITTENT CONCERN TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
4	**INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the input/turbine speed sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE** • Measure the resistance between the input/ turbine speed sensor terminals (part-side). • Is the resistance **within 250—600 ohms** between input/turbine speed sensor terminals (part-side)? (See 05-17B-24 INPUT/TURBINE SPEED SENSOR INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Replace the input/turbine speed sensor, then go to Step 10. (See 05-17B-25 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
6	**INSPECT INPUT/TURBINE SPEED SENSOR** • Remove input/turbine speed sensor. • Is there iron powder stuck on input/turbine speed sensor? (See 05-17B-25 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL].)	Yes	Clean the input/turbine speed sensor, then go to Step 10.
		No	Go to the next step.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
8	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect the following input/turbine speed sensor terminals (wiring harness-side) and TCM terminals (wiring harness-side): — A and Y — B and AB • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND** • Inspect input/turbine speed sensor terminal (wiring harness-side) and body ground. — A and body ground — B and body ground • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle a vehicle speed **41 km/h {25 mph} or more** for **0.7 s or more**. • Is the same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

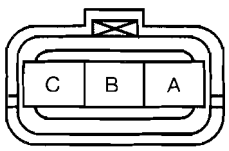
DTC P0720[FS5A-EL]

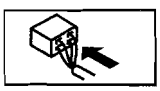
id050221809800

DTC P0720	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	• Vehicle speed signal is not input after the following conditions are met and **4.5 s or more** have passed. — D range switch ON — Engine coolant temperature **60 °C {140 °F} or more** — Turbine speed **1,500 rpm or more** — Secondary gear revolution speed **50 rpm or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• VSS malfunction • Open circuit in wiring harness between VSS terminal B and TCM terminal Z • Short to ground in wiring harness between VSS terminal B and TCM terminal Z • Open circuit in wiring harness between VSS terminal A and main relay terminal C • Short to ground in wiring harness between VSS terminal A and AT main relay terminal C • Open circuit in wiring harness between VSS terminal C and body ground • Damaged connectors between VSS and TCM • TCM malfunction

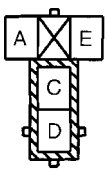


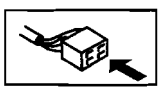
VSS WIRING HARNESS-SIDE CONNECTOR





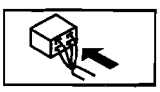
AT MAIN RELAY WIRING HARNESS-SIDE CONNECTOR





TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT VSS CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the VSS connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that the VSS connector is disconnected. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between VSS terminal A (wiring harness-side) and ground. • Is the voltage **B+**?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT VSS POWER CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between VSS terminal A (wiring harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
6	**INSPECT VSS GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that the VSS connector is disconnected. • Inspect for continuity between VSS (wiring harness-side) terminal C and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
8	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the TCM connector and VSS connector. • Inspect for continuity between VSS terminal B and TCM terminal Z. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verity that the VSS connector and TCM connector are disconnected. • Inspect for continuity between TCM terminal Z and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Replace the VSS, then go to the next step. (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)
10	**INSPECT VEHICLE SPEED SENSOR** • Inspect the VSS. (See 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].) • Is VSS normal?	Yes	Go to the next step.
		No	Repair or replace the VSS, then go to Step 11.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0720 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up engine. • Drive the vehicle under the following conditions for **4.5 s or more** while monitoring PIDs. — Engine coolant temp (ECT PID): **60 °C {140 °F} or more** — Drive in D or M range — Frequency of input/turbine speed sensor: **800 Hz or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0731[FS5A-EL]

id050221801900

DTC P0731	Gear 1 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors the revolution ratio of the forward clutch drum revolution to secondary gear revolution when the following monitoring conditions are met. If the revolution ratio is **2.157 or less**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Throttle opening angle **2.77% or more** — Differential gear case (output) revolution speed **35 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck • Pressure control solenoid A stuck • Line pressure low • One-way clutch slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID A** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A when applying B+ to transaxle terminal A. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid that you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **20 km/h {12 mph}** — Drive in the D range, 1GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0731** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 4 times for **more than 1 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 1GR — Throttle opening angle (THOP PID): **2.77% or more** — Vehicle speed (VSS PID): **4 km/h {3 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0732[FS5A-EL]

id050221802000

DTC P0732	Gear 2 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If revolution ratio is **1.249 or less** or **2.157 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 2 GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECTION SHIFT SOLENOID A, B AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A, B, and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **40 km/h {24 mph}** — Drive in the D range, 2GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0732** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions at least 3 times for **more than 1 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 2GR — Vehicle speed (VSS PID): **3.8 km/h {2.4 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0733[FS5A-EL]

id050221802100

DTC P0733	Gear 3 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.863 or less**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Torque converter clutch (TCC) not operating — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **2.175 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 1.345—1.644**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3 GR in D or M range — Torque converter clutch (TCC) not operating — Vehicle speed **26 km/h {16 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A or C stuck • Pressure control solenoid A stuck • Line pressure low • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass, TCC or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECTION SHIFT SOLENOID A AND C FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid A and C when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear a click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **60 km/h {37 mph}** — Drive in the D range, 3GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
8	**VERIFY REPAIR OF DTC P0733** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 2 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 3GR — Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0734[FS5A-EL]

id050221802200

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **0.6 or less** or **1.249 or more**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR in D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Vehicle speed **28 km/h {17 mph} or more** — Throttle opening angle at closed throttle position — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 • The TCM monitors revolution ratio of the forward clutch drum revolution to the secondary gear case revolution when the following monitoring conditions are met. If the revolution ratio is **within 0.91—1.09**, the TCM determines that there is a malfunction. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR in D or M range — Torque converter clutch (TCC) not operating — Vehicle speed **36 km/h {22 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.

DTC P0734	Gear 4 incorrect (incorrect gear ratio detected)
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Forward clutch slipping • Control valve stuck (Bypass or 3-4 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 8.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 8. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID A AND D FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoids A and D when applying B+ to each transaxle terminal. **Note** • The click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 8. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 8. Any ranges: Replace the primary control valve body, then go to Step 8. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 8. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
7	**INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 1,300 Hz**?	Yes	Go to the next step.
		No	Replace the primary control valve body, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
8	**VERIFY REPAIR OF DTC P0734** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 5 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **0%** — Vehicle speed (VSS PID): **36 km/h {22 mph} or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0735[FS5A-EL]

id050221802300

DTC P0735	Gear 5 incorrect (incorrect gear ratio detected)
DETECTION CONDITION	• The TCM monitors revolution ratio of the secondary gear revolution to the differential gear case revolution when the following monitoring conditions are met. When any of the following conditions are met: — Revolution ratio of the secondary gear and the differential gear case is **1.11 or less** when driving in 3GR or 4GR. — Revolution ratio of the secondary gear and differential gear case is **1.11 or more** when driving in 5GR. **Monitoring conditions:** — Engine running — ATF temperature **20 °C {68 °F} or more** — Throttle opening angle **2.77% or more** — Secondary gear revolution speed **50 rpm or more** — Turbine speed **within 225—4,987 rpm** — Vehicle speed **29 km/h {18 mph} or more** — Differential gear case (output) revolution speed **35 rpm or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0777, P0778, P0791, P2707, P2708, P2709 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate. • The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is not available. • A PENDING CODE is not available. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid F stuck • Pressure control solenoid B stuck • Line pressure low • Direct clutch slipping • Reduction brake slipping • Control valve stuck (Bypass or 4-5 shift valve) • Oil pump malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 9.
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 9. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT SHIFT SOLENOID F AND PRESSURE CONTROL SOLENOID B FOR CLICK SOUND** • Perform operation inspection. (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].) • Verify the click sound of shift solenoid F and pressure control solenoid B when applying B+ to each transaxle terminal. • Was a click heard from solenoids?	Yes	Go to the next step.
		No	Replace the solenoid where you could not hear click sound, then go to Step 9. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 9. Any ranges: Replace the secondary control valve body, then go to Step 8. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT STALL SPEED** • Measure the stall speed in D range. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Is the stall speed within the specification?	Yes	Go to the next step.
		No	Replace the automatic transaxle, then go to Step 9. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
7	**INSPECT FREQUENCY OF INTERMEDIATE SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of intermediate sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **80 km/h {49 mph}** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the intermediate sensor at **approx. 4,800 Hz**?	Yes	Go to the next step.
		No	Replace the secondary control valve body, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
8	**INSPECT FREQUENCY OF INTERMEDIATE SENSOR WHEN DRIVING VEHICLE** • Turn the ignition switch to the LOCK position. • Connect the M-MDS. • Start the engine. • Measure the frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed (VSS PID): **90 km/h {56 mph}** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **approx. 25%** • Was the frequency of the input/turbine speed sensor at **approx. 4,100 Hz**?	Yes	Go to the next step.
		No	Replace the secondary control valve body, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
9	**VERIFY REPAIR OF DTC P0735** • Make sure to reconnect all the disconnected connectors. • Clear the DTC using the M-MDS. • Start the engine. • Warm up the transaxle. • Drive the vehicle under the following conditions for **more than 5 s**: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **2.77% or more** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0741[FS5A-EL]

id050221807900

DTC P0741	Torque converter clutch (TCC) stuck off
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — Torque converter clutch (TCC) operating — Shift solenoid A duty value exceeds **99%** — Difference between engine speed and turbine speed **more than 100 rpm** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the automatic transaxle, then go to Step 6. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions for **5 s or more**. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC operation) — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0742[FS5A-EL]

id050221808000

DTC P0742	Torque converter clutch (TCC) stuck on
DETECTION CONDITION	• All of the following conditions are satisfied under each of the following throttle conditions. — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Engine running — Turbine speed **within 225—4,987 rpm** — Vehicle speed **70 km/h {43 mph} or less** — Torque converter clutch (TCC) not operating — Difference between engine speed and turbine speed **50 rpm or less** — DTC P0734 not output — Throttle conditions • Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed. • Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed. • Throttle opening angle is at closed throttle position and **5 s or more** have passed. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects the above malfunction conditions during first the drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B, C, D, E, and pressure control solenoid A stuck • Line pressure low • 2-4 brake band slipping • 3-4 clutch slipping • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 4. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
3	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 6. • Any ranges: Replace the automatic transaxle, then go to Step 6. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
5	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up engine and ATX. • Drive the vehicle under the following conditions: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR (TCC not in operation) — Vehicle speed (VSS PID): **70 km/h {43 mph} or less**. • Throttle conditions — Throttle opening angle (THOP PID) **6.25% or more** and **5 s or more** have passed. — Throttle opening angle (THOP PID) **within 3.13—6.25%** and **3 s or more** have passed. — Throttle opening angle at closed throttle position and **5 s or more** have passed. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0744[FS5A-EL]

id050221809700

DTC P0744	Slip control malfunction
DETECTION CONDITION	• With the engine running, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle **18.75% or less** — Torque converter clutch (TCC) operating — Drive the vehicle at 3GR, 4GR, or 5GR, slip control operation — When any of the following conditions are met: • Revolution ratio of the forward clutch drum to secondary gear is **1.344 or less** or **1.645 or more** when driving in 2GR. • Revolution ratio of the forward clutch drum to secondary gear is **0.91 or less** or **1.09 or more** when driving in 3GR. • Revolution ratio of the forward clutch drum to secondary gear is **0.636 or less** or **0.817 or more** when driving in 4GR. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • DTCs are stored in the TCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and TCM terminal 1A • Shift solenoid A stuck on • Short to power supply in wiring harness between shift solenoid D terminal A and TCM terminal 1F • Shift solenoid D stuck on • Short to ground in wiring harness between shift solenoid E terminal A and TCM terminal 1H • Shift solenoid E stuck off • TCM malfunction

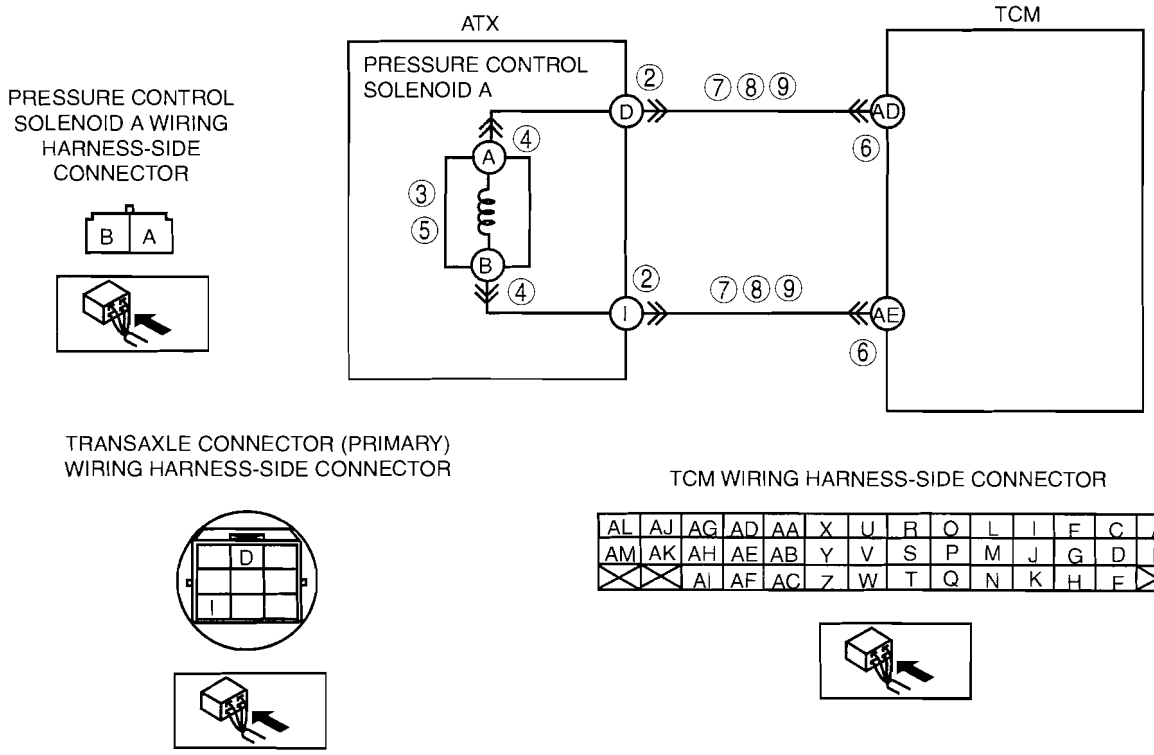
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTCs in the TCM memory. • Are DTCs P0752, P0753, P0767, P0768, P0771, and P0773 output?	Yes	Go to the applicable DTC inspection.
		No	Replace the forward clutch, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0744 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up the engine. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 5GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Throttle opening angle (THOP PID): **18.75% or less** • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0745[FS5A-EL]

id050221806600

DTC P0745	Pressure control solenoid A malfunction
DETECTION CONDITION	• If the TCM detects either of the following conditions, the TCM determines that pressure control solenoid A circuit has a malfunction. — Pressure control solenoid A voltage stuck **0 V** after engine start — Pressure control solenoid A voltage stuck **B+** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if TCM detects above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Pressure control solenoid A malfunction • Open circuit in wiring harness between pressure control solenoid A terminal B and transaxle connector (primary) terminal I • Open circuit in wiring harness between transaxle connector (primary) terminal I and TCM terminal AE • Short to ground in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Short to power supply in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Open circuit in wiring harness between pressure control solenoid A terminal A and transaxle connector (primary) terminal D • Open circuit in wiring harness between transaxle connector (primary) terminal D and TCM terminal AD • Damaged connector between pressure control solenoid A and TCM • TCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
3	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminals D and I (transaxle case side). • Is the resistance **within 2.4—7.3 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 6.
		No	Go to the next step.
4	**INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
5	**INSPECT RESISTANCE** • Inspect the resistance between the pressure control solenoid terminals A and B. • Is the resistance **within 2.4—7.3 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 10.
		No	Verify pressure control solenoid installation. • If solenoid installed correctly, replace the pressure control solenoid, then go to Step 10. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
6	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 10.
7	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between the TCM (wiring harness-side) and transaxle connector (primary) (wiring harness-side). — TCM terminal AD and transaxle connector (primary) terminal D — TCM terminal AE and transaxle connector (primary) terminal I • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, the go to Step 10.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal D (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between transaxle connector (primary) terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
10	**VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Make sure to wait **more than 1 s** after turning the ignition switch to the ON position. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0751[FS5A-EL]

id050221808100

DTC P0751	Shift solenoid A stuck off
DETECTION CONDITION	• When P0731, P0732, and P0733 are not output, and all conditions below are satisfied. — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Vehicle speed **36 km/h {22 mph} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Torque converter clutch (TCC) not operating — Revolution ratio of forward clutch drum revolution to secondary gear revolution **within 0.91—1.09** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **36 km/h {22 mph}** (4GR only) • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0752[FS5A-EL]

id050221808200

DTC P0752	Shift solenoid A stuck on
DETECTION CONDITION	• When P0734 is not output, and all conditions below are satisfied in 1GR and 2GR. — Engine running — ATF temperature **20 °C {68 °F} or more** — D range selected — Brake pedal depressed — Throttle opening angle at closed throttle position — Vehicle speed **0 km/h {0 mph}** — Input/turbine speed sensor signal **187.5 rpm or more**. — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid A stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

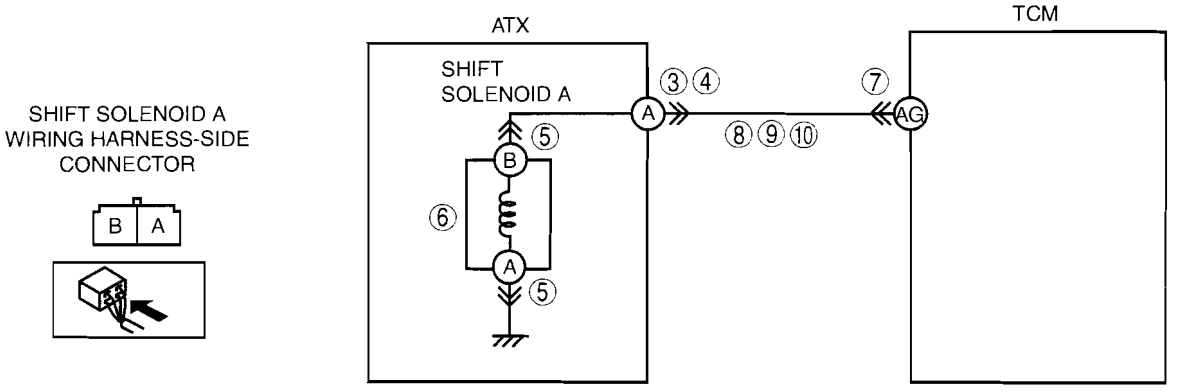
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

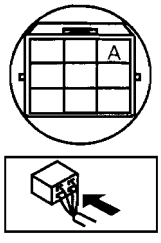
DTC P0753[FS5A-EL]

id050221808300

DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that shift solenoid A circuit has a malfunction. — Shift solenoid A voltage stuck at **B+** after engine start — Shift solenoid A voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid A malfunction • Short to ground in wiring harness between transaxle connector (primary) terminal A and TCM terminal AG • Short to power supply in wiring harness between transaxle connector (primary) terminal A and TCM terminal AG • Open circuit in wiring harness between shift solenoid A terminal B and transaxle connector (primary) terminal A • Open circuit in wiring harness between transaxle connector (primary) terminal A and TCM terminal AG • Open circuit in wiring harness between shift solenoid A terminal A and body ground • Damaged connector between shift solenoid A and TCM • TCM malfunction

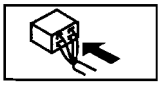


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminal A (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid A connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid A terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid A installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AG (wiring harness-side) and transaxle connector (primary) terminal A (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal A (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AG (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0756[FS5A-EL]

id050221808400

DTC P0756	Shift solenoid B stuck off
DETECTION CONDITION	• When DTC P0732, P0733, and P0734 are not output, and all conditions below are satisfied. — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 1GR at D range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle (THOP PID) **2.77% or more** — Revolution ratio of forward clutch drum revolution to secondary gear revolution **2.157 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **450 rpm or more** — Throttle opening angle (THOP PID): **2.77% or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0757[FS5A-EL]

id050221808500

DTC P0757	Shift solenoid B stuck on
DETECTION CONDITION	• When DTC P0731 and P0733 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 2GR • Engine running • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Turbine speed **within 225—4,987 rpm** • Secondary gear revolution speed **50 rpm or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to secondary gear revolution **1.249 or less** or **2.157 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 — When all conditions below are satisfied with driving in 4GR • Engine running • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Turbine speed **within 225—4,987 rpm** • Secondary gear revolution speed **50 rpm or more** • Differential gear case (output) revolution speed **35 rpm or more** • Vehicle speed **28 km/h {17 mph} or more** • Throttle opening angle at closed throttle position • Revolution ratio of forward clutch drum revolution to secondary gear revolution **0.6 or less** or **1.249 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid B stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

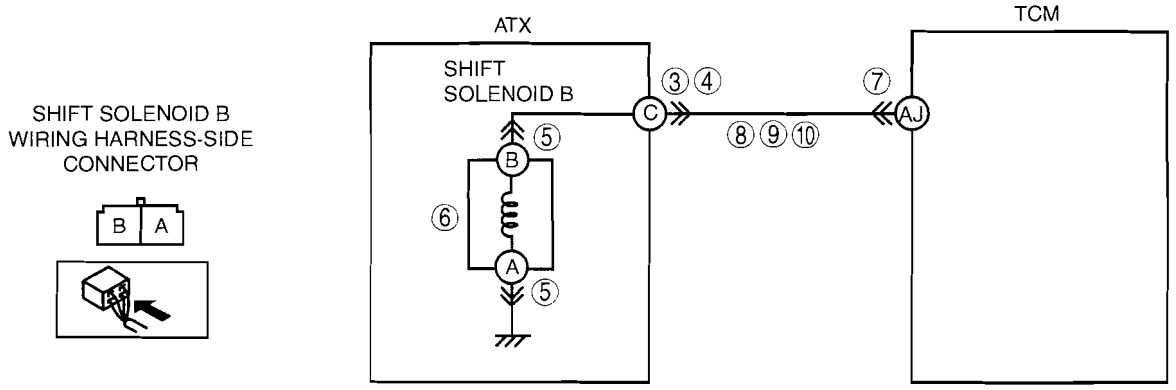
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Engine speed (RPM PID): **450 rpm or more** — Throttle opening angle (THOP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **28 km/h {17 mph} or more** (4GR only) • Is the PENDING CODE present?	Yes	Replace the TCM. then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

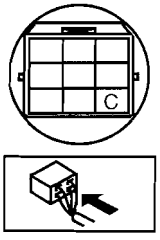
DTC P0758[FS5A-EL]

id050221808600

DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	• If the TCM detects either of the following conditions, the TCM determines that shift solenoid B circuit has a malfunction. — Shift solenoid B voltage stuck at **B+** after engine start — Shift solenoid B voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid B malfunction • Short to ground in wiring harness between transaxle connector (primary) terminal C and TCM terminal AJ • Short to power supply in wiring harness between transaxle connector (primary) terminal C and TCM terminal AJ • Open circuit in wiring harness between shift solenoid B terminal B and transaxle connector (primary) terminal C • Open circuit in wiring harness between transaxle connector (primary) terminal C and TCM terminal AJ • Open circuit in wiring harness between shift solenoid B terminal A and body ground • Damaged connector between shift solenoid B and TCM • TCM malfunction

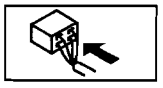


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminal C (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid B connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid B terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid B installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AJ (wiring harness-side) and transaxle connector (primary) terminal C (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect for voltage at transaxle connector (primary) terminal C (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AJ (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0761[FS5A-EL]

id050221808700

DTC P0761	Shift solenoid C stuck off
DETECTION CONDITION	• When DTC P0733 and P0734 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 1GR • Engine running • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Turbine speed **within 225—4,987 rpm** • Secondary gear revolution speed **50 rpm or more** • Throttle opening angle (THOP PID) **2.77% or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to secondary gear revolution **2.157 or less** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 — When all conditions below are satisfied while driving in 2GR • ATF temperature **20 °C {68 °F} or more** • Driving in D or M range • Engine running • Turbine speed **within 225—4,987 rpm** • Secondary gear revolution speed **50 rpm or more** • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to secondary gear revolution **1.249 or less** or **2.157 or more** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.

STEP	INSPECTION		ACTION
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that the gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Throttle opening angle (THOP PID): **2.77% or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0762[FS5A-EL]

id050221808800

DTC P0762	Shift solenoid C stuck on
DETECTION CONDITION	• When DTC P0731 and P0732 are not output, and both the following conditions are satisfied. — When all conditions below are satisfied while driving in 3GR. • Engine running • ATF temperature **20 °C {68 °F} or more.** • Driving in D or M range • Vehicle speed **26 km/h {16 mph} or more** • Turbine speed **within 225—4,987 rpm** • Secondary gear revolution speed **50 rpm or more** • Torque converter clutch (TCC) not operating • Differential gear case (output) revolution speed **35 rpm or more** • Revolution ratio of forward clutch drum revolution to secondary gear revolution **within 1.345—1.644** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid C stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

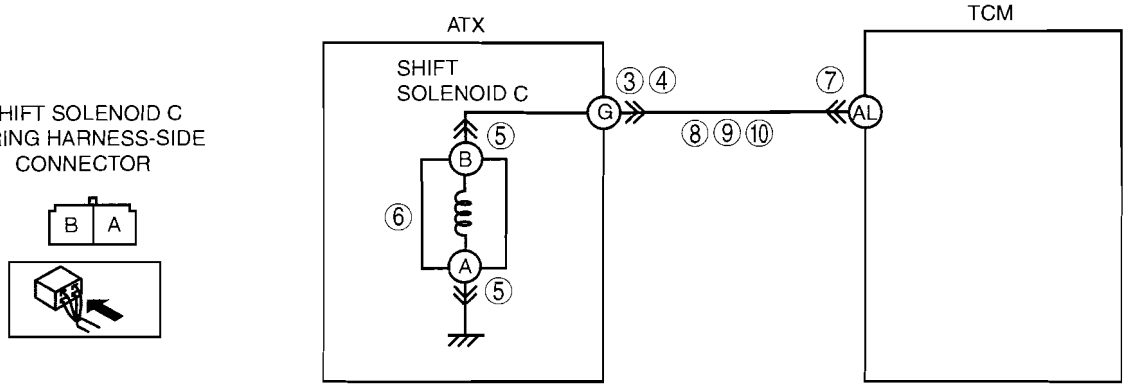
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **26 km/h {16 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

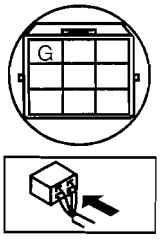
DTC P0763[FS5A-EL]

id050221808900

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	• If the TCM detects either of the following conditions, the TCM determines that shift solenoid C circuit has a malfunction. — Shift solenoid C voltage stuck at **B+** after engine start — Shift solenoid C voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid C malfunction • Short to ground in wiring harness between transaxle connector (primary) terminal G and TCM terminal AL • Short to power supply in wiring harness between transaxle connector (primary) terminal G and TCM terminal AL • Open circuit in wiring harness between shift solenoid C terminal B and transaxle connector (primary) terminal G • Open circuit in wiring harness between transaxle connector (primary) terminal G and TCM terminal AL • Open circuit in wiring harness between shift solenoid C terminal A and body ground • Damaged connector between shift solenoid C and TCM • TCM malfunction

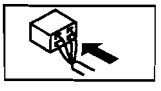


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminal G (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid C connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid C terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid C installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AL (wiring harness-side) and transaxle connector (primary) terminal G (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal G (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AL (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.

STEP	INSPECTION		ACTION
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0766[FS5A-EL]

id050221809000

DTC P0766	Shift solenoid D stuck off
DETECTION CONDITION	• When any of DTC P0732, and P0733 not output (correct judgment), and all conditions below are satisfied. — Is DTC P0731 not output while driving in 1GR at D range — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Vehicle speed **28 km/h {17 mph} or more** — Throttle opening angle at closed throttle position — Revolution ratio of forward clutch drum revolution to secondary gear revolution **0.6 or less** or **1.249 or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Throttle opening angle (THOP PID): **0%** (4GR only) — Vehicle speed (VSS PID): **28 km/h {17 mph} or more.** (4GR only) • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0767[FS5A-EL]

id050221809100

DTC P0767	Shift solenoid D stuck on
DETECTION CONDITION	• When any of DTC P0731, P0732, P0734, and P0741 are not output, and all conditions below are satisfied. — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 3GR at D or M range — Turbine speed **within 225—4,987 rpm** — Differential gear case (output) revolution speed **35 rpm or more** — Revolution ratio of forward clutch drum revolution to secondary gear revolution **0.863 or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid D stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

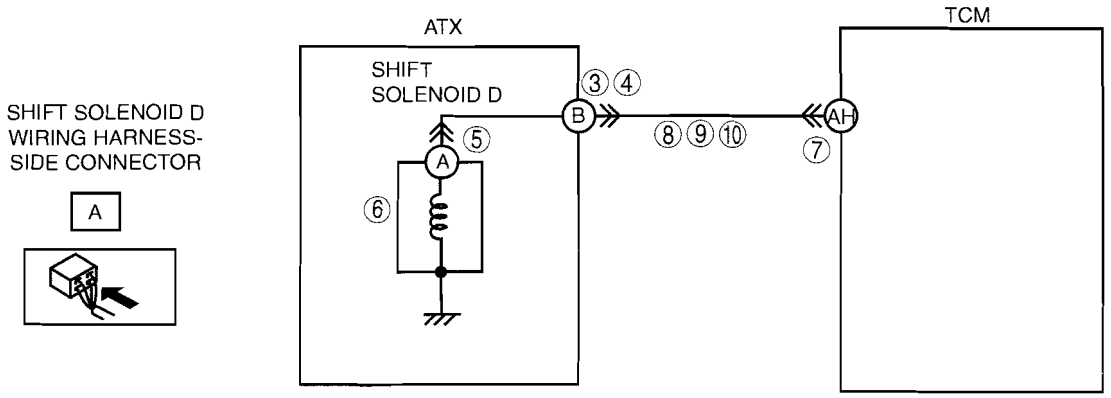
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 3GR • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

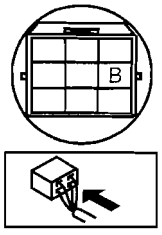
DTC P0768[FS5A-EL]

id050221807000

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions while driving in 4GR at D range, the TCM determines that shift solenoid D circuit has a malfunction. — Shift solenoid D voltage stuck at **B+** after engine start — Shift solenoid D voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid D malfunction • Short to ground in wiring harness between transaxle connector (primary) terminal B and TCM terminal AH • Short to power supply in wiring harness between transaxle connector (primary) terminal B and TCM terminal AH • Open circuit in wiring harness between shift solenoid D terminal A and transaxle connector (primary) terminal B • Open circuit in wiring harness between transaxle connector (primary) terminal B and TCM terminal AH • Damaged connector between shift solenoid D and TCM • TCM malfunction

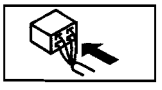


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminal B (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid D connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid D terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid D installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AH (wiring harness-side) and transaxle connector (primary) terminal B (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal B (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AH (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0771[FS5A-EL]

id050221809200

DTC P0771	Shift solenoid E stuck off
DETECTION CONDITION	• When any of DTC P0732, and P0734 are not output, and all conditions below are satisfied. — Is DTC P0731 not output while driving in 1GR at D range — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D range — Turbine speed **within 225—4,987 rpm** — Vehicle speed **within 60—100 km/h {37—62 mph}** — Torque converter clutch (TCC) operating — Shift solenoid A duty value exceeds **99%** — Difference between engine speed and turbine speed **more than 100 rpm** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck off • Control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **within 60—100 km/h {37—62 mph}** (4GR only). • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0772[FS5A-EL]

id050221809300

DTC P0772	Shift solenoid E stuck on
DETECTION CONDITION	• When any of DTC P0731, P0733, and P0734 are not output, and all of the following conditions are satisfied under each of the following throttle conditions. — Engine running — ATF temperature **20 °C {68 °F} or more** — Driving in 4GR at D or M range — Turbine speed **within 225—4,987 rpm** — Vehicle speed **70 km/h {43 mph} or less** — Torque converter clutch (TCC) not operating — Difference between engine speed and turbine speed **50 rpm or less** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0773, P0791 — Throttle conditions • Throttle opening angle (THOP PID) is **6.25% or more** and **5 s or more** have passed • Throttle opening angle (THOP PID) is **within 3.13—6.25%** and **3 s or more** have passed • Throttle opening angle is at closed throttle position and **5 s or more** have passed **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid E stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

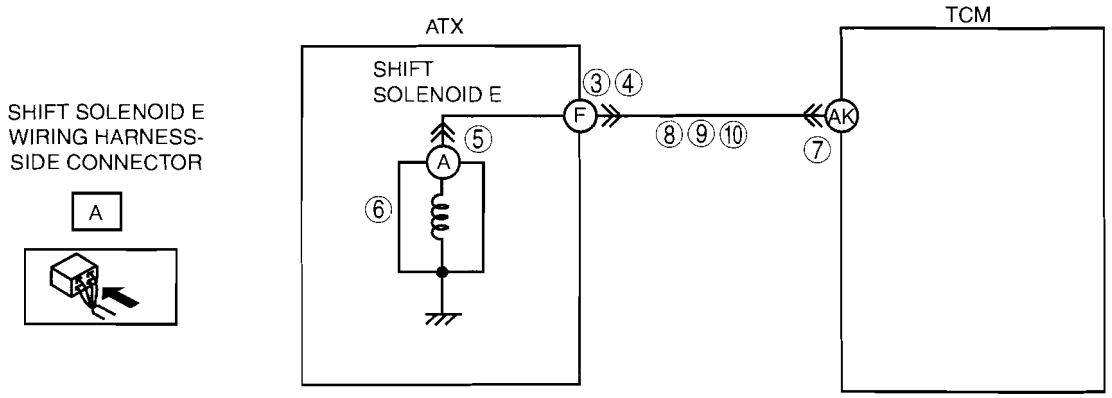
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the primary control valve body. • Disassemble the primary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range — Vehicle speed (VSS PID): **70 km/h {43 mph} or less** (4GR only) • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

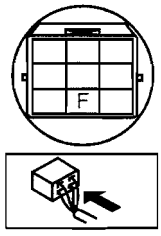
DTC P0773[FS5A-EL]

id050221809400

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions while driving in 4GR at D range with TCC operating, TCM determines that shift solenoid E circuit has a malfunction. — Shift solenoid E voltage stuck at **B+** after engine start — Shift solenoid E voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid E malfunction • Short to ground in wiring harness between transaxle connector (primary) terminal F and TCM terminal AK • Short to power supply in wiring harness between transaxle connector (primary) terminal F and TCM terminal AK • Open circuit in wiring harness between shift solenoid E terminal A and transaxle connector (primary) terminal F • Open circuit in wiring harness between transaxle connector (primary) terminal F and TCM terminal AK • Damaged connector between shift solenoid E and TCM • TCM malfunction

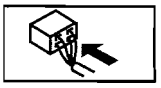


TRANSAXLE CONNECTOR (PRIMARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (primary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (primary) terminal F (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid E connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid E terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid E installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-32 SOLENOID VALVE REMOVAL/ INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AK (wiring harness-side) and transaxle connector (primary) terminal F (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (primary) terminal F (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AK (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0777[FS5A-EL]

id050221810400

DTC P0777	Pressure control solenoid B stuck on
DETECTION CONDITION	• With the engine running, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle **2.77% or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0778, P0791, P2707, P2708, P2709 — Revolution ratio of the secondary gear and differential gear case is **1.11 or more** when driving in 5GR. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Pressure control solenoid B stuck on • Control valve stuck • TCM malfunction

Diagnostic procedure

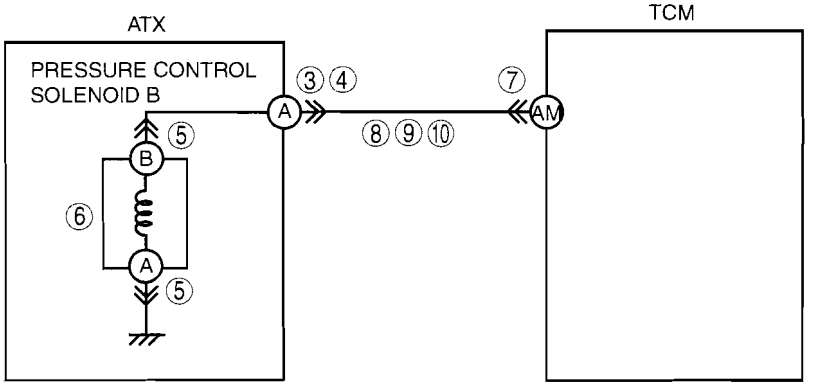
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

STEP	INSPECTION		ACTION
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the secondary control valve body. • Disassemble the secondary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P0777 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 5GR: — ATF temperature (TFT PID) (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **2.77% or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

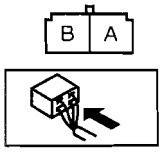
DTC P0778[FS5A-EL]

id050221810500

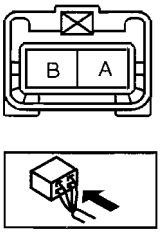
DTC P0778	Pressure control solenoid B malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions, TCM determines that pressure control solenoid B circuit has a malfunction. — Pressure control solenoid B voltage stuck at **B+** after engine start — Pressure control solenoid B voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Pressure control solenoid B malfunction • Short to ground in wiring harness between transaxle connector (secondary) terminal A and TCM terminal AM • Short to power supply in wiring harness between transaxle connector (secondary) terminal A and TCM terminal AM • Open circuit in wiring harness between pressure control solenoid B terminal B and transaxle connector (secondary) terminal A • Open circuit in wiring harness between transaxle connector (secondary) terminal A and TCM terminal AM • Open circuit in wiring harness between pressure control solenoid B terminal A and body ground • Damaged connector between pressure control solenoid B and TCM • TCM malfunction



PRESSURE CONTROL SOLENOID B WIRING HARNESS-SIDE CONNECTOR

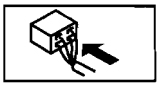


TRANSAXLE CONNECTOR (SECONDARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

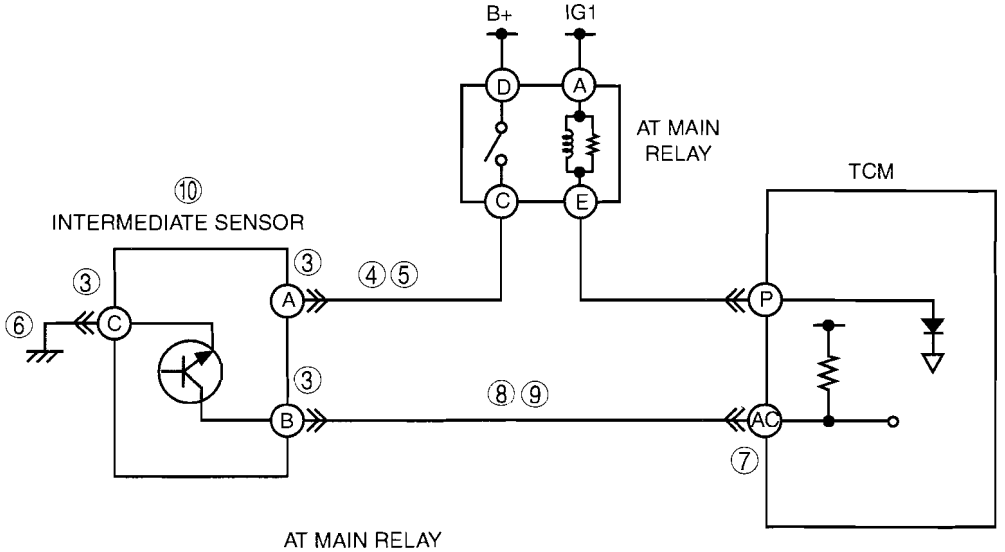
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (secondary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (secondary) terminal A (transaxle case side) and body ground. • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT PRESSURE CONTROL SOLENOID B CONNECTOR FOR POOR CONNECTION** • Disconnect the pressure control solenoid B connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between pressure control solenoid B terminals A and B (part-side). • Is the resistance **within 1.0—4.2 ohms**? (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift pressure control solenoid B installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-34 SOLENOID VALVE REMOVAL/ INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AM (wiring harness-side) and transaxle connector (secondary) terminal A (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (secondary) terminal A (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.

STEP	INSPECTION		ACTION
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AM (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.
11	**VERIFY TROUBLESHOOTING OF DTC P0778 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 5GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

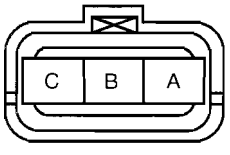
DTC P0791[FS5A-EL]

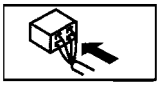
id050221810600

DTC P0791	Intermediate sensor circuit malfunction
DETECTION CONDITION	• Secondary gear revolution speed signal is not input after the following conditions are met and **4.5 s or more** have passed. — D range selected — Engine coolant temperature **60 °C {140 °F} or more** — Engine speed **500 rpm or more** — Vehicle speed **40 km/h {25 mph} or more** **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Intermediate sensor malfunction • Open circuit in wiring harness between intermediate sensor terminal B and TCM terminal AC • Short to ground in wiring harness between intermediate sensor terminal B and TCM terminal AC • Open circuit in wiring harness between intermediate sensor terminal A and AT main relay terminal C • Short to ground in wiring harness between intermediate sensor terminal A and AT main relay terminal C • Open circuit in wiring harness between intermediate sensor terminal C and body ground • Damaged connectors between intermediate sensor and TCM • TCM malfunction

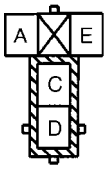


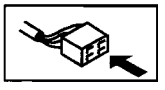
INTERMEDIATE SENSOR WIRING HARNESS-SIDE CONNECTOR





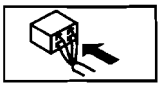
AT MAIN RELAY WIRING HARNESS-SIDE CONNECTOR





TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

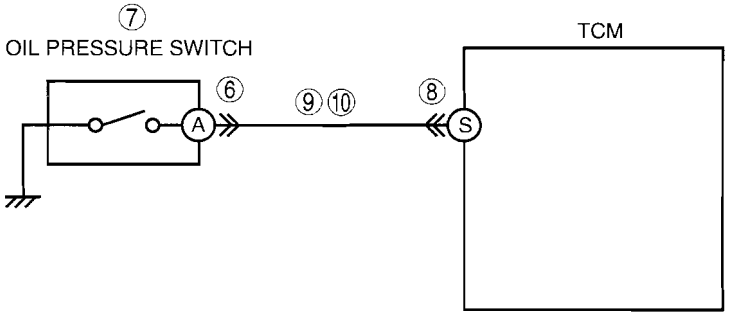
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT INTERMEDIATE SENSOR CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the intermediate sensor connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
4	**INSPECT INTERMEDIATE SENSOR POWER CIRCUIT FOR OPEN CIRCUIT** • Verify that the intermediate sensor connector is disconnected. • Turn the ignition switch to the ON position (engine off). • Inspect the voltage between intermediate sensor terminal A (wiring harness-side) and ground. • Is the voltage **B+**?	Yes	Go to Step 6.
		No	Go to the next step.
5	**INSPECT INTERMEDIATE SENSOR POWER CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between intermediate sensor terminal A (wiring harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
6	**INSPECT INTERMEDIATE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that the intermediate sensor connector is disconnected. • Inspect for continuity between intermediate sensor (wiring harness-side) terminal C and ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the pin or connector, then go to Step 11.
8	**INSPECT SECONDARY GEAR REVOLUTION SPEED SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Disconnect the TCM connector and intermediate sensor connector. • Inspect for continuity between intermediate sensor terminal B and TCM terminal AC. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT SECONDARY GEAR REVOLUTION SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verity that the intermediate sensor connector and TCM connector are disconnected. • Inspect for continuity between TCM terminal AC and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Replace the intermediate sensor, then go to the next step. (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/ INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
10	**INSPECT INTERMEDIATE SENSOR** • Inspect the intermediate sensor. (See 05-17B-25 INTERMEDIATE SENSOR INSPECTION[FS5A-EL].) • Is intermediate sensor normal?	Yes	Go to the next step.
		No	Repair or replace the intermediate sensor, then go to the next step. (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
11	**VERIFY TROUBLESHOOTING OF DTC P0791 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up engine. • Drive the vehicle under the following conditions for **4.5 s or more** while monitoring PIDs. — Engine coolant temp (ECT PID): **60 °C {140 °F} or more** — Drive in D range — Vehicle speed (VSS PID): **40 km/h {25 mph} or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

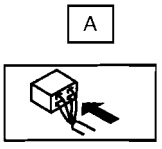
DTC P0841[FS5A-EL]

id050221809500

DTC P0841	Oil pressure switch circuit malfunction
DETECTION CONDITION	• When DTC P0731, P0732, P0733 and P0734 are not output and **10 s or more** has passed. — When all the conditions below are satisfied while driving in 1GR, 2GR or 3GR • ATF temperature **20 °C {68 °F} or more** • Oil pressure switch OFF • Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.91—3.07** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 — When all conditions below are satisfied while driving in 4GR or 5GR • ATF temperature **20 °C {68 °F} or more** • Oil pressure switch ON • Revolution ratio of forward clutch drum revolution to differential gear case revolution **within 0.64—0.81** • None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773, P0791 **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light does not illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Line pressure low • Oil pressure switch malfunction • Open circuit in wiring harness between oil pressure switch terminal A and TCM terminal S • Short to ground in wiring harness between oil pressure switch terminal A and TCM terminal S • Damaged connector between oil pressure switch and TCM • Control valve stuck • TCM malfunction

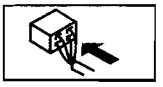


OIL PRESSURE SWITCH WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

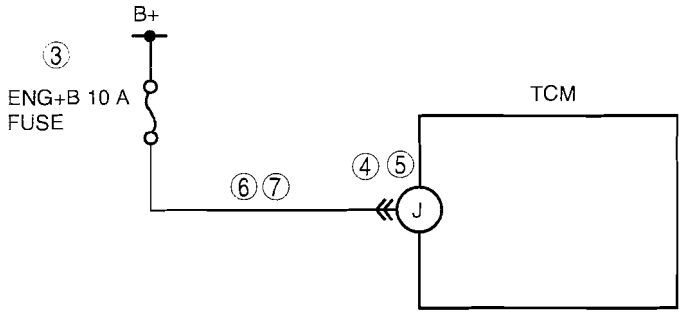
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair Information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Inspect the ATF condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) • Is it normal?	Yes	Go to the next step.
		No	Replace the ATF, then go to Step 11.
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 11. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 11. Any ranges: Replace the primary control valve body, then go to Step 11. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
6	**INSPECT OIL PRESSURE SWITCH CONNECTOR FOR POOR CONNECTION** • Disconnect the shift oil pressure switch connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step11.
7	**INSPECT CONTINUITY** • Inspect for continuity between oil pressure switch terminal A (part-side) and body ground. • Is there continuity?	Yes	Replace the oil pressure switch, then go to Step 11. (See 05-17B-23 OIL PRESSURE SWITCH REMOVAL/ INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
9	**INSPECT OIL PRESSURE SWITCH CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal S (wiring harness-side) and transaxle connector terminal A (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal S (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Replace the oil pressure switch, then go to the next step. (See 05-17B-23 OIL PRESSURE SWITCH REMOVAL/ INSTALLATION[FS5A-EL].)

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P0841 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle and make sure that gears shift smoothly from 1GR to 5GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P0882[FS5A-EL]

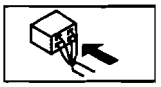
id050221802800

DTC P0882	Battery back-up power supply circuit
DETECTION CONDITION	• When the signal of the battery back-up power supply circuit is **less than 2.5 V**. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the TCM detects the above malfunction condition during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light not illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Melted ENG+B 10 A fuse • Open circuit in wiring harness between battery positive terminal and TCM terminal J • Short to ground in wiring harness between battery positive terminal and TCM terminal J • Poor connection of TCM connector • TCM malfunction



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and or/on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT FUSE** • Turn the ignition switch to the LOCK position. • Inspect ENG+B 10 A fuse malfunction. • Is it normal?	Yes	Go to the next step.
		No	• If fuse has been melted, go to the next step. • If fuse is not installed correctly, install it correctly, then go to Step 13.

STEP	INSPECTION		ACTION
4	**INSPECT VOLTAGE OF POWER SUPPLY CIRCUIT** • Turn the ignition switch to the ON position (engine off). • Inspect for voltage TCM connector terminal J (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Go go to Step 6.
5	**INSPECT TERMINAL TCM CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable. • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Are terminals normal?	Yes	Go go to Step 8.
		No	Replace the couple component, then go to Step 8.
6	**INSPECT POWER SUPPLY CIRCUIT FOR SHORT TO GROUND** • Disconnect the positive battery cable. • Inspect for continuity between the TCM terminal J and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Go to the next step.
7	**INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal J and ENG+B 10 A fuse terminal (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.
8	**VERIFY TROUBLESHOOTING OF DTC P0882 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02B-9 DTC TABLE[FS5A-EL].)
		No	Troubleshooting completed.

DTC P0883[FS5A-EL]

id050221802900

DTC P0883	Battery voltage high
DETECTION CONDITION	• Voltage of **16 V or more** detected at TCM terminal 1J. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Generator malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY DTC** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTC in the TCM memory. • Are DTC P2504 output?	Yes	Go to the applicable DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].)
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING OF DTC P0883 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine and warm it up completely. • Is same DTC present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
5	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See 05-02B-9 DTC TABLE[FS5A-EL].)
		No	DTC troubleshooting completed.

DTC P0894[FS5A-EL]

id050221809600

DTC P0894	Forward clutch power transmission malfunction
DETECTION CONDITION	• With the engine running, all of the following conditions are met: — ATF temperature **20 °C {68 °F} or more** — Vehicle speed **0 km/h {0 mph}** (brake on) — Even when **3 s or more** have passed since the selector lever was shifted from the N position to the D range, the turbine speed will not decrease to less than 187 rpm. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the TCM detects above malfunction conditions during the first drive cycle. • A PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • DTCs are stored in the TCM memory.
POSSIBLE CAUSE	• Forward clutch not engaged or slipped • Short to power supply in wiring harness between shift solenoid A terminal B and TCM terminal AG • Shift solenoid A stuck on • VSS malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY DTCS** • Turn the ignition switch to the LOCK position, then to the ON position. • Verify the DTCs in the TCM memory. • Are DTCs P0720, P0752, and P0753 output?	Yes	Go to the applicable DTC inspection.
		No	Replace the forward clutch, then go to the next step.
3	**VERIFY TROUBLESHOOTING OF DTC P0894 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Warm up the engine. • With the selector lever in the D range and the vehicle stopped (brake on), wait **3 s or more**. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
4	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P1783[FS5A-EL]

id050221807700

DTC P1783	ATF high oil temperature malfunction
DETECTION CONDITION	• When all conditions below are satisfied. — P0712, P0713 not output — ATF temperature **149.5 °C {301°F} or more** — ATF oil temperature signal of **0.06 V or more** is input to TCM terminal U. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL does not illuminate if the TCM detects above malfunction conditions during the first drive cycle. • The PENDING CODE is not available. • FREEZE FRAME DATA is not available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• High engine load drive (Driving a steep gradient at a low speed.) • Insufficient or excess level of ATF • Deteriorated ATF • TFT sensor circuit malfunction • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY VEHICLE DRIVING CONDITIONS** • Verify each PID monitor of the HTM_CNT and HTM_DIS. • Verify vehicle driving conditions when a DTC P1783 is output. • Has the vehicle been driven at a high engine load?	Yes	• Go to Step 6. • Inform the customer that the ATX temperature is high due to high engine load driving.
		No	Go to the next step.
4	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 6. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
5	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to the next step. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
6	**VERIFY TROUBLESHOOTING OF DTC P1783 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P2707[FS5A-EL]

id050221810700

DTC P2707	Shift solenoid F stuck off
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle **2.77% or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0777, P0778, P0791, P2708, P2709 — Revolution ratio of the secondary gear and the differential gear case is **1.11 or less** when driving in 3GR or 4GR. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid F stuck off • Secondary control valve stuck • TCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)

STEP	INSPECTION		ACTION
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the secondary control valve body. • Disassemble the secondary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P2707 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 5GR: — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 4GR — Throttle opening angle (THOP PID): **2.77% or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC P2708[FS5A-EL]

id050221810800

DTC P2708	Shift solenoid F stuck on
DETECTION CONDITION	• When all conditions below are satisfied. — ATF temperature **20 °C {68 °F} or more** — Turbine speed **within 225—4,987 rpm** — Secondary gear revolution speed **50 rpm or more** — Differential gear case (output) revolution speed **35 rpm or more** — Throttle opening angle **2.77% or more** — None of the following DTCs are present: P0706, P0707, P0708, P0712, P0713, P0715, P0720, P0777, P0778, P0791, P2707, P2709 — Revolution ratio of the secondary gear and differential gear case is **1.11 or more** when driving in 5GR. **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoid F stuck on • Secondary control valve stuck • TCM malfunction

Diagnostic procedure

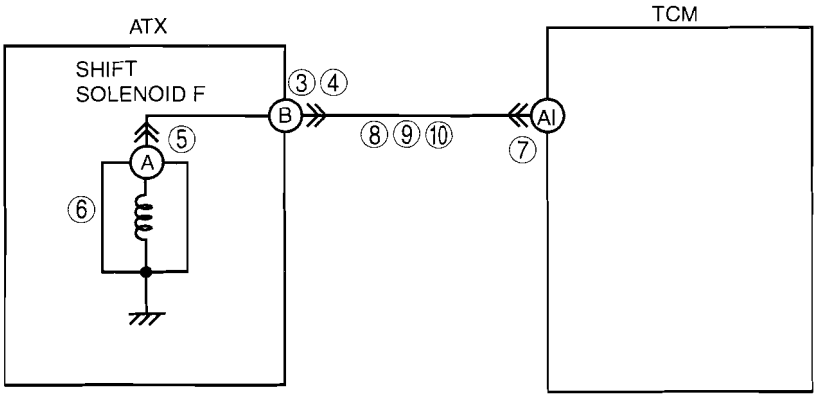
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT ATF CONDITION** • Turn the ignition switch to the LOCK position. • Inspect the ATF condition. — Clear red: Normal — Milky: Water mixed in fluid — Reddish brown: Deteriorated ATF • Is it normal? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 5. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4	**INSPECT ATF LEVEL** • Start the engine. • Warm up the ATX. • Is the ATF level within the specification? (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5	**INSPECT LINE PRESSURE** • Start the engine. • Measure the line pressures. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) • Are the line pressures within the specifications?	Yes	Go to the next step.
		No	• All ranges: Replace the oil pump or control valve body, then go to Step 7. • Any ranges: Replace the automatic transaxle, then go to Step 7. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)

STEP	INSPECTION		ACTION
6	**INSPECT OPERATION OF EACH VALVE AND EACH SPRING** • Turn the ignition switch to the LOCK position. • Remove the secondary control valve body. • Disassemble the secondary control valve body. • Is each valve operation normal and is the return spring normal? (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)	Yes	Replace the automatic transaxle, then go to the next step. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
		No	Repair or replace the shift valve and return spring, then go to the next step. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].) (See ATX Workshop Manual FS5A-EL.)
7	**VERIFY TROUBLESHOOTING OF DTC P2708 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Start the engine. • Warm up the ATX. • Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 5GR. — ATF temperature (TFT PID): **20 °C {68 °F} or more** — Drive in the D range, 5GR — Throttle opening angle (THOP PID): **2.77% or more** • Is the PENDING CODE present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

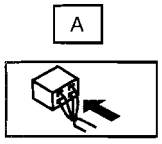
DTC P2709[FS5A-EL]

id050221810900

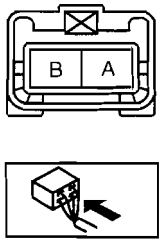
DTC P2709	Shift solenoid F malfunction (electrical)
DETECTION CONDITION	• If TCM detects either of the following conditions while driving in 5GR at D range, the TCM determines that shift solenoid F circuit has a malfunction. — Shift solenoid F voltage stuck at **B+** after engine start — Shift solenoid F voltage stuck at **0 V** after engine start **Diagnostic support note:** • This is a continuous monitor (CCM). • The MIL illuminates if the TCM detects the above malfunction conditions during the first drive cycle. • The PENDING CODE is available if the TCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA is available. • The AT warning light illuminates. • The DTC is stored in the TCM memory.
POSSIBLE CAUSE	• Shift solenoid F malfunction • Short to ground in wiring harness between transaxle connector (secondary) terminal B and TCM terminal AI • Short to power supply in wiring harness between transaxle connector (secondary) terminal B and TCM terminal AI • Open circuit in wiring harness between shift solenoid F terminal A and transaxle connector (secondary) terminal B • Open circuit in wiring harness between transaxle connector (secondary) terminal B and TCM terminal AI • Damaged connector between shift solenoid F and TCM • TCM malfunction



SHIFT SOLENOID F WIRING HARNESS-SIDE CONNECTOR

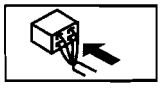


TRANSAXLE CONNECTOR (SECONDARY) WIRING HARNESS-SIDE CONNECTOR



TCM WIRING HARNESS-SIDE CONNECTOR

AL	AJ	AG	AD	AA	X	U	R	O	L	I	F	C	A
AM	AK	AH	AE	AB	Y	V	S	P	M	J	G	D	B
		AI	AF	AC	Z	W	T	Q	N	K	H	E	



Diagnostic procedure

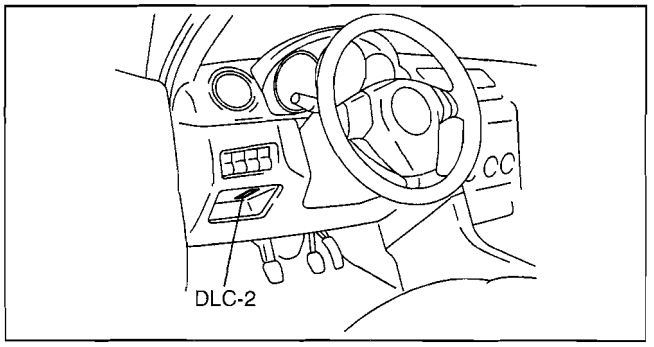
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**INSPECT TRANSAXLE CONNECTOR FOR POOR CONNECTION** • Turn the ignition switch to the LOCK position. • Disconnect the transaxle connector (secondary). • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
4	**INSPECT RESISTANCE** • Inspect the resistance between transaxle connector (secondary) terminal B (transaxle case side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Go to Step 7.
		No	Go to the next step.
5	**INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION** • Disconnect the shift solenoid F connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
6	**INSPECT RESISTANCE** • Inspect the resistance between shift solenoid F terminal A (part-side) and body ground. • Is the resistance **within 10.9—26.2 ohms**? (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)	Yes	Replace the solenoid wiring harness, then go to Step 11.
		No	Verify shift solenoid F installation. • If solenoid installed correctly, replace the solenoid, then go to Step 11. (See 05-17B-34 SOLENOID VALVE REMOVAL/ INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)
7	**INSPECT TCM CONNECTOR FOR POOR CONNECTION** • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/ pulled-out pins, corrosion). • Is the connection normal?	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminals, then go to Step 11.
8	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between TCM terminal AI (wiring harness-side) and transaxle connector (secondary) terminal B (wiring harness-side). • Is there continuity between terminals?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
9	**INSPECT TRANSAXLE CONNECTOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (engine off). • Inspect the voltage at transaxle connector (secondary) terminal B (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 11.
10	**INSPECT TCM CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between TCM terminal AI (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 11.
		No	Go to the next step.

STEP	INSPECTION		ACTION
11	**VERIFY TROUBLESHOOTING OF DTC P2709 COMPLETED** • Make sure to reconnect all the disconnected connectors. • Clear the DTC from the memory using the M-MDS. • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 5GR. • Are any DTCs present?	Yes	Replace the TCM, then go to the next step. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
		No	No concern is detected. Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "After Repair Procedure". (See 05-02B-4 AFTER REPAIR PROCEDURE[FS5A-EL].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

PID/DATA MONITOR INSPECTION[FS5A-EL]

id050221805600

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "TCM".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "TCM".
     3. Select "DataLogger".
3. Select the PID from the PID table
4. Verify the PID data according to the directions on the M-MDS screen.



am3uuw0000005

Note

- Perform part inspection for the output device after TCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the TCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using methods such as the simulation function.

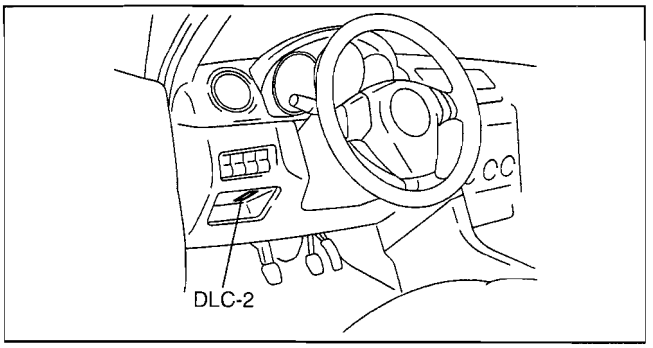
PID/DATA MONITOR AND RECORD function table

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	TCM terminal
DTCCNT (Number of DTC detected)	N/A		• DTCs is detected: 1—255 • No DTCs are detected: 0	Perform applicable DTC troubleshooting. (See 05-02B-9 DTC TABLE[FS5A-EL].)	N/A
DWN SW (Down switch)	On/Off		• M range, downshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	F
ECT TCM (ECT sensor)	°C	°F	Indicates engine coolant temperature	Inspect the ECT sensor. (See 01-40A-49 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION[LF, L3].) Inspect the PCM (See 01-40A-13 PCM INSPECTION[LF, L3].)	N/A
GEAR_SEL	1/2/3/4/5		• 1GR: 1 • 2GR: 2 • 3GR: 3 • 4GR: 4 • 5GR: 5	Inspect the following PIDs: SSA/SS1, SSB/SS2, SSC/SS3, SSD/SS4, SSE_SS5, SSF_SS6	N/A
HTM_CNT	N/A		Indicates number of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) operations • 0—65,535	N/A	N/A
HTM_DIS	km		Indicates travel distance after operation of high oil temperature mode (ATF temperature at 130 °C {266 °F} or more) • 0—65,535 km	N/A	N/A
ISS (Intermediate shaft speed)	RPM		Indicates secondary gear revolution speed • Vehicle speed **0 km/h {0 mph}: 0 RPM** • Vehicle speed **25 km/h {16 mph}: 200—230 RPM**	Inspect the intermediate sensor. (See 05-17B-25 INTERMEDIATE SENSOR INSPECTION[FS5A-EL].)	AC
LINEDES	kPa	inHg	Indicates target line pressure	Inspect the following PIDs: ISS, OSS, TFT, TFTV, THOP, TR, TSS	N/A
LPS (Pressure control solenoid A)	A		Change current value according to throttle opening angle	Inspect the pressure control solenoid A. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AD, AE
LPS B (Pressure control solenoid B)	%		• 4GR→ 5GR: **99%** • others: **0%**	Inspect the pressure control solenoid B. (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)	AM
MNL SW (M range switch)	On/Off		• M range: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	K
OP_SW_B (Oil pressure switch)	On/Off		• 1GR, 2GR or 3GR: On • Other: Off	Inspect the oil pressure switch. (See 05-17B-22 OIL PRESSURE SWITCH INSPECTION[FS5A-EL].)	S
OSS (Output shaft speed)	RPM		Indicates output shaft speed • Vehicle speed **0 km/h {0 mph}: 0 RPM** • Vehicle speed 25 km/h {16 mph}: **200—230 RPM**	Inspect the VSS. (See 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].)	Z
RPM_TCM (Engine speed)	RPM		Ignition switch ON: **0 RPM** Idle: **700—800 RPM**	Inspect the TCM. (See 05-17B-36 TCM INSPECTION[FS5A-EL].)	N/A
SSA/SS1 (Shift solenoid A)	%		• 4GR: **99%** • others: **0%**	Inspect the shift solenoid A. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AG

Monitor item (Definition)	Unit/ Condition	Condition/Specification	Action	TCM terminal
SSB/SS2 (Shift solenoid B)	%	• 1GR at D range: **99%** • Others: **0%**	Inspect the shift solenoid B. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AJ
SSC/SS3 (Shift solenoid C)	%	• 1GR/2GR: **99%** • Others: **0%**	Inspect the shift solenoid C. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AL
SSD/SS4 (Shift solenoid D)	On/Off	• P/N position, 4GR at D range, 1GR at M range: On • Others: Off	Inspect the shift solenoid D. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AH
SSE_SS5 (Shift solenoid E)	On/Off	• TCC operating: On • TCC non operating: Off	Inspect the shift solenoid E. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)	AK
SSF_SS6 (Shift solenoid F)	On/Off	• 1GR/2GR/3GR/4GR: On • 5GR: Off	Inspect the shift solenoid F. (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)	AI
TFT (Transaxle fluid temperature)	°C / °F	Indicates transaxle fluid temperature	Inspect the TFT sensor. (See 05-17B-19 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FS5A-EL].)	AA
TFTV (Transaxle fluid signal voltage)	V	• ATF **20 °C {68 °F}: Approx. 3.3 V** • ATF **40 °C {104 °F}: Approx. 2.4 V** • ATF **60 °C {140 °F}: Approx. 1.5 V**	Inspect the TFT sensor. (See 05-17B-19 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FS5A-EL].)	AA
THOP (Throttle position sensor)	%	• CTP: **12%** • WOT: **75%**	Inspect the TP sensor. (See 01-40A-54 THROTTLE POSITION (TP) SENSOR INSPECTION[LF, L3].)	N/A
TR (Transaxle range)	P/R/N/D	• P position: P • R position: R • N position: N • D range: D	Inspect the TR switch. (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	U
TR_SENS (TR switch)	V	• P position: **4.34—4.79 V** • R position: **3.83—4.18 V** • N position: **3.05—3.50 V** • D range: **2.23—2.66 V**	Inspect the TR switch. (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)	U
TSS (Input/turbine speed)	RPM	Indicates Input/turbine speed • Ignition switch ON: **0 RPM** • Idle: **700—800 RPM** (P, N position)	Inspect the input/turbine speed sensor. (See 05-17B-24 INPUT/TURBINE SPEED SENSOR INSPECTION[FS5A-EL].)	Y, AB
UP SW (Up switch)	On/Off	• M range, upshift: On • Other: Off	Inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)	G
VPWR_TCM (Battery voltage)	V	B+	Inspect the main relay. (See 09-21-3 RELAY INSPECTION.)	J
VSS (Vehicle speed)	KPH	• Vehicle speed **20 km/h {12.5 mph}: 20 KPH** • Vehicle speed **40 km/h {25 mph}: 40 KPH**	Inspect the VSS. (See 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].)	Z

Simulation Function Procedure

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "DataLogger".
     - — Select "Modules".
     - — Select "TCM".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "TCM".
     - — Select "DataLogger".
3. Select the simulation items from the PID table.
4. Perform the simulation function, inspect the operations for each parts.
   - If there is no operation sound from the solenoid after the simulation function inspection is performed, it is possible that there is an open or short circuit in the wiring harness, or solenoid, or sticking and operation malfunction.



am3uuw0000005

Simulation item table

X: Available

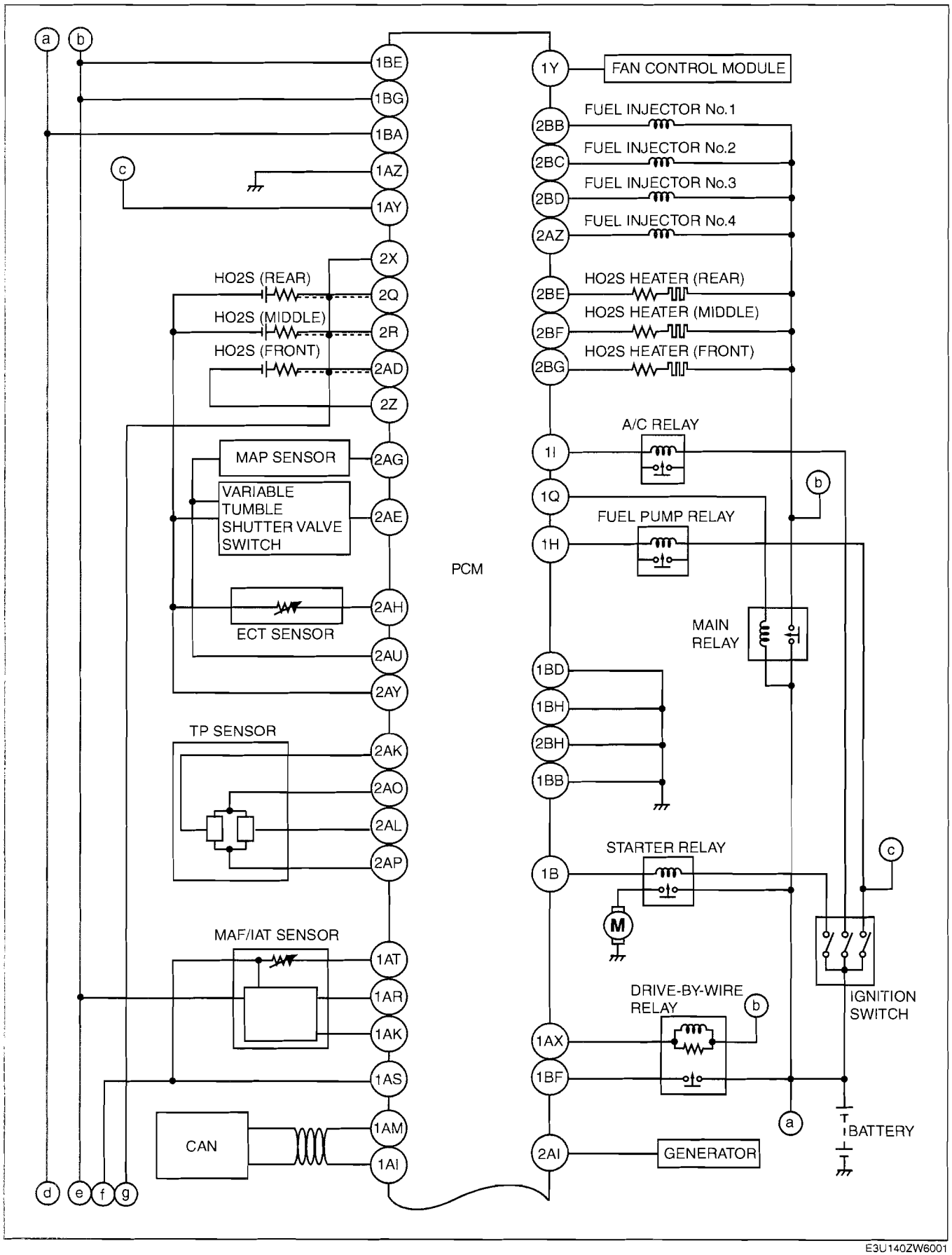
Simulation item	Applicable component	Unit/Condition	Operation		TCM terminal
			IG ON	Idle	
LPS	Pressure control solenoid A	%	N/A	X	AD, AE
LPS B	Pressure control solenoid B	%	N/A	X	AM
SSA/SS1	Shift solenoid A	%	N/A	X	AG
SSB/SS2	Shift solenoid B	%	N/A	X	AJ
SSC/SS3	Shift solenoid C	%	N/A	X	AL
SSD/SS4	Shift solenoid D	On/Off	N/A	X	AH
SSE_SS5	Shift solenoid E	On/Off	N/A	X	AK
SSF_SS6	Shift solenoid F	On/Off	N/A	X	AI

05-03A SYMPTOM TROUBLESHOOTING [FN4A-EL]

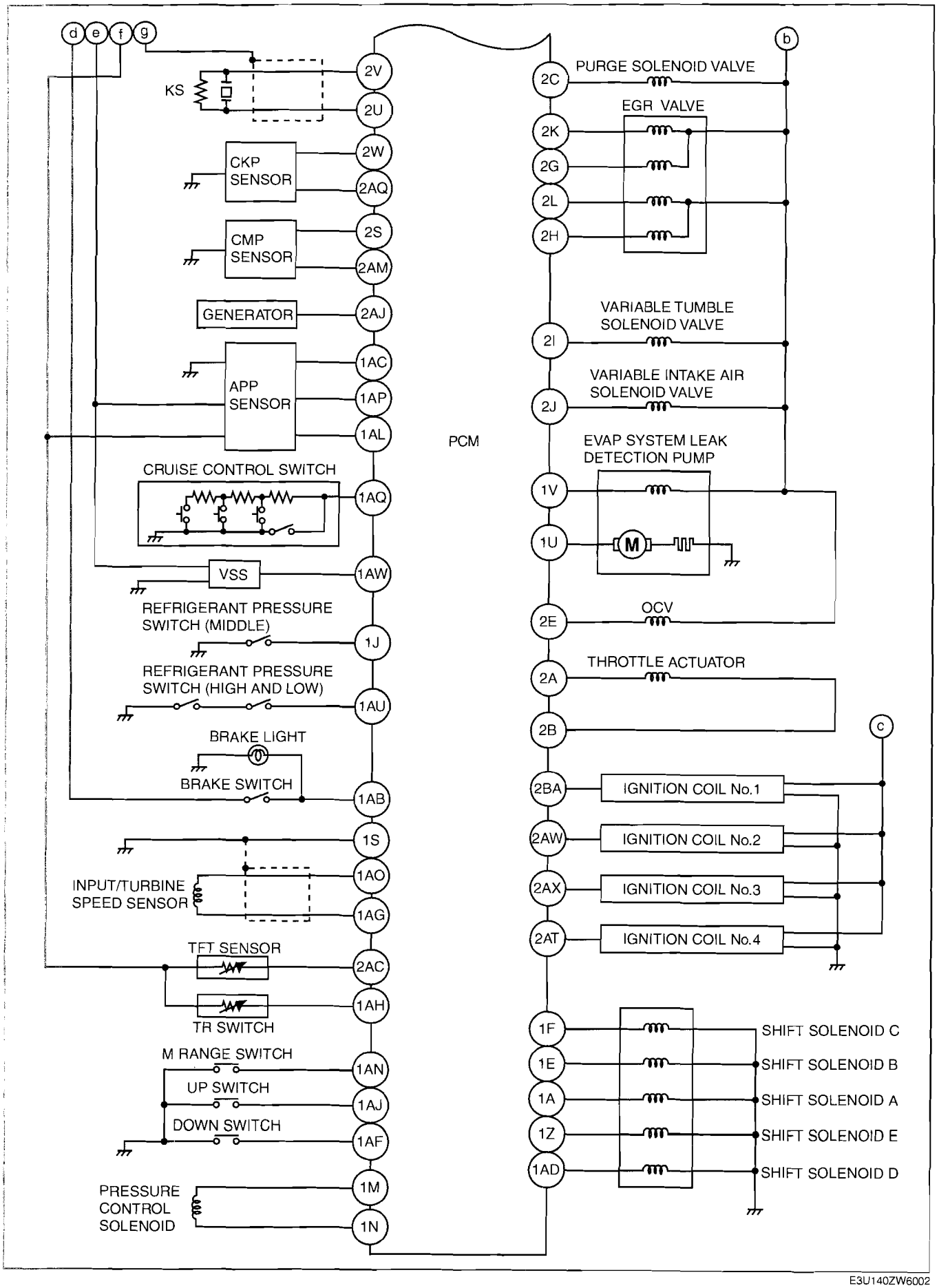
AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FN4A-EL]

id0503a1800100

California Emission Regulation Applicable Model

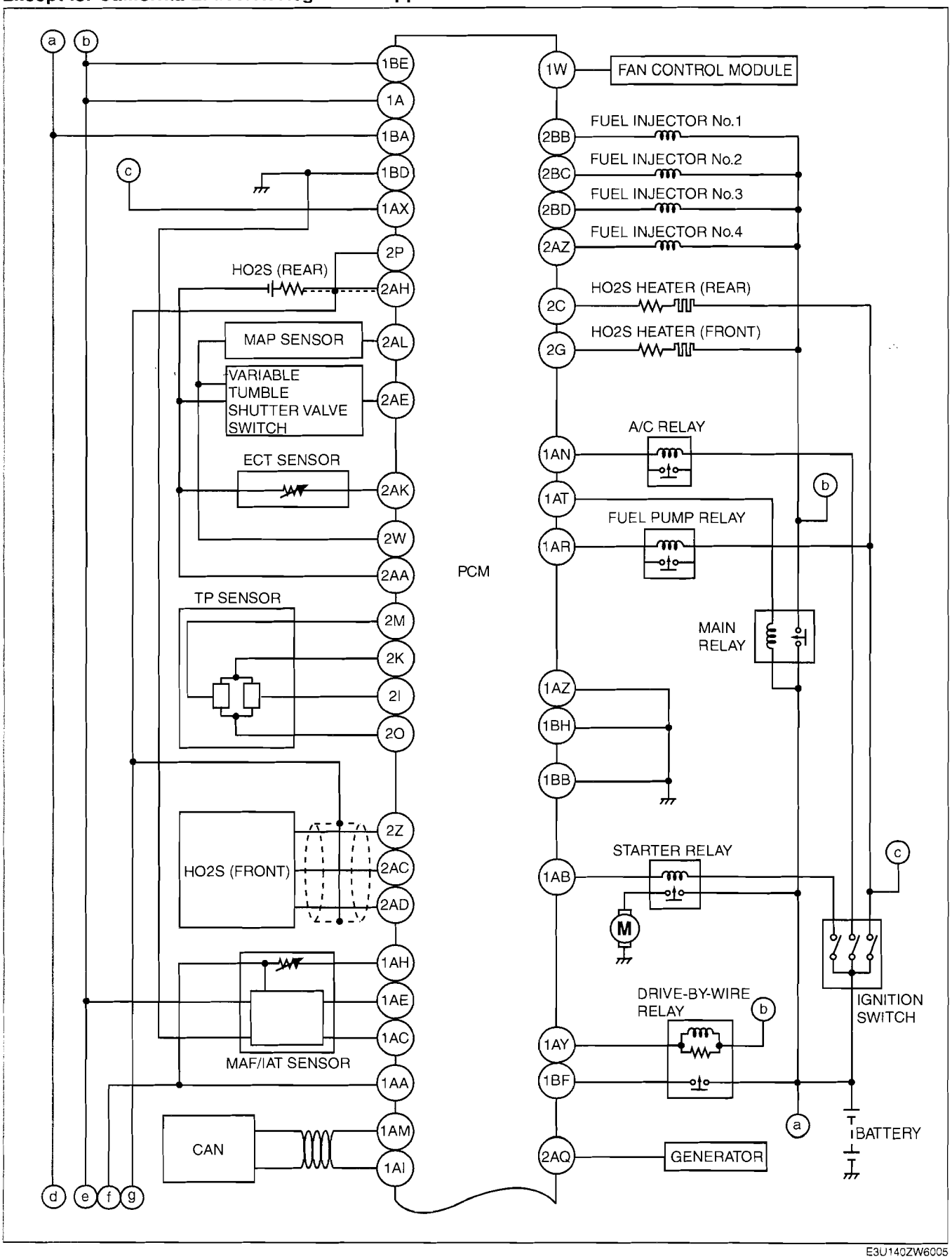


E3U140ZW6001

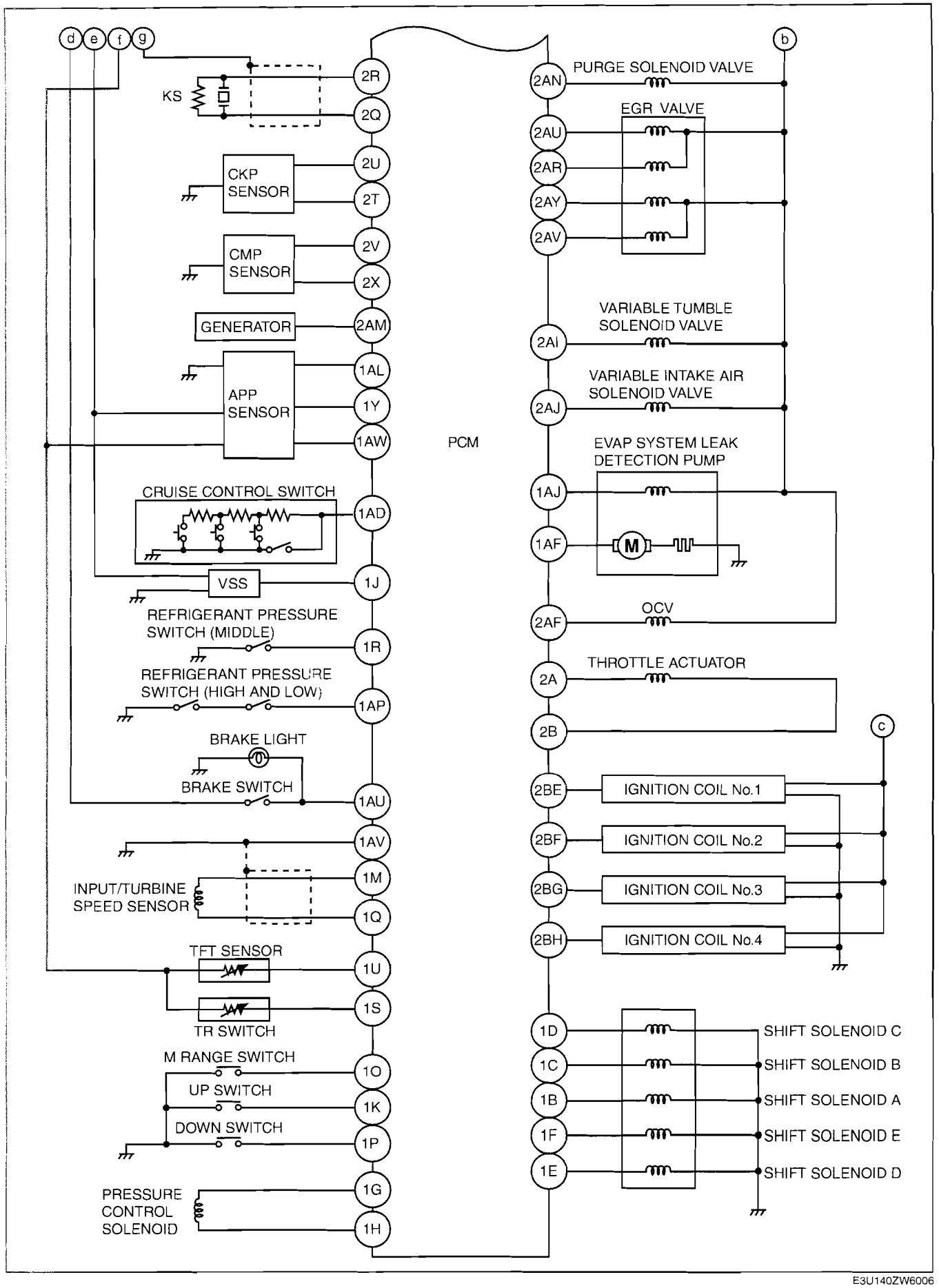


E3U140ZW6002

Except for California Emission Regulation Applicable Model



E3U140ZW6005

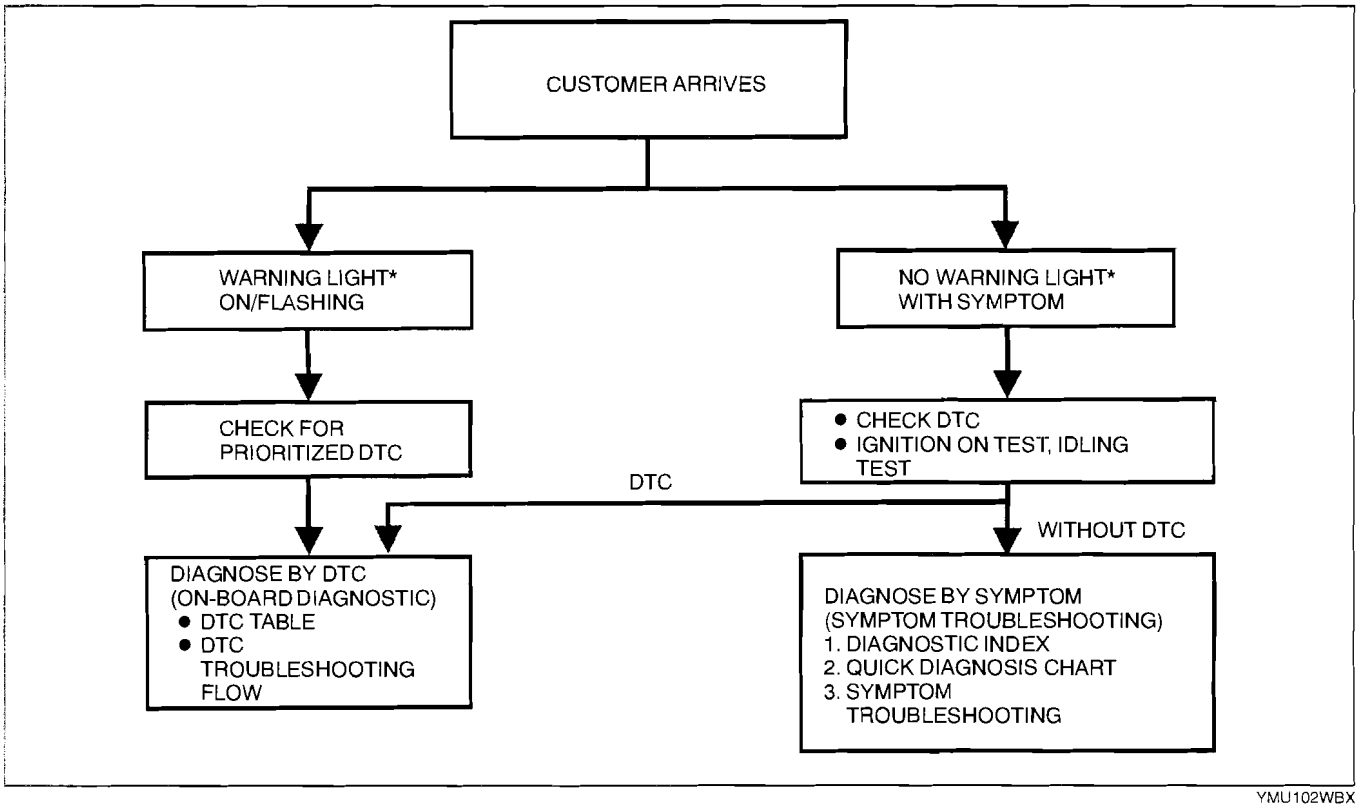


E3U140ZW6006

FOREWORD[FN4A-EL]

id0503a1800200

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication, AT warning light flash, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - — If a DTC exists, diagnose the applicable DTC inspection. (See 05-02A-11 DTC TABLE[FN4A-EL].)
  - — If a DTC does not exist, the MIL does not illuminate and AT warning light illuminate, diagnose the applicable symptom troubleshooting. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)



YMU102WBX

*: Malfunction Indicator Lamp (MIL), AT warning light.

BASIC INSPECTION[FN4A-EL]

id0503a1800300

STEP	INSPECTION		ACTION
1	Perform the mechanical system test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is the mechanical system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
2	Turn the ignition switch to the ON position. When the selector lever is moved, does the gear position indicator light indication correspond to the selector lever position? Also, when other ranges are selected from N or P during idling, does the vehicle move **within 1—2 s**?	Yes	Go to the next step.
		No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-18-3 SELECTOR LEVER INSPECTION.) (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].) If the selector lever and TR switch are normal, go to the next step.
3	Inspect the ATF color and condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) Are the ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result. Flush the ATX and cooler line if necessary.
4	Perform the line pressure test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is the line pressure normal?	Yes	Go to the next step.
		No	Adjust the accelerator cable if necessary. Repair or replace any malfunctioning parts according to the inspection result.

STEP	INSPECTION		ACTION
5	Perform the stall test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
6	Inspect the voltage at the following PCM terminals. (See 01-40A-13 PCM INSPECTION[LF, L3].) • Terminal 2AC*1, 1U*2 (TFT sensor) • Terminal 1AH*1, 1S*2 (TR switch) • Terminal 1AO*1, 1AG*1, 1M*2, 1Q*2 (Input/ TSS) • Terminal 1AF*1, 1P*2 (Down switch) • Terminal 1AJ*1, 1K*2 (Up switch) • Terminal 1AM*1, 1O*2 (M range switch) Is the voltage normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
7	Inspect the value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • B+ • APP1 • APP2 • ECT • RPM • TP1 • VSS Are the PID values normal?	Yes	Perform the symptom troubleshooting and follow the procedures.
		No	Repair or replace any malfunctioning parts according to the inspection result.

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL]

id0503a1800400

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Vehicle does not move in D range, or in R position	Vehicle does not move when accelerator pedal is depressed.	(See 05-03A-13 NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION[FN4A-EL].)
2	Vehicle moves in N position	Vehicle creeps in N position. Vehicle creeps if brake pedal is not depressed in N position.	(See 05-03A-14 NO.2 VEHICLE MOVES IN N POSITION[FN4A-EL].)
3	Vehicle moves in P position, or parking gear does not disengage when P position is disengaged	Vehicle rolls when on a downward slope and tires do not lock in P position. Tires locked when P position is disengaged, vehicle does not move in D range, and R position when accelerator pedal is depressed, and engine remains in stalled condition.	(See 05-03A-14 NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED[FN4A-EL].)
4	Excessive creep	Vehicle accelerates in D range, and R position when accelerator pedal is not depressed.	(See 05-03A-15 NO.4 EXCESSIVE CREEP[FN4A-EL].)
5	No creep at all	Vehicle does not move in D range, or R position when idling on flat paved road.	(See 05-03A-15 NO.5 NO CREEP AT ALL[FN4A-EL].)
6	Low maximum speed and poor acceleration	Vehicle acceleration is poor at start. Delayed acceleration when accelerator pedal is depressed while driving.	(See 05-03A-16 NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION[FN4A-EL].)
7	No shifting	Single shift range only. Sometimes shifts correctly.	(See 05-03A-18 NO.7 NO SHIFTING[FN4A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
8	Does not shift to 4GR	Vehicle does not upshift from 3GR to 4GR even though vehicle speed is increased. Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.	(See 05-03A-19 NO.8 DOES NOT SHIFT TO 4GR[FN4A-EL].)
9	Abnormal shifting	Shifts incorrectly (incorrect shift pattern).	(See 05-03A-20 NO.9 ABNORMAL SHIFTING[FN4A-EL].)
10	Frequent shifting	Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.	(See 05-03A-21 NO.10 FREQUENT SHIFTING[FN4A-EL].)
11	Shift point is high or low	Shift point considerably different from automatic shift diagram. Shift delays when accelerating. Shift occurs suddenly when accelerating and engine speed does not increase.	(See 05-03A-21 NO.11 SHIFT POINT IS HIGH OR LOW[FN4A-EL].)
12	Torque converter clutch (TCC) non-operation	TCC does not operate when vehicle reaches TCC operation range.	(See 05-03A-21 NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION[FN4A-EL].)
13	No kickdown	Does not downshift when accelerator pedal is fully depressed within kickdown range.	(See 05-03A-22 NO.13 NO KICKDOWN[FN4A-EL].)
14	Engine flares up or slips when upshifting or downshifting	When accelerator pedal is depressed, engine speed increases normally but vehicle speed increases slowly. When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.	(See 05-03A-23 NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING[FN4A-EL].)
15	Engine flares up or slips when accelerating vehicle	Engine flares up when accelerator pedal is depressed for upshifting. Engine flares up suddenly when accelerator pedal is depressed for downshifting.	(See 05-03A-24 NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE[FN4A-EL].)
16	Judder upon torque converter clutch (TCC) operation	Vehicle jolts when TCC is engaged.	(See 05-03A-24 NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION[FN4A-EL].)
17	Excessive shift shock from N to D or N to R position/range	Strong shock is felt when shifting from N to D or N to R position/range at idle.	(See 05-03A-25 NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE[FN4A-EL].)
18	Excessive shift shock is given when upshifting and downshifting	Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.	(See 05-03A-27 NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING[FN4A-EL].)
19	Excessive shift shock on torque converter clutch (TCC)	Strong shock is felt when TCC is engaged.	(See 05-03A-28 NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)[FN4A-EL].)
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	Transaxle is noisy in all positions and ranges when vehicle idling.	(See 05-03A-28 NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES[FN4A-EL].)
21	Noise occurs at idle when vehicle is stopped in D range, or in R position	Transaxle is noisy in driving ranges when vehicle is idling.	(See 05-03A-29 NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION[FN4A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
22	No engine braking in 1GR position of M range	Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in M range (1GR) at low vehicle speed.	(See 05-03A-29 NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE[FN4A-EL].)
23	Transaxle overheats	Burnt smell emitted from the transaxle. Smoke is emitted from the transaxle.	(See 05-03A-30 NO.23 TRANSAXLE OVERHEATS[FN4A-EL].)
24	Engine stalls when shifted to D range, or in R position	Engine stalls when shifting from N or P position to D range or R position at idle.	(See 05-03A-31 NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION[FN4A-EL].)
25	Engine stalls when driving at slow speeds or stopping	Engine stalls when brake pedal is depressed while driving at low speed or stopping.	(See 05-03A-31 NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING[FN4A-EL].)
26	Starter does not work	Starter does not work even when in P or N position is selected.	(See 05-03A-31 NO.26 STARTER DOES NOT WORK[FN4A-EL].)
27	Gear position indicator light does not illuminate in D or M range	Gear position indicator light in instrument cluster does not illuminate in D or M range with ignition switch at ON.	(See 05-03A-32 NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE[FN4A-EL].)
28	Gear position indicator light illuminate in P, R and N position	Gear position indicator light in instrument cluster illuminate in P, R and N position with ignition switch at ON.	(See 05-03A-33 NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION[FN4A-EL].)
29	Does not upshift in M range	Gear position indlcator light in instrument cluster illuminates but vehicle does not upshift when selector lever is pushed to "+" side.	(See 05-03A-34 NO.29 DOES NOT UPSHIFT IN M RANGE[FN4A-EL].)
30	Does not downshift in M range	Gear position indicator light in instrument cluster illuminates but vehicle does not downshift when selector lever is pushed to "–" side.	(See 05-03A-34 NO.30 DOES NOT DOWNSHIFT IN M RANGE[FN4A-EL].)

QUICK DIAGNOSIS CHART[FN4A-EL]

id0503a1800500

X : Applied

No.	Item	Selector lever mis-adjusted	Parking mechanism malfunction	Not within line pressure specification	Not within idle speed specification	Excessive amount of ATF	Electrical system components							
							ATX outer parts							
							APP sensor		Input/turbine speed sensor		VSS		ECT sensor	
							No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input
1	Vehicle does not move in D range, or in R position	X		X		X								
2	Vehicle moves in N position	X												
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	X												
4	Excessive creep		X		X	X								
5	No creep at all			X		X	X	X	X	X	X	X		
6	Low maximum speed and poor acceleration		X	X			X	X	X	X	X	X		
7	No shifting			X			X	X	X	X	X	X		
8	Does not shift to 4GR	X		X			X	X	X	X	X	X	X	X
9	Abnormal shifting	X		X		X	X	X	X	X	X	X		
10	Frequent shifting			X			X	X	X	X	X	X		
11	Shift point is high or low					X	X	X	X	X	X	X		
12	Torque converter clutch (TCC) non-operation					X	X	X	X	X	X	X	X	X
13	No kickdown						X	X						
14	Engine flares up or slips when upshifting or downshifting	X		X			X	X	X	X	X	X		
15	Engine flares up or slips when accelerating vehicle	X		X			X	X	X	X	X	X		
16	Judder upon torque converter clutch (TCC) operation			X			X	X	X	X	X	X		
17	Excessive shift shock from N to D or N to R position/range	X		X	X		X	X	X	X	X	X		
18	Excessive shift shock is felt when upshifting and downshifting			X			X	X	X	X	X	X		
19	Excessive shift shock on torque converter clutch (TCC)			X			X	X	X	X	X	X		
20	Noise occurs at idle when vehicle is stopped in all positions/ranges													
21	Noise occurs at idle when vehicle is stopped in D range, or in R position													
22	No engine braking in 1GR position of M range			X			X	X	X	X	X	X		
23	Transaxle overheats			X		X								
24	Engine stalls when shifted to D range, or in R position				X				X	X				
25	Engine stalls when driving at slow speeds or stopping				X									
26	Starter does not work													
27	Gear position indicator light does not illuminate in D or M range						X							
28	Gear position indicator light illuminate in P, R and N position													
29	Does not upshift in M range													
30	Does not downshift in M range													

Symptom / Cause of trouble

am3uuw0000008

X : Applied

No.	Item	Mis-adjusted	Not operating properly	No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input	Always ON	Poor GND	No signal input	Malfunction signal input	Shift solenoid D malfunction
	Symptom / Cause of trouble	TR switch		M range switch		Up switch		Down switch		Brake switch		TFT sensor		
		Electrical system components												
		ATX outer parts												
1	Vehicle does not move in D range, or in R position					X					X			X
2	Vehicle moves in N position													
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged													
4	Excessive creep													
5	No creep at all				X	X					X		X	X
6	Low maximum speed and poor acceleration	X	X	X	X	X					X	X	X	X
7	No shifting					X					X			X
8	Does not shift to 4GR	X	X	X	X						X	X	X	
9	Abnormal shifting	X	X			X					X			X
10	Frequent shifting										X			
11	Shift point is high or low										X			
12	Torque converter clutch (TCC) non-operation	X	X	X	X					X	X	X	X	
13	No kickdown					X					X			X
14	Engine flares up or slips when upshifting or downshifting	X	X			X					X			X
15	Engine flares up or slips when accelerating vehicle	X	X		X	X					X		X	X
16	Judder upon torque converter clutch (TCC) operation				X						X		X	
17	Excessive shift shock from N to D or N to R position/range				X	X					X		X	X
18	Excessive shift shock is felt when upshifting and downshifting			X	X	X					X	X	X	X
19	Excessive shift shock on torque converter clutch (TCC)										X		X	
20	Noise occurs at idle when vehicle is stopped in all positions/ranges				X									
21	Noise occurs at idle when vehicle is stopped in D range, or in R position													
22	No engine braking in 1GR position of M range					X					X			X
23	Transaxle overheats			X	X							X	X	
24	Engine stalls when shifted to D range, or in R position													
25	Engine stalls when driving at slow speeds or stopping													
26	Starter does not work	X	X											
27	Gear position indicator light does not illuminate in D or M range			X										
28	Gear position indicator light illuminate in P, R and N position				X									
29	Does not upshift in M range			X		X	X							
30	Does not downshift in M range			X				X	X					

am3uuw0000008

X : Applied

No.	Item	Shift solenoid E malfunction	Shift solenoid A malfunction	Shift solenoid B malfunction	Shift solenoid C malfunction	Pressure control solenoid malfunction	Control valve is not operating properly	Forward accumulator is not operating properly	Servo apply accumulator is not operating properly	Oil cooler is not operating properly	Slipping (Brake, clutch)	Burnt (Brake, clutch)	Torque converter is not operating properly	TCC burnt Inspection method
	Symptom / Cause of trouble	Electrical system components (ATX inner parts)					Hydraulic system components				Powertrain system			
1	Vehicle does not move in D range, or in R position	X	X	X		X	X				X	X	X	
2	Vehicle moves in N position						X					X		
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged													
4	Excessive creep													
5	No creep at all		X	X	X	X	X				X	X	X	
6	Low maximum speed and poor acceleration	X	X	X	X	X	X				X	X	X	X
7	No shifting	X	X	X	X	X	X				X	X		
8	Does not shift to 4GR	X	X	X			X				X	X		
9	Abnormal shifting	X	X	X	X		X	X	X		X	X	X	
10	Frequent shifting										X	X		
11	Shift point is high or low										X			
12	Torque converter clutch (TCC) non-operation	X	X				X						X	X
13	No kickdown	X	X	X	X		X				X	X		
14	Engine flares up or slips when upshifting or downshifting	X	X	X	X	X	X				X	X		
15	Engine flares up or slips when accelerating vehicle	X	X		X	X	X				X	X		
16	Judder upon torque converter clutch (TCC) operation	X	X				X						X	X
17	Excessive shift shock from N to D or N to R position/range		X	X	X	X	X	X	X			X		
18	Excessive shift shock is felt when upshifting and downshifting	X	X	X	X	X	X	X	X		X	X		
19	Excessive shift shock on torque converter clutch (TCC)	X	X			X	X						X	X
20	Noise occurs at idle when vehicle is stopped in all positions/ranges													
21	Noise occurs at idle when vehicle is stopped in D range, or in R position													
22	No engine braking in 1GR position of M range	X			X		X				X	X		
23	Transaxle overheats						X			X				X
24	Engine stalls when shifted to D range, or in R position						X						X	X
25	Engine stalls when driving at slow speeds or stopping						X						X	X
26	Starter does not work													
27	Gear position indicator light does not illuminate in D or M range													
28	Gear position indicator light illuminate in P, R and N position													
29	Does not upshift in M range													
30	Does not downshift in M range													

am3uuw0000008

NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION[FN4A-EL]

id0503a1800600

1	Vehicle does not move in D range, or in R position
DESCRIPTION	• Vehicle does not move when the accelerator pedal is depressed.
POSSIBLE CAUSE	• If the vehicle does not move in D range or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in the PCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related wiring harnesses. 1. Clutch slippage, worn (D range-Forward clutch, R position-Reverse clutch, Low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Selector lever malfunction 3. Improper operation of parking mechanism 4. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	When the vehicle is stopped on a flat, level road and the engine is off, does the vehicle move when pushed? (in D range or N, R positions with the brake pedal released)	Yes	Go to the next step.
		No	Inspect for parking mechanism. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
2	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
3	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
4	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.2 VEHICLE MOVES IN N POSITION[FN4A-EL]

id0503a1800700

2	Vehicle moves in N position
DESCRIPTION	• Vehicle creeps in N position. • Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	• If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related wiring harnesses. 1. Clutch burnt (Forward clutch) • Control valve body malfunction 2. Selector lever position disparity (Although the selector indicator shows N position, the hydraulic circuit shows D range or R position) **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the vehicle creep when selector lever is moved slightly in N position?	Yes	Go to the next step.
		No	Adjust the selector lever. (See 05-18-5 SELECTOR CABLE ADJUSTMENT.)
2	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect the PCM.
3	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
4	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED[FN4A-EL]

id0503a1800800

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	• Vehicle rolls on a downward slope in P position. • Tires are locked when P is disengaged. Vehicle does not move in D range, and R position when the accelerator pedal is depressed, and the engine remains in a stalled condition.
POSSIBLE CAUSE	1. Parking mechanism malfunction (May have effect on noise or shock from transaxle) 2. Improper adjustment of selector lever 3. If vehicle moves in N position, perform No.2 "VEHICLE MOVES IN N POSITION"

NO.4 EXCESSIVE CREEP[FN4A-EL]

id0503a1800900

4	Excessive creep
DESCRIPTION	• Vehicle accelerates in D range, and R position when accelerator pedal is not depressed.
POSSIBLE CAUSE	1. Engine idle speed is high (transaxle system is not cause of problem) 2. Go to No.9 "FAST IDLE/RUNS ON" (See 01-03A-35 NO.9 FAST IDLE/RUNS ON[LF, L3].)

NO.5 NO CREEP AT ALL[FN4A-EL]

id0503a1801000

5	No creep at all
DESCRIPTION	• Vehicle does not move in D range and R position when idling on a flat paved road.
POSSIBLE CAUSE	• Either transaxle is stuck in 3GR or 4GR position, or there is clutch slippage due to a stuck 3–4 clutch. 1. Clutch burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Malfunction of electronic parts of output and input system 3. There is no engine torque • Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the vehicle creep in any range/position?	Yes	Go to the next step.
		No	Inspect or adjust the selector lever. (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)
2	Inspect the value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP1 • APP2 • TP1 Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
4	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
5	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2. Except for California emission regulation applicable model

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION[FN4A-EL]

id0503a1801100

6	Low maximum speed and poor acceleration
DESCRIPTION	• Vehicle acceleration is poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.
POSSIBLE CAUSE	• If the clutch is stuck or does not stay in 3GR or 4GR, the malfunction is in engine circuit. 1. Clutch slippage, burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Accelerator pedal position sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Malfunction of electronic parts of output and input system 4. Transaxle fixed in 4GR (Operation of fail-safe function) • Forward clutch slippage • Vehicle speed sensor malfunction • Shift solenoid A malfunction (stuck ON) • Poor connection of connector 5. Insufficient starting torque (Suspected when in-gear condition, shift control and engine circuit are normal) • Torque converter malfunction (Poor operation, stuck) 6. Engagement of TCC operation range (Operation of fail-safe function) • Transaxle fluid temperature sensor malfunction (Short or open circuit) 7. Transaxle fixed in M range • M range switch malfunction 8. TR switch adjustment incorrect **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.30 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS."
2	Go to No.12 "LACK/LOSS OF POWER-ACCELERATION/CRUISE". (See 01-03A-42 NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE[LF, L3].) Is the CIS system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the transaxle connector. Does the vehicle operate as follows? **D range: 3GR (fixed)** **R position: Reverse**	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
4	Drive the vehicle in D range. Does the vehicle start from stop in first gear?	Yes	Go to the next step.
		No	Inspect the value at the following. (See 01-40A-13 PCM INSPECTION[LF, L3].) PCM PIDs (using the M-MDS): • APP1 • APP2 • TP1 • VSS PCM terminal voltage: • 1AO*1, 1AG*1, 1M*2, 1Q*2 (input/TSS) • 1S (TR switch) Repair or replace any malfunctioning parts.
5	Stop the engine. Inspect the shift solenoid A, B or C. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Are they normal?	Yes	Go to the next step.
		No	Inspect for the shift solenoid mechanical stuck. — If the shift solenoids normal, inspect for open or short circuit between the PCM connector terminals 1A*1, 1E*1, 1AD*1, 1B*2, 1C*2, 1D*2 and the control valve body terminals A, C or G.
6	Perform the stall test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is stall speed normal?	Yes	Reverify symptoms of malfunction.
		No	Overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
7	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.7 NO SHIFTING[FN4A-EL]

id0503a1801200

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When the gear position is fixed in 3GR or 4GR due to the fail-safe operation, the malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 "LOW MAXIMUM SPEED AND POOR ACCELERATION". 1. Clutch slippage, burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Accelerator pedal position sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation in fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Disconnected shift solenoid connector • Poor ground of shift solenoid 4. Transaxle fixed in 4GR (Operation in fail-safe function) • Forward clutch slippage • Vehicle speed sensor malfunction • Shift solenoid A malfunction (stuck ON) • Poor connection of connector 5. Transaxle fixed in M range • M range switch malfunction

NO.8 DOES NOT SHIFT TO 4GR[FN4A-EL]

id0503a1808200

8	Does not shift to 4GR
DESCRIPTION	• Vehicle does not upshift from 3GR to 4GR even though vehicle speed is increased. • Vehicle does not shift to 4GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
POSSIBLE CAUSE	• Basically, TCC does not operate when the fail-safe is operating. Verify the DTCs first. If the TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the M range switch circuit or TR switch circuit. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC piston slippage, burnt • Line pressure low • TP sensor malfunction • Engine coolant temperature sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction 2. Transaxle fluid temperature sensor malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction 3. TR switch malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect 4. Shift solenoid A, shift solenoid B, shift solenoid D valve malfunction • Short or open circuit in wiring harness • Poor connection of connector • Solenoid valve stuck 5. M range switch malfunction 6. Control valve body malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No. 28 "GEAR POSITION INDICATOR LIGHT ILLUMINATE IN D RANGE."
2	Inspect the voltage at the following PCM terminal. (See 01-40A-13 PCM INSPECTION[LF, L3].) • Terminal 1U (TFT sensor) Is the voltage normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Inspect the shift solenoid A, B or D. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Are they normal?	Yes	Inspect for the shift solenoid mechanical stuck. — If the shift solenoids normal, inspect for open or short circuit between the PCM connector terminals 1A[*1], 1E[*1], 1AD[*1], 1B[*2], 1C[*2], 1D[*2] and the control valve body terminals A, C or B.
		No	Go to the next step.
4	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH[*1]) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Inspect the value at the following PCM PID using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • VSS Repair or replace any malfunctioning parts.
		No	Repair open ground circuit. Reconnect the PCM.

STEP	INSPECTION	ACTION
5	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)	

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.9 ABNORMAL SHIFTING[FN4A-EL]

id0503a1801400

9	Abnormal shifting
DESCRIPTION	• Shift incorrectly (incorrect shift pattern).
POSSIBLE CAUSE	• There is a malfunction in the signal circuit which controls shifting (accelerator pedal position sensor, TP sensor, input/turbine speed sensor, vehicle speed sensor), the control valve is stuck, the accumulator (forward or servo apply) is stuck, or the clutch circuit is stuck. 1. Clutch slipped, burnt • Line pressure low • Control valve body malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Body GND malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction or mis-adjustment • Accelerator pedal position sensor malfunction or mis-adjustment • Input/turbine speed sensor malfunction 3. TR switch malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect the PCM.
2	Inspect the value at the following. (See 01-40A-13 PCM INSPECTION[LF, L3].) PCM PIDs (using M-MDS): • APP1 • APP2 • TP1 PCM terminal voltage: • 1AO*1, 1AG*1, 1M*2, 1Q*2 (Input/TSS) Are they normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
3	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.10 FREQUENT SHIFTING[FN4A-EL]

id0503a1801500

10	Frequent shifting
DESCRIPTION	• Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.
POSSIBLE CAUSE	• The malfunctioning circuit is basically the same as No.9 "ABNORMAL SHIFTING". However, a malfunction of the input signal to the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, vehicle speed sensor (including the sensor GND, sensor wiring harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW[FN4A-EL]

id0503a1801600

11	Shift point is high or low
DESCRIPTION	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	• If the transaxle does not shift abnormally, there is a malfunction of the input signal to the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, or vehicle speed sensor (including sensor GND). • If the engine speed is high or low, regardless of normal shifting, inspect the tachometer. • Verify that the output signal of the accelerator pedal position sensor and TP sensor change linearly.

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION[FN4A-EL]

id0503a1801700

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	• TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	• Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. **Caution** **• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC burnt (1) Input sensor system malfunction • Transaxle fluid temperature sensor • Vehicle speed sensor • Input/turbine speed sensor • Sensor GND (2) Output solenoid valve system malfunction (Sticking) • Shift solenoid E malfunction • Shift solenoid A malfunction (3) Control valve body malfunction system (Poor operation, stuck) • TCC hydraulic pressure system 2. TP sensor malfunction (Not operating linear) 3. Accelerator pedal position sensor malfunction (Not operating linear) 4. Input/turbine speed sensor or vehicle speed sensor malfunction 5. Brake switch malfunction (Always ON) 6. ECT sensor malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATE IN D RANGE."
2	Inspect the value at the following. (See 01-40A-13 PCM INSPECTION[LF, L3].) PCM PIDs (using M-MDS): • APP1 • APP2 • TP1 • VSS PCM terminal voltage: • 1AO*1, 1AG*1, 1M*2, 1Q*2 (Input/TSS) Are they normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness.
4	Inspect the resistance between shift solenoid A and E circuit at the PCM connector and transaxle connector. Are the resistances **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the shift solenoid A or E circuit. Reconnect the PCM.
5	Inspect the shift solenoid A and E. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Are the shift solenoids operating properly?	Yes	Replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
6	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.13 NO KICKDOWN[FN4A-EL]

id0503a1801800

13	No kickdown
DESCRIPTION	• Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	• If transaxle does not downshift though shifting is normal, the malfunction is in the accelerator pedal position sensor or TP sensor circuit (including sensor GND, sensor wiring harness and connector).

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING[FN4A-EL]

id0503a1801900

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	• When the accelerator pedal is depressed for acceleration from standstill, engine speed increases but vehicle speed increases slowly. • When the accelerator pedal is depressed while driving, engine speed increases but the vehicle speed does not.
POSSIBLE CAUSE	• There is clutch slippage because the clutch is stuck or the line pressure is low. 1. Clutch stuck, slippage (forward clutch, 3–4 clutch, 2–4 brake band, one-way clutch) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction or mis-adjustment • Accelerator pedal position sensor malfunction or mis-adjustment • Input/turbine speed sensor malfunction 3. Poor operation of mechanical pressure • Selector lever position disparity • TR switch position disparity **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

05-03A

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Is shift point normal?	Yes	Go to the next step.
		No	Go to No.9 "ABNORMAL SHIFTING".
2	Inspect the value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP1 • APP2 • TP1 Are the PIDs values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness. Reconnect the PCM.
4	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
5	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE[FN4A-EL]

id0503a1802000

15	Engine flares up or slips when accelerating the vehicle
DESCRIPTION	• Engine flares up when the accelerator pedal is depressed for upshifting. • Engine flares up suddenly when the accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	• The malfunction is basically the same as for No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING". If conditions for No.14 worsen, the malfunction will develop to No.15.

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION[FN4A-EL]

id0503a1802100

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	• Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	• Poor TCC engagement due to either slippage because the TCC is stuck or the line pressure is low **Caution** **• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. Torque converter clutch piston slippage, burnt • Line pressure high • Shift solenoid A malfunction • Control valve body malfunction • Body GND malfunction • Pressure control solenoid malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TFT sensor malfunction • TP sensor malfunction or mis-adjustment • Accelerator pedal position sensor malfunction or mis-adjustment • Input/turbine speed sensor malfunction 3. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the following PCM terminal voltage. (See 01-40A-13 PCM INSPECTION[LF, L3].) • 1AO*1, 1AG*1, 1M*2, 1Q*2 (Input/TSS) Are they normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
2	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness.
3	Inspect the resistance between shift solenoid A circuit terminal 1A*1, 1B*2 at the PCM connector and terminal A at the transaxle connector. Are the resistance **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the shift solenoid A circuit.
4	Inspect the shift solenoid. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is the solenoid valve operating properly?	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)

STEP	INSPECTION		ACTION
5	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
6	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE[FN4A-EL]

id0503a1802200

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	• Strong shock felt when shifting from N to D or N to R position/range.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. 1. Clutch burnt (N→D: Forward clutch, N→R: Reverse clutch or low and reverse brake) • Line pressure low, high • TP sensor malfunction • Accelerator pedal position sensor malfunction or mis-adjustment • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Shift solenoid B malfunction • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Control valve body malfunction • Sensor GND malfunction • Body GND malfunction 2. Poor hydraulic operation (Malfunction in range change) • Forward accumulator malfunction • Servo apply accumulator malfunction 3. Idle speed high 4. Poor tightening torque of engine mount, exhaust mount 5. Poor operation of mechanical pressure • Selector lever position disparity **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the shift shock occur only when the engine is cold?	Yes	Go to the next step.
		No	Go to Step 3.
2	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Inspect the value at the following. (See 01-40A-13 PCM INSPECTION[LF, L3].) PCM PIDs (using M-MDS): • APP1 • APP2 • TP1 PCM terminal voltage: • 2AC*1, 1U*2 (TFT sensor) Repair or replace any malfunctioning parts.
		No	Repair the wiring harness. Reconnect the PCM.
3	Perform the stall test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is stall speed normal?	Yes	Go to the next step.
		No	Go to Step 5.
4	Inspect the voltage at the following PCM terminal. (See 01-40A-13 PCM INSPECTION[LF, L3].) • 1AH*1, 1S*2 (TR switch) Is the voltage normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
5	Inspect the value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP1 • APP2 • TP1 Are the PIDs values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
6	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness. Reconnect the PCM.
7	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
8	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING[FN4A-EL]

id0503a1804600

18	**Excessive shift shock is felt when upshifting and downshifting**
DESCRIPTION	• Excessive shift shock is felt when depressing the accelerator pedal at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. The shift shock has worsened if the accelerator pedal position sensor, TP sensor, input/turbine speed sensor, or vehicle speed sensor signal malfunctions. 1. Clutch slippage, burnt (Forward clutch, 2–4 brake band, 3–4 clutch) • Line pressure low, high • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Accelerator pedal position sensor mis-adjustment • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • Transaxle temperature sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction • Accelerator pedal position sensor mis-adjustment • Input/turbine speed sensor malfunction 3. Poor hydraulic operation (Malfunction in range change) • Forward accumulator malfunction • Servo apply accumulator malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

05-03A

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Perform the stall test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
2	Inspect the value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP1 • APP2 • TP1 Are the PIDs values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness. Reconnect the PCM.
4	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
5	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)[FN4A-EL]

id0503a1802400

19	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	• Strong shock is felt when the TCC is engaged.
POSSIBLE CAUSE	• The troubleshooting flow is the same as No.16 "JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION".

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES[FN4A-EL]

id0503a1802500

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	• Transaxle is noisy in all positions and ranges when the vehicle is idling.
POSSIBLE CAUSE	• The malfunction is in the oil pump which causes a high-pitched noise to be emitted from the transaxle at idle. **Note** • If a noise is emitted during shifting only, the malfunction is in the shift solenoid D, E or shift solenoid A, B, C. If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise. • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect engine condition. Is there any engine concern (i. e. rough idle)?	Yes	Go to appropriate symptom troubleshooting. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
2	Does the noise stop when the transaxle connector is disconnected?	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
3	Inspect the value at the following. (See 01-40A-13 PCM INSPECTION[LF, L3].) PCM PIDs (using M-MDS): • APP1 • APP2 • TP1 • VSS PCM terminal voltage: • 1AO*1, 1AG*1, 1M*2, 1Q*2 (Input/TSS) Are they normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
4	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH*1) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness. Reconnect the PCM.
5	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
6	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION[FN4A-EL]

id0503a1802600

21	Noise occurs at idle when vehicle is stopped in D range, or in R position
DESCRIPTION	• Transaxle is noisy in D range, or in R position when vehicle is idling.
POSSIBLE CAUSE	• Although the malfunction is basically the same as No.20 "NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES", other causes may include selector lever position disparity or TR switch position disparity. **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE[FN4A-EL]

id0503a1802700

22	No engine braking in 1GR position of M range
DESCRIPTION	• Engine speed drops to idle but the vehicle coasts when the accelerator pedal is released when in 1GR of M range at low vehicle speed.
POSSIBLE CAUSE	1. Clutch slippage, burnt (low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid C malfunction • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • TP sensor malfunction • Accelerator pedal position sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Input/turbine speed sensor malfunction 3. M range switch ON not judged by the PCM (short, or open circuit, poor operation) • M range switch signal malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Do the following symptoms occur concurrently? • Engine flares up or slips during acceleration. • Engine flares up or slips when shifting.	Yes	Go to symptom troubleshooting NO.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING" or No.15 "ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE".
		No	Repeat basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)
2	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.23 TRANSAXLE OVERHEATS[FN4A-EL]

id0503a1802800

23	Transaxle overheats
DESCRIPTION	• Burnt smell emitted from transaxle. • Smoke emitted from transaxle.
POSSIBLE CAUSE	• The malfunction is restricted to the hindrance of coolant at the oil cooler. In addition, overheating of the transaxle may be caused by a malfunction of the transaxle fluid temperature sensor. 1. Burnt (TCC) • Line pressure low • Control valve body malfunction 2. Oil cooler malfunction (Foreign material mixed in ATF) 3. Transaxle fluid temperature sensor malfunction 4. Excessive amount of ATF 5. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect for bending, damage, corrosion or kinks of the oil cooler pipes. Are oil cooler pipes normal?	Yes	Go to the next step.
		No	Replace any malfunctioning parts.
2	Perform the stall test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Inspect value at the following PCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP1 • APP2 • TP1 Are the PID values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
4	Disconnect the PCM connector. Is the resistance between the ground terminals (1AZ, 1BB, 1BD, 1BH, 2BH[*1]) at the PCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the wiring harness. Reconnect the PCM.
5	Inspect the pressure control solenoid circuit. (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) Is it normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-04).)
		No	Repair or replace any malfunctioning parts.
6	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION[FN4A-EL]

id0503a1802900

24	Engine stalls when shifted to D range, or in R position
DESCRIPTION	• Engine stalls when shifting from N or P position to D range or R position at idle.
POSSIBLE CAUSE	• The malfunction is on the engine control side (i.e. Electronic throttle control system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or the TCC circuit (engine always stalls).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01-03A-36 NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3].) Is the engine control system normal?	Yes	Repeat the basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)
		No	Repair or replace any malfunctioning parts according to the inspection results.
2	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING[FN4A-EL]

id0503a1805800

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	• Engine stalls when the brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	• The malfunction is in the engine control system (e.g. Fuel injection control, Electronic throttle control system). Otherwise, the malfunction is in the control valve body, shift solenoid E or TCC.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01-03A-36 NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3].) Is the engine control system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.
2	Go to symptom troubleshooting No.5 "ENGINE STALLS-AFTER START/AT IDLE". (See 01-03A-23 NO.5 ENGINE STALLS-AFTER START/AT IDLE[LF, L3].) Is the engine control system normal?	Yes	Repeat the basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)
		No	Repair or replace any malfunctioning parts according to the inspection results.
3	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

NO.26 STARTER DOES NOT WORK[FN4A-EL]

id0503a1803100

26	Starter does not work
DESCRIPTION	• Starter does not work even when in P or N position.
POSSIBLE CAUSE	• Selector lever mis-adjustment • TR switch mis-adjustment • Open or short circuit in the TR switch

NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE[FN4A-EL]

id0503a1808800

27	Gear position indicator light does not illuminate in D or M range
DESCRIPTION	• Gear position indicator light in instrument cluster does not illuminate in D or M range with the ignition switch at ON.
POSSIBLE CAUSE	• M range switch, TR switch, instrument cluster, or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle ON-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at ON, When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes	Go to the next step.
		No	Check value at the following. PCM terminal voltage: • 1AH*1, 1S*2 (TR switch) Repair or replace any defective parts.
2	Inspect the voltage at PCM terminal 1AN*1, 1O*2 (M range switch). (See 01-40A-13 PCM INSPECTION[LF, L3].) Is voltage normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
3	Inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.) Is instrument cluster normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
4	Disconnect the PCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — PCM terminal 1AM and body GND — PCM terminal 1AI and body GND — Instrument cluster terminal 1W and body GND — Instrument cluster terminal 1X and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to the next step.
		No	Go to the next step.
5	Disconnect the PCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — PCM terminal 1AM and instrument cluster terminal 1W — PCM terminal 1AI and instrument cluster terminal 1X • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM.		

*1 : California emission regulation applicable model.

*2 : Except for California emission regulation applicable model.

NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION[FN4A-EL]

id0503a1808900

28	Gear position indicator light illuminate in P, R and N position
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates in P, R and N position with the ignition switch at ON.
POSSIBLE CAUSE	• M range switch, TR switch, instrument cluster, or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle ON-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03A-6 BASIC INSPECTION[FN4A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at ON, When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes	Go to the next step.
		No	Check value at the following. PCM terminal voltage: • 1AH*1, 1S*2 (TR switch) Repair or replace any defective parts.
2	Inspect the voltage at PCM terminal 1AN*1, 1O*2 (M range switch). (See 01-40A-13 PCM INSPECTION[LF, L3].) Is voltage normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
3	Inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.) Is instrument cluster normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
4	Disconnect the PCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — PCM terminal 1AM and body GND — PCM terminal 1AI and body GND — Instrument cluster terminal 1W and body GND — Instrument cluster terminal 1X and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to the next step.
		No	Go to the next step.
5	Disconnect the PCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — PCM terminal 1AM and instrument cluster terminal 1W — PCM terminal 1AI and instrument cluster terminal 1X • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM.		

*1 : California emission regulation applicable model.

*2 : Except for California emission regulation applicable model.

NO.29 DOES NOT UPSHIFT IN M RANGE[FN4A-EL]

id0503a1803400

29	Does not upshift in M range
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates, but the vehicle does not upshift when the selector lever is pushed to "+" side.
POSSIBLE CAUSE	• Up switch or related wiring harness malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the voltage at the PCM terminal 1AJ*1, 1K*2. (See 01-40A-13 PCM INSPECTION[LF, L3].) Is the voltage normal?	Yes	Inspect the instrument cluster.
		No	Inspect the up switch. • If the up switch is normal, inspect for continuity between the up switch and PCM terminal 1AJ*1, 1K*2.
2	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

NO.30 DOES NOT DOWNSHIFT IN M RANGE[FN4A-EL]

id0503a1803500

30	Does not downshift in M range
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates, but the vehicle does not downshift when the selector lever is pushed to "–" side.
POSSIBLE CAUSE	• Down switch or related wiring harness malfunction

Diagnostic procedure

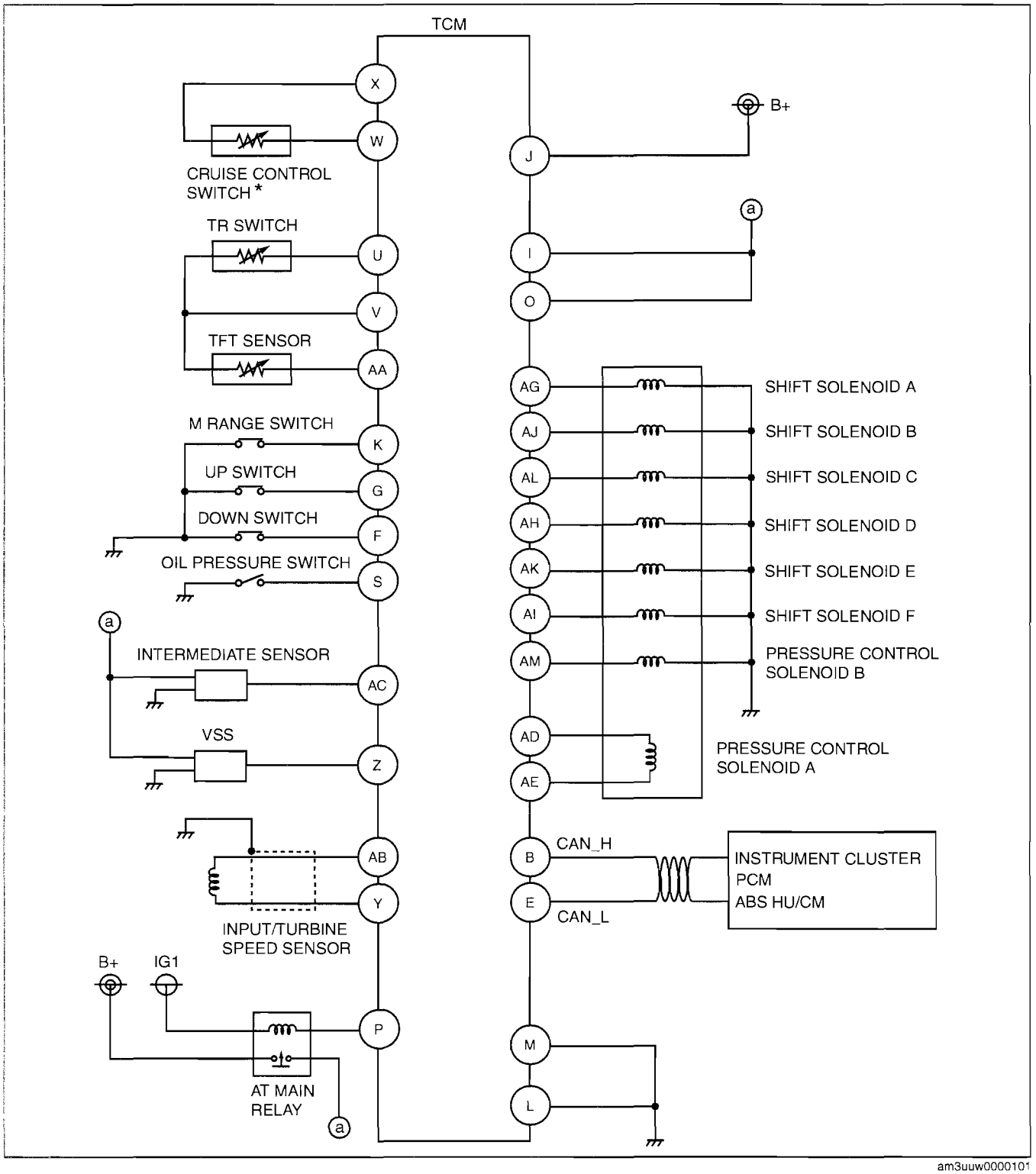
STEP	INSPECTION		ACTION
1	Inspect the voltage at the PCM terminal 1AF*1, 1P*2. (See 01-40A-13 PCM INSPECTION[LF, L3].) Is the voltage normal?	Yes	Inspect the instrument cluster.
		No	Inspect the down switch. • If the down switch is normal, inspect for continuity between the down switch and PCM terminal 1AF*1, 1P*2.
2	• Verify test results. — If normal, return to the diagnostic index to service any additional symptoms. — If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model

05-03B SYMPTOM TROUBLESHOOTING [FS5A-EL]

AUTOMATIC TRANSAXLE CONTROL SYSTEM WIRING DIAGRAM[FS5A-EL]

id050308800100



am3uuw0000101

* : Except for California emission regulation applicable model

FOREWORD[FS5A-EL]

id050308800200

- Refer to 00-00 section and thoroughly read and understand the basic flow of troubleshooting in order to properly perform the procedures.

BASIC INSPECTION[FS5A-EL]

id050308800300

STEP	INSPECTION		ACTION
1	Perform the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the mechanical system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
2	Turn the ignition switch to the ON position. When the selector lever is moved, does the gear position indicator light indication correspond to the selector lever position? Also, when other ranges are selected from N or P during idling, does the vehicle move **within 1—2 s**?	Yes	Go to the next step.
		No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-18-3 SELECTOR LEVER INSPECTION.) (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].) If the selector lever and TR switch are normal, go to the next step.
3	Inspect the ATF color and condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) Are the ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result. Flush the ATX and cooler line if necessary.
4	Perform the line pressure test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the line pressure normal?	Yes	Go to the next step.
		No	Adjust the accelerator cable if necessary. Repair or replace any malfunctioning parts according to the inspection result.
5	Perform the stall test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
6	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL • ECT • RPM • VPWR **TCM PIDs:** • TFT • TFTV • TR • TR_SENS • MNL SW • DWN SW • UP SW • THOP • TSS • OSS • VPWR TCM Are the PID values normal?	Yes	Perform the symptom troubleshooting and follow the procedures.
		No	Repair or replace any malfunctioning parts according to the inspection result.

SYMPTOM TROUBLESHOOTING ITEM TABLE[FS5A-EL]

id050308800400

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Vehicle does not move in D, M ranges, or in R position	Vehicle does not move when accelerator pedal is depressed.	(See 05-03B-9 NO.1 VEHICLE DOES NOT MOVE IN D, M RANGES, OR IN R POSITION[FS5A-EL].)
2	Vehicle moves in N position	Vehicle creeps in N position. Vehicle creeps if brake pedal is not depressed in N position.	(See 05-03B-10 NO.2 VEHICLE MOVES IN N POSITION[FS5A-EL].)
3	Vehicle moves in P position, or parking gear does not disengage when P position is disengaged	Vehicle rolls when on a downward slope and tires do not lock in P position. Tires locked when P position is disengaged, vehicle does not move in D, M ranges, and R position when accelerator pedal is depressed, and engine remains in stalled condition.	(See 05-03B-10 NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED[FS5A-EL].)
4	Excessive creep	Vehicle accelerates in D, M ranges and R position when accelerator pedal is not depressed.	(See 05-03B-10 NO.4 EXCESSIVE CREEP[FS5A-EL].)
5	No creep at all	Vehicle does not move in D, M ranges, or R position when idling on flat paved road.	(See 05-03B-11 NO.5 NO CREEP AT ALL[FS5A-EL].)
6	Low maximum speed and poor acceleration	Vehicle acceleration is poor at start. Delayed acceleration when accelerator pedal is depressed while driving.	(See 05-03B-12 NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION[FS5A-EL].)
7	No shifting	Single shift range only. Sometimes shifts correctly.	(See 05-03B-14 NO.7 NO SHIFTING[FS5A-EL].)
8	Does not shift to 5GR	Vehicle does not upshift from 4GR to 5GR even though vehicle speed is increased. Vehicle does not shift to 5GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.	(See 05-03B-15 NO.8 DOES NOT SHIFT TO 5GR[FS5A-EL].)
9	Abnormal shifting	Shifts incorrectly (incorrect shift pattern).	(See 05-03B-16 NO.9 ABNORMAL SHIFTING[FS5A-EL].)
10	Frequent shifting	Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.	(See 05-03B-17 NO.10 FREQUENT SHIFTING[FS5A-EL].)
11	Shift point is high or low	Shift point considerably different from automatic shift diagram. Shift delays when accelerating. Shift occurs suddenly when accelerating and engine speed does not increase.	(See 05-03B-17 NO.11 SHIFT POINT IS HIGH OR LOW[FS5A-EL].)
12	Torque converter clutch (TCC) non-operation	TCC does not operate when vehicle reaches TCC operation range.	(See 05-03B-18 NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION[FS5A-EL].)
13	No kickdown	Does not downshift when accelerator pedal is fully depressed within kickdown range.	(See 05-03B-19 NO.13 NO KICKDOWN[FS5A-EL].)
14	Engine flares up or slips when upshifting or downshifting	When accelerator pedal is depressed, engine speed increases normally but vehicle speed increases slowly. When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.	(See 05-03B-19 NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING[FS5A-EL].)
15	Engine flares up or slips when accelerating vehicle	Engine flares up when accelerator pedal is depressed for upshifting. Engine flares up suddenly when accelerator pedal is depressed for downshifting.	(See 05-03B-20 NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE[FS5A-EL].)
16	Judder upon torque converter clutch (TCC) operation	Vehicle jolts when TCC is engaged.	(See 05-03B-20 NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION[FS5A-EL].)

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
17	Excessive shift shock from N to D or N to R position/range	Strong shock is felt when shifting from N to D or N to R position/range at idle.	(See 05-03B-22 NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE[FS5A-EL].)
18	Excessive shift shock is felt when upshifting and downshifting	Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.	(See 05-03B-23 NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING[FS5A-EL].)
19	Excessive shift shock on torque converter clutch (TCC)	Strong shock is felt when TCC is engaged.	(See 05-03B-24 NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)[FS5A-EL].)
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	Transaxle is noisy in all positions and ranges when vehicle idling.	(See 05-03B-24 NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES[FS5A-EL].)
21	Noise occurs at idle when vehicle is stopped in D, M ranges, or in R position	Transaxle is noisy in driving ranges when vehicle is idling.	(See 05-03B-25 NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D, M RANGES, OR IN R POSITION[FS5A-EL].)
22	No engine braking in 1GR position of M range	Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in M range (1GR) at low vehicle speed.	(See 05-03B-26 NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE[FS5A-EL].)
23	Transaxle overheats	Burnt smell emitted from the transaxle. Smoke is emitted from the transaxle.	(See 05-03B-26 NO.23 TRANSAXLE OVERHEATS[FS5A-EL].)
24	Engine stalls when shifted to D, M ranges, or in R position	Engine stalls when shifting from N or P position to D, M ranges or R position at idle.	(See 05-03B-27 NO.24 ENGINE STALLS WHEN SHIFTED TO D, M RANGES, OR IN R POSITION[FS5A-EL].)
25	Engine stalls when driving at slow speeds or stopping	Engine stalls when brake pedal is depressed while driving at low speed or stopping.	(See 05-03B-28 NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING[FS5A-EL].)
26	Starter does not work	Starter does not work even when in P or N position.	(See 05-03B-28 NO.26 STARTER DOES NOT WORK[FS5A-EL].)
27	Gear position indicator light does not illuminate in D or M range	Gear position indicator light in instrument cluster does not illuminate in D or M range with ignition switch at ON.	(See 05-03B-29 NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE[FS5A-EL].)
28	Gear position indicator light illuminates in P, R and N position	Gear position indicator light in instrument cluster illuminates in P, R and N position with ignition switch at ON.	(See 05-03B-30 NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION[FS5A-EL].)
29	Does not upshift in M range	Gear position indicator light in instrument cluster illuminates but vehicle does not upshift when selector lever is pushed to "+" side.	(See 05-03B-31 NO.29 DOES NOT UPSHIFT IN M RANGE[FS5A-EL].)
30	Does not downshift in M range	Gear position indicator light in instrument cluster illuminates but vehicle does not downshift when selector lever is pushed to "–" side.	(See 05-03B-31 NO.30 DOES NOT DOWNSHIFT IN M RANGE[FS5A-EL].)

QUICK DIAGNOSIS CHART[FS5A-EL]

id050308800500

X : Applied

No.	Item	Selector lever mis-adjusted	Parking mechanism malfunction	Not within line pressure specification	Not within idle speed specification	Excessive amount of ATF	Electrical system components									
							ATX outer parts									
							TP sensor		APP sensor		Input/turbine speed sensor		VSS		ECT sensor	
	Symptom / Cause of trouble						No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input
1	Vehicle does not move in D, M ranges, or in R position	X		X		X										
2	Vehicle moves in N position	X														
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged	X														
4	Excessive creep		X		X	X										
5	No creep at all			X		X	X	X			X	X	X	X		
6	Low maximum speed and poor acceleration		X	X			X	X		X	X	X	X	X		
7	No shifting			X			X	X	X	X	X	X	X	X		
8	Does not shift to 5GR	X		X			X	X	X	X	X	X	X	X	X	X
9	Abnormal shifting	X		X		X	X	X	X	X	X	X	X	X		
10	Frequent shifting			X			X	X	X	X	X	X	X	X		
11	Shift point is high or low					X	X	X	X	X	X	X	X	X		
12	Torque converter clutch (TCC) non-operation					X	X	X	X	X	X	X	X	X	X	X
13	No kickdown						X	X	X	X						
14	Engine flares up or slips when upshifting or downshifting	X		X			X	X	X	X	X	X	X	X		
15	Engine flares up or slips when accelerating vehicle	X		X			X	X	X	X	X	X	X	X		
16	Judder upon torque converter clutch (TCC) operation			X			X	X	X	X	X	X	X	X		
17	Excessive shift shock from N to D or N to R position/range	X		X	X		X	X	X	X	X	X	X	X		
18	Excessive shift shock is felt when upshifting and downshifting			X			X	X	X	X	X	X	X	X		
19	Excessive shift shock on torque converter clutch (TCC)			X			X	X	X	X	X	X	X	X		
20	Noise occurs at idle when vehicle is stopped in all positions/ranges															
21	Noise occurs at idle when vehicle is stopped in D, M ranges, or in R position															
22	No engine braking in 1GR position of M range			X			X	X			X	X	X	X		
23	Transaxle overheats			X		X										
24	Engine stalls when shifted to D, M ranges, or in R position				X						X	X				
25	Engine stalls when driving at slow speeds or stopping				X											
26	Starter does not work															
27	Gear position indicator light does not illuminate in D or M range															
28	Gear position indicator light illuminates in P, R and N position															
29	Does not upshift in M range															
30	Does not downshift in M range															

am3uuw0000008

X : Applied

No.	Item	TR switch: Mis-adjusted	TR switch: Not operating properly	M range switch: No signal input	M range switch: Abnormal signal input	Up switch: No signal input	Up switch: Abnormal signal input	Down switch: No signal input	Down switch: Abnormal signal input	Brake switch: Always ON	Poor GND	TFT sensor: No signal input	TFT sensor: Malfunction signal input	Shift solenoid D malfunction
	Symptom / Cause of trouble	Electrical system components												
		ATX outer parts												
1	Vehicle does not move in D, M ranges, or in R position					X					X			X
2	Vehicle moves in N position													
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged													
4	Excessive creep													
5	No creep at all				X	X					X		X	X
6	Low maximum speed and poor acceleration	X	X	X	X	X					X	X	X	X
7	No shifting					X					X			X
8	Does not shift to 5GR	X	X	X	X						X	X	X	
9	Abnormal shifting	X	X			X					X			X
10	Frequent shifting										X			
11	Shift point is high or low										X			
12	Torque converter clutch (TCC) non-operation	X	X	X	X					X	X	X	X	
13	No kickdown					X					X			X
14	Engine flares up or slips when upshifting or downshifting	X	X			X					X			X
15	Engine flares up or slips when accelerating vehicle	X	X		X	X					X			X
16	Judder upon torque converter clutch (TCC) operation				X						X		X	
17	Excessive shift shock from N to D or N to R position/range				X	X					X		X	X
18	Excessive shift shock is felt when upshifting and downshifting			X	X	X					X			X
19	Excessive shift shock on torque converter clutch (TCC)										X		X	
20	Noise occurs at idle when vehicle is stopped in all positions/ranges				X									
21	Noise occurs at idle when vehicle is stopped in D, M ranges, or in R position													
22	No engine braking in 1GR position of M range					X					X			X
23	Transaxle overheats			X	X								X	
24	Engine stalls when shifted to D, M ranges, or in R position													
25	Engine stalls when driving at slow speeds or stopping													
26	Starter does not work	X	X											
27	Gear position indicator light does not illuminate in D or M range			X										
28	Gear position indicator light illuminates in P, R and N position				X									
29	Does not upshift in M range			X		X	X							
30	Does not downshift in M range			X				X	X					

am3uuw0000008

X : Applied

No.	Item	Shift solenoid E malfunction	Shift solenoid F malfunction	Shift solenoid A malfunction	Shift solenoid B malfunction	Shift solenoid C malfunction	Pressure control solenoid B malfunction	Pressure control solenoid A malfunction	Control valve is not operating properly	Forward accumulator is not operating properly	Servo apply accumulator is not operating properly	Pressure switch malfunction	Oil cooler is not operating properly	Slipping (Brake, clutch)	Burnt (Brake, clutch)	Torque converter is not operating properly	TCC burnt Inspection method
	Symptom / Cause of trouble	Electrical system components (ATX inner parts)							Hydraulic system components					Powertrain system			
1	Vehicle does not move in D, M ranges, or in R position			X	X		X	X	X					X	X	X	
2	Vehicle moves in N position								X						X		
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																
4	Excessive creep																
5	No creep at all			X	X	X		X	X					X	X	X	
6	Low maximum speed and poor acceleration		X	X	X	X		X	X					X	X	X	X
7	No shifting		X	X	X	X		X	X					X	X		
8	Does not shift to 5GR		X	X	X		X		X					X	X		
9	Abnormal shifting	X		X	X	X			X	X	X			X	X	X	
10	Frequent shifting													X	X		
11	Shift point is high or low													X			
12	Torque converter clutch (TCC) non-operation	X		X					X							X	X
13	No kickdown			X	X	X			X					X	X		
14	Engine flares up or slips when upshifting or downshifting	X	X	X	X	X		X	X					X	X		
15	Engine flares up or slips when accelerating vehicle	X	X	X		X		X	X					X	X		
16	Judder upon torque converter clutch (TCC) operation	X		X					X							X	X
17	Excessive shift shock from N to D or N to R position/range			X	X	X		X	X	X	X	X			X		
18	Excessive shift shock is felt when upshifting and downshifting	X		X	X	X	X	X	X	X	X	X		X	X		
19	Excessive shift shock on torque converter clutch (TCC)	X		X			X	X	X							X	X
20	Noise occurs at idle when vehicle is stopped in all positions/ranges																
21	Noise occurs at idle when vehicle is stopped in D, M ranges, or in R position																
22	No engine braking in 1GR position of M range	X				X	X		X					X	X		
23	Transaxle overheats								X				X				X
24	Engine stalls when shifted to D, M ranges, or in R position	X							X							X	X
25	Engine stalls when driving at slow speeds or stopping								X							X	X
26	Starter does not work																
27	Gear position indicator light does not illuminate in D or M range																
28	Gear position indicator light illuminates in P, R and N position																
29	Does not upshift in M range																
30	Does not downshift in M range																

am3uuw0000008

NO.1 VEHICLE DOES NOT MOVE IN D, M RANGES, OR IN R POSITION[FS5A-EL]

id050308808500

1	Vehicle does not move in D, M ranges, or in R position
DESCRIPTION	• Vehicle does not move when the accelerator pedal is depressed.
POSSIBLE CAUSE	• If the vehicle does not move in D, M ranges or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in the TCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related wiring harnesses. 1. Clutch slippage, worn (D, M ranges-Forward clutch, R position-Reverse clutch, Low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Pressure control solenoid A malfunction • Pressure control solenoid B malfunction • Body GND malfunction • Control valve body malfunction 2. Selector lever malfunction 3. Improper operation of parking mechanism 4. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

05-03B

Diagnostic procedure

STEP	INSPECTION		ACTION
1	When the vehicle is stopped on a flat, level road and the engine is off, does the vehicle move when pushed? (in D range or N, R positions with the brake pedal released)	Yes	Go to the next step.
		No	Inspect for parking mechanism. (See ATX workshop manual [FS5A-EL].)
2	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
3	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
4	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.2 VEHICLE MOVES IN N POSITION[FS5A-EL]

id050308800700

2	Vehicle moves in N position
DESCRIPTION	• Vehicle creeps in N position. • Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	• If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related wiring harnesses. 1. Clutch burnt (Forward clutch) • Control valve body malfunction 2. Selector lever position disparity (Although the selector indicator shows N position, the hydraulic circuit shows D range or R position) **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the vehicle creep when the selector lever is moved slightly in N position?	Yes	Go to the next step.
		No	Adjust the selector lever. (See 05-18-5 SELECTOR CABLE ADJUSTMENT.)
2	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect the TCM.
3	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
4	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED[FS5A-EL]

id050308800800

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	• Vehicle rolls on a downward slope in P position. • Tires are locked when P is disengaged. Vehicle does not move in D, M ranges, and R position when the accelerator pedal is depressed, and the engine remains in a stalled condition.
POSSIBLE CAUSE	1. Parking mechanism malfunction (May have effect on noise or shock from transaxle) 2. Improper adjustment of selector lever 3. If vehicle moves in N position, perform No.2 "VEHICLE MOVES IN N POSITION"

NO.4 EXCESSIVE CREEP[FS5A-EL]

id050308800900

4	Excessive creep
DESCRIPTION	• Vehicle accelerates in D, M ranges and R position when accelerator pedal is not depressed.
POSSIBLE CAUSE	1. Engine idle speed is high (transaxle system is not cause of problem) 2. Go to No.9 "FAST IDLE/RUNS ON" (See 01-03A-35 NO.9 FAST IDLE/RUNS ON[LF, L3].)

NO.5 NO CREEP AT ALL[FS5A-EL]

id050308801000

5	No creep at all
DESCRIPTION	• Vehicle does not move in D, M ranges and R position when idling on a flat paved road.
POSSIBLE CAUSE	• Either transaxle is stuck in 3GR or 4GR position, or there is clutch circuit slippage due to a stuck 3–4 clutch. 1. Clutch burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid A malfunction • Body GND malfunction • Control valve body malfunction 2. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Malfunction of electronic parts of output and input system 3. There is no engine torque • Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the vehicle creep in any range/position?	Yes	Go to the next step.
		No	Inspect or adjust the selector lever. (See 05-18-3 SELECTOR LEVER INSPECTION.) (See 05-18-5 SELECTOR CABLE ADJUSTMENT.)
2	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • THOP Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit.
4	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
5	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION[FS5A-EL]

id050308801100

6	Low maximum speed and poor acceleration
DESCRIPTION	• Vehicle acceleration is poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.
POSSIBLE CAUSE	• If the clutch is stuck or does not stay in 3GR, the malfunction is in the engine circuit. 1. Clutch slippage, burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Shift solenoid F malfunction • Pressure control solenoid A malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction • APP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Malfunction of electronic parts of output and input system 4. Transaxle fixed in 4GR (Operation of fail-safe function) • Forward clutch slippage • Vehicle speed sensor malfunction • Shift solenoid A malfunction (Stuck on) • Poor connection of connector 5. Insufficient starting torque (Suspected when in-gear condition, shift control and engine circuit are normal) • Torque converter malfunction (Poor operation, stuck) 6. Engagement of TCC operation range (Operation of fail-safe function) • Transaxle fluid temperature sensor malfunction (Short or open circuit) 7. Transaxle fixed in M range • M range switch malfunction 8. TR switch adjustment incorrect **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE" or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS"
2	Go to No.12 "LACK/LOSS OF POWER". (See 01-03A-42 NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE[LF, L3].) Is the CIS system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the solenoid connector. Does the vehicle operate as follows? **D range: 3GR (fixed)** **R position: Reverse**	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)

STEP	INSPECTION		ACTION
4	Drive the vehicle in D range. Does the vehicle start from stop in first gear?	Yes	Go to the next step.
		No	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • OSS • TSS • TR Repair or replace any malfunctioning parts.
5	Inspect the value at the following TCM PIDs using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • SSA/SS1 • SSB/SS2 • SSC/SS3 • SSF_SS6 Are the PID values normal?	Yes	Go to the next step.
		No	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • OSS • TSS Repair or replace any malfunctioning parts.
6	Perform the stall test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is stall speed normal?	Yes	Reverify symptoms of malfunction.
		No	Overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
7	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.7 NO SHIFTING[FS5A-EL]

id050308801200

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When the gear position is fixed in 3GR due to the fail-safe operation, the malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 “Low maximum speed and poor acceleration”. 1. Clutch slippage, burnt • Line pressure low • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Shift solenoid F malfunction • Pressure control solenoid A malfunction • Pressure control solenoid B malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • APP sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation of fail-safe function) • Short or open circuit in wiring harness • Poor connection of connector • Disconnected shift solenoid connector • Poor ground of shift solenoid 4. Transaxle fixed in 4GR (Operation of fail-safe function) • Forward clutch slippage • Vehicle speed sensor malfunction • Shift solenoid A malfunction (Stuck on) • Poor connection of connector 5. Transaxle fixed in M range • M range switch malfunction

NO.8 DOES NOT SHIFT TO 5GR[FS5A-EL]

id050308809300

8	Does not shift to 5GR
DESCRIPTION	• Vehicle does not upshift from 4GR to 5GR even though vehicle speed is increased. • Vehicle does not shift to 5GR even though accelerator pedal is released in D range at **60 km/h {37 mph}**.
POSSIBLE CAUSE	• Basically, TCC does not operate when the fail-safe is operating. Verify the DTCs first. If the TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the TR switch circuit. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC piston slippage, burned • Line pressure low • TP sensor malfunction • APP sensor malfunction • Engine coolant temperature sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Sensor GND malfunction 2. Transaxle fluid temperature sensor malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction 3. TR switch malfunction • Short or open circuit in wiring harness • Poor connection of connector • Sensor malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect 4. Shift solenoid A, shift solenoid B, shift solenoid D, Shift solenoid F valve malfunction • Short or open circuit in wiring harness • Poor connection of connector • Solenoid valve stuck 5. M range switch malfunction 6. Control valve body malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE" or No. 28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS"
2	Inspect the value at the following TCM PIDs using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • TFT • TFTV Are the PID values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Inspect the value at the following TCM PIDs using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • SSA/SS1 • SSB/SS2 • SSD/SS4 • SSF_SS6 Are the PID values normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Inspect the value at the following TCM PIDs using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • TR • TSS • OSS Repair or replace any malfunctioning parts.
		No	Repair open ground circuit. Reconnect the TCM.
5	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.9 ABNORMAL SHIFTING[FS5A-EL]

id050308801400

9	Abnormal shifting
DESCRIPTION	• Shifts incorrectly (incorrect shift pattern).
POSSIBLE CAUSE	• There is a malfunction in the signal circuit which controls shifting (TP sensor, input/turbine speed sensor, vehicle speed sensor), the control valve is stuck, the accumulator (forward or servo apply) is stuck, or the clutch circuit is stuck. 1. Clutch slippage, burnt • Line pressure low • Control valve body malfunction • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid F malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid B malfunction • Body GND malfunction • Accelerator cable mis-adjustment 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • APP sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. TR switch malfunction • Selector lever adjustment incorrect • TR switch adjustment incorrect **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect the TCM.
2	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • TSS • OSS • VSS Are the PID values normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
3	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

05-03B

NO.10 FREQUENT SHIFTING[FS5A-EL]

id050308801500

10	Frequent shifting
DESCRIPTION	• Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.
POSSIBLE CAUSE	• The malfunctioning circuit is basically the same as No.9 "ABNORMAL SHIFTING". However, a malfunction of the input signal to the TP sensor, APP sensor, input/turbine speed sensor, vehicle speed sensor (including the sensor GND, sensor wiring harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW[FS5A-EL]

id050308801600

11	Shift point is high or low
DESCRIPTION	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	• If the transaxle does not shift abnormally, there is a malfunction of the input signal to the TP sensor, APP sensor, input/turbine speed sensor, or vehicle speed sensor (including sensor GND). • If the engine speed is high or low, regardless of normal shifting, inspect the tachometer. • Verify that the output signal of the TP sensor and APP sensor changes linearly.

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION[FS5A-EL]

id050308801700

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	• TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	• Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. TCC burnt (1) Input sensor system malfunction • Transaxle fluid temperature sensor • Vehicle speed sensor • Input/turbine speed sensor • Sensor GND (2) Output solenoid valve system malfunction (Sticking) • Shift solenoid E malfunction • Shift solenoid A malfunction (3) Control valve body malfunction system (Poor operation, stuck) • TCC hydraulic pressure system 2. TP sensor malfunction (Not operating linear) 3. APP sensor malfunction (Not operating linear) 4. Input/turbine speed sensor or vehicle speed sensor malfunction 5. Brake switch malfunction (Always ON) 6. ECT sensor malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE" or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS"
2	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • OSS • TSS Are the PID values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit.
4	Inspect the resistance between shift solenoid A and E control circuit at the TCM connector and control valve body connector. Inspect resistance between shift solenoid A and E circuit at the TCM connector and control valve body connector. Are the resistances **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the shift solenoid A or E control. Reconnect the TCM.
5	Inspect the shift solenoid A and E. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) Are the shift solenoids operating properly?	Yes	Replace the TCM.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)

STEP	INSPECTION	ACTION
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.	

NO.13 NO KICKDOWN[FS5A-EL]

id050308801800

13	No kickdown
DESCRIPTION	• Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	• If transaxle does not downshift though shifting is normal, the malfunction is in the TP sensor and APP sensor circuit (including sensor GND, sensor wiring harness and connector).

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING[FS5A-EL]

id050308801900

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	• When the accelerator pedal is depressed for driveaway, engine speed increases but vehicle speed increases slowly. • When the accelerator pedal is depressed while driving, engine speed increases but the vehicle does not.
POSSIBLE CAUSE	• There is clutch slippage because the clutch is stuck or the line pressure is low. 1. Clutch stuck, slippage (forward clutch, 3–4 clutch, 2–4 brake band, one-way clutch) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid F malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid A malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • APP sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Poor operation of mechanical pressure • Selector lever position disparity • TR switch position disparity **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Is shift point normal?	Yes	Go to the next step.
		No	Go to No.9 "ABNORMAL SHIFTING".
2	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • THOP Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit. Reconnect the TCM.
4	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
5	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE[FS5A-EL]

id050308802000

15	Engine flares up or slips when accelerating the vehicle
DESCRIPTION	• Engine flares up when the accelerator pedal is depressed for upshifting. • Engine flares up suddenly when the accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	• The malfunction is basically the same as for No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING". If conditions for No.14 worsen, the malfunction will develop to No.15.

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION[FS5A-EL]

id050308802100

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	• Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	• Poor TCC engagement due to either slippage because the TCC is stuck or the line pressure is low **Caution** • **If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.** 1. Torque converter clutch piston slippage, burnt • Line pressure high • Shift solenoid A malfunction • Shift solenoid E malfunction • Control valve body malfunction • Body GND malfunction • Pressure control solenoid A malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TFT sensor malfunction • APP sensor malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • TSS Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
2	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit.
3	Inspect the resistance between shift solenoid A and E control circuit at the TCM connector and control valve body connector. Inspect the resistance between shift solenoid A/E circuit at the TCM connector and control valve body connector. Are the resistances **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the shift solenoid A and/or E circuit.
4	Inspect the shift solenoid. (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) Is the solenoid valve operating properly?	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
5	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Replace the TCM.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE[FS5A-EL]

id050308802200

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	• Strong shock felt when shifting from N to D or N to R position/range.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. 1. Clutch burnt (N→D: Forward clutch, N→R: Reverse clutch or low and reverse brake) • Line pressure low, high • APP sensor malfunction • TP sensor malfunction • Vehicle speed sensor malfunction • Input/turbine speed sensor malfunction • Shift solenoid B malfunction • Shift solenoid D malfunction • Shift solenoid A malfunction • Shift solenoid C malfunction • Pressure control solenoid A malfunction • Control valve body malfunction • Sensor GND malfunction • Body GND malfunction 2. Poor hydraulic operation (Malfunction in range change) • Forward accumulator malfunction • Servo apply accumulator malfunction • Pressure switch malfunction 3. Idle speed high 4. Poor tightening torque of engine mount, exhaust mount 5. Poor operation of mechanical pressure • Selector lever position disparity **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Does the shift shock occur only when the engine is cold?	Yes	Go to the next step.
		No	Go to Step 3.
2	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • TFT • TFTV Repair or replace any malfunctioning parts.
		No	Repair the open ground circuit. Reconnect the TCM.
3	Perform the stall test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Go to Step 5.
4	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • TR Is the PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
5	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • THOP Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.

STEP	INSPECTION		ACTION
6	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit. Reconnect the TCM.
7	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
8	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING[FS5A-EL]

id050308804600

18	Excessive shift shock is felt when upshifting and downshifting
DESCRIPTION	• Excessive shift shock is felt when depressing the accelerator pedal at upshifting. During cruising, excessive shift shock is felt when depressing the accelerator pedal at downshifting.
POSSIBLE CAUSE	• Shift shock may worsen when the fail-safe is operating. The shift shock has worsened if the TP sensor, input/turbine speed sensor, or vehicle speed sensor signal malfunctions. 1. Clutch slippage, burnt (Forward clutch, 2–4 brake band, 3–4 clutch) • Line pressure low, high • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid B malfunction • Pressure control solenoid A malfunction • Accelerator cable mis-adjustment • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • Transaxle temperature sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction • APP sensor malfunction • Input/turbine speed sensor malfunction 3. Poor hydraulic operation (Malfunction in range change) • Pressure switch malfunction • Forward accumulator malfunction • Servo apply accumulator malfunction 4. Engine mounts installation • Loose attaching bolts • Worn parts **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the engine mounts for loose tightening bolts or worn parts. Are all engine mounts normal?	Yes	Go to the next step.
		No	Readjust, retighten or replace engine mounts.
2	Perform the stall test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Inspect the value at the following PCM PID using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP • TP REL Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
4	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit. Reconnect the TCM.
5	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)[FS5A-EL]

id050308802400

19	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	• Strong shock is felt when the TCC is engaged.
POSSIBLE CAUSE	• The troubleshooting flow is the same as No.16 "JUDDER UPON TCC OPERATION".

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES[FS5A-EL]

id050308802500

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	• Transaxle is noisy in all positions and ranges when the vehicle is idling.
POSSIBLE CAUSE	• The malfunction is in the oil pump which causes a high-pitched noise to be emitted from the transaxle at idle. **Note** • If a noise is emitted during shifting only, the malfunction is in shift solenoid D, E or shift solenoid A, B, C. If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise. • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect engine condition. Is there any engine concern (i. e. rough idle)?	Yes	Go to appropriate symptom troubleshooting. (See 01-03A-11 ENGINE SYMPTOM TROUBLESHOOTING[LF, L3].)
		No	Go to the next step.
2	Does the noise stop when the solenoid connector is disconnected?	Yes	Go to the next step.
		No	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
3	Inspect the value at the following PCM and TCM PIDs using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 05-17B-36 TCM INSPECTION[FS5A-EL].) **PCM PIDs:** • APP • TP REL **TCM PIDs:** • THOP • OSS • TSS Are the PID values normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
4	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit. Reconnect the TCM.
5	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D, M RANGES, OR IN R POSITION[FS5A-EL]

id050308808600

21	Noise occurs at idle when vehicle is stopped in D, M ranges, or in R position
DESCRIPTION	• Transaxle is noisy in D, M ranges, or in R position when vehicle is idling.
POSSIBLE CAUSE	• Although the malfunction is basically the same as No.20 "NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES", other causes may include selector lever position disparity or TR switch position disparity.

NO.22 NO ENGINE BRAKING IN 1GR POSITION OF M RANGE[FS5A-EL]

id050308802700

22	No engine braking in 1GR position of M range
DESCRIPTION	• Engine speed drops to idle but the vehicle coasts when the accelerator pedal is released when in 1GR of M range at low vehicle speed.
POSSIBLE CAUSE	1. Clutch slippage, burnt (low and reverse brake) • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid C malfunction • Pressure control solenoid B malfunction • Control valve body malfunction • Body GND malfunction 2. Signal malfunction • TP sensor malfunction • APP sensor malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • Input/turbine speed sensor malfunction 3. TCM does not determine that the M range switch is ON (short, or open circuit, poor operation) • M range switch signal malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Do the following symptoms occur concurrently? • Engine flares up or slips during acceleration. • Engine flares up or slips when shifting.	Yes	Go to symptom troubleshooting NO.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING" or No.15 "ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE".
		No	Repeat basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03B-3 BASIC INSPECTION[FS5A-EL].)
2	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.23 TRANSAXLE OVERHEATS[FS5A-EL]

id050308802800

23	Transaxle overheats
DESCRIPTION	• Burnt smell emitted from transaxle. • Smoke emitted from transaxle.
POSSIBLE CAUSE	• The malfunction is restricted to the hindrance of coolant at the oil cooler. In addition, overheating of the transaxle may be caused by a malfunction of the transaxle fluid temperature sensor. 1. Burnt (TCC) • Line pressure low • Control valve body malfunction • Accelerator cable mis-adjustment 2. Oil cooler malfunction (Foreign material mixed in ATF) 3. Transaxle fluid temperature sensor malfunction 4. Excessive amount of ATF 5. Torque converter malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect for bending, damage, corrosion or kinks of the oil cooler pipes. Are oil cooler pipes normal?	Yes	Go to the next step.
		No	Replace any malfunctioning parts.
2	Perform the stall test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
3	Inspect the value at the following PCM PID using the M-MDS. (See 01-40A-13 PCM INSPECTION[LF, L3].) • APP • TP REL Is the PID value normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts.
4	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground **less than 5.0 ohms**?	Yes	Go to the next step.
		No	Repair the open ground circuit. Reconnect the TCM.
5	Inspect the value at the following TCM PID using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.24 ENGINE STALLS WHEN SHIFTED TO D, M RANGES, OR IN R POSITION[FS5A-EL]

id050308808700

24	Engine stalls when shifted to D, M ranges, or in R position
DESCRIPTION	• Engine stalls when shifting from N or P position to D, M ranges or R position at idle.
POSSIBLE CAUSE	• The malfunction is on the engine control side (i.e. electronic throttle control system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or the TCC circuit (engine always stalls).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01-03A-36 NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3].) Is the engine control system normal?	Yes	Repeat the basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03B-3 BASIC INSPECTION[FS5A-EL].)
		No	Repair or replace any malfunctioning parts according to the inspection results.
2	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING[FS5A-EL]

id050308805800

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	• Engine stalls when the brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	• Malfunction is in engine control system (e.g. Fuel injection control, electronic throttle control system). Otherwise, the malfunction is in the control valve body, shift solenoid E or TCC.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See 01-03A-36 NO.10 LOW IDLE/STALLS DURING DECELERATION[LF, L3].) (See 01-40A-13 PCM INSPECTION[LF, L3].) Is the engine control system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.
2	Go to symptom troubleshooting No.5 "ENGINE STALLS-AFTER START/AT IDLE" (See 01-03A-23 NO.5 ENGINE STALLS-AFTER START/AT IDLE[LF, L3].) (See 01-40A-13 PCM INSPECTION[LF, L3].) Is the engine control system normal?	Yes	Repeat the basic inspection and repair or replace any malfunctioning parts according to the inspection result. (See 05-03B-3 BASIC INSPECTION[FS5A-EL].)
		No	Repair or replace any malfunctioning parts according to the inspection results.
3	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.26 STARTER DOES NOT WORK[FS5A-EL]

id050308803100

26	Starter does not work
DESCRIPTION	• Starter does not work even when in P or N position.
POSSIBLE CAUSE	• Selector lever mis-adjustment • TR switch mis-adjustment • Open or short circuit in the TR switch terminal

NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE[FS5A-EL]

id050308808800

27	Gear position indicator light does not illuminate in D or M range
DESCRIPTION	• Gear position indicator light in instrument cluster does not illuminate in D or M range with the ignition switch at ON.
POSSIBLE CAUSE	• M range switch, TR switch, instrument cluster, or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle ON-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03B-3 BASIC INSPECTION[FS5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at ON, When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes	Go to the next step.
		No	Check value at the following. TCM terminal voltage: • 1U (TR switch) Repair or replace any defective parts.
2	Inspect the voltage at TCM terminal 1K (M range switch). (See 05-17B-36 TCM INSPECTION[FS5A-EL].) Is voltage normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
3	Inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.) Is instrument cluster normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
4	Disconnect the TCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — TCM terminal 1B and body GND — TCM terminal 1E and body GND — Instrument cluster terminal 1I and body GND — Instrument cluster terminal 1K and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to the next step.
		No	Go to the next step.
5	Disconnect the TCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — TCM terminal 1B and instrument cluster terminal 1I — TCM terminal 1E and instrument cluster terminal 1K • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION[FS5A-EL]

id050308808900

28	Gear position indicator light illuminate in P, R and N position
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates in P, R and N position with the ignition switch at ON.
POSSIBLE CAUSE	• M range switch, TR switch, instrument cluster, or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle ON-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See 05-03B-3 BASIC INSPECTION[FS5A-EL].)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	With the ignition switch at ON, When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes	Go to the next step.
		No	Check value at the following. TCM terminal voltage: • 1U (TR switch) Repair or replace any defective parts.
2	Inspect the voltage at TCM terminal 1K (M range switch). (See 05-17B-36 TCM INSPECTION[FS5A-EL].) Is voltage normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
3	Inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.) Is instrument cluster normal?	Yes	Go to the next step.
		No	Repair or replace any defective part.
4	Disconnect the TCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — TCM terminal 1B and body GND — TCM terminal 1E and body GND — Instrument cluster terminal 1I and body GND — Instrument cluster terminal 1K and body GND • Is there continuity?	Yes	Repair or replace harness for short to GND, then go to the next step.
		No	Go to the next step.
5	Disconnect the TCM and instrument cluster connector. • Turn the ignition switch off. • Check continuity between the following circuits: — TCM terminal 1B and instrument cluster terminal 1I — TCM terminal 1E and instrument cluster terminal 1K • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.29 DOES NOT UPSHIFT IN M RANGE[FS5A-EL]

id050308803400

29	Does not upshift in M range
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates, but the vehicle does not upshift when the selector lever is pushed to "+" side.
POSSIBLE CAUSE	• Up switch or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the UP SW PID value using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) Is the UP SW PID value normal?	Yes	Inspect the instrument cluster.
		No	Inspect the up switch. If the up switch is normal, inspect for continuity between the up switch and TCM terminal G.
2	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

NO.30 DOES NOT DOWNSHIFT IN M RANGE[FS5A-EL]

id050308803500

30	Does not downshift in M range
DESCRIPTION	• Gear position indicator light in instrument cluster illuminates, but the vehicle does not downshift when the selector lever is pushed to "–" side.
POSSIBLE CAUSE	• Down switch or related wiring harness malfunction **Note** • Before following the troubleshooting steps, make sure that the Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

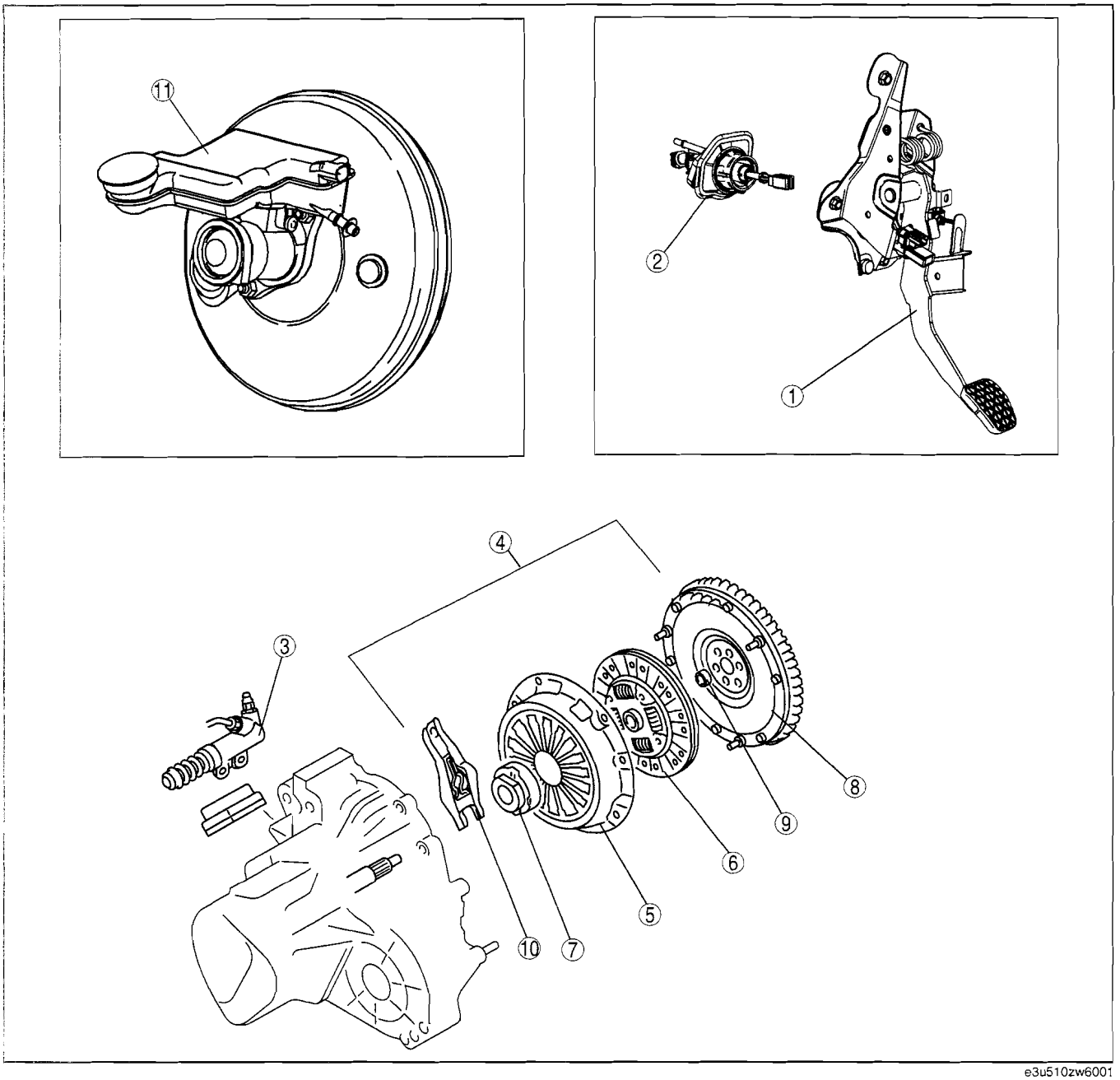
Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the DWN SW PID value using the M-MDS. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) Is the DWN SW PID value normal?	Yes	Inspect the instrument cluster.
		No	Inspect the down switch. If the down switch is normal, inspect for continuity between the down switch and TCM terminal F.
2	• Verify the test results. — If normal, return to the diagnostic index to service any additional symptoms. — If the malfunction remains, inspect the related Service information and perform repair or diagnosis. • If the vehicle is repaired, troubleshooting is completed. • If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.		

05-10 CLUTCH

CLUTCH LOCATION INDEX

id051000800400



e3u510zw6001

1	Clutch pedal (See 05-10-4 CLUTCH PEDAL INSPECTION.) (See 05-10-4 CLUTCH PEDAL REMOVAL/ INSTALLATION.)
2	Clutch master cylinder (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
3	Clutch release cylinder (See 05-10-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.)
4	Clutch unit (See 05-10-11 CLUTCH UNIT REMOVAL/ INSTALLATION.)
5	Clutch cover (See 05-10-14 CLUTCH COVER INSPECTION.)
6	Clutch disc (See 05-10-15 CLUTCH DISC INSPECTION.)

7	Clutch release collar (See 05-10-15 CLUTCH RELEASE COLLAR INSPECTION.)
8	Flywheel [LF, L3] or dual-mass flywheel [L3 WITH TC] (See 05-10-16 FLYWHEEL INSPECTION[LF, L3].) (See 05-10-16 DUAL-MASS FLYWHEEL INSPECTION[L3 WITH TC].)
9	Pilot bearing (See 05-10-16 PILOT BEARING INSPECTION.)
10	Clutch release fork (See 05-10-11 CLUTCH UNIT REMOVAL/ INSTALLATION.)
11	Reserve tank (See 05-10-3 CLUTCH FLUID INSPECTION.) (See 05-10-3 CLUTCH FLUID AIR BLEEDING/ REPLACEMENT.)

GENERAL PROCEDURES (CLUTCH)

id051000800500

Note
- A common reservoir is used for the clutch and brake system fluid.

Caution
- **If clutch pipes have been disconnected any time during the procedure, add clutch fluid (brake fluid), bleed the air, and inspect for leakage after the procedure has been completed.**

CLUTCH FLUID INSPECTION

id051000800600

Note
- A common reservoir is used for the clutch and brake system fluid.
- The fluid in the reservoir must be maintained between the MIN/MAX level during replacement.

CLUTCH FLUID AIR BLEEDING/REPLACEMENT

id051000800700

Caution
- **Fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

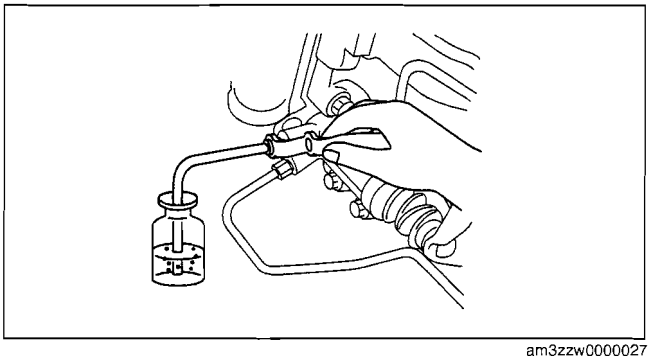
Note
- Do not mix different brands of clutch fluid.
- Do not reuse the clutch fluid that was drained out.

Clutch fluid
SAE J1703, FMVSS 116 DOT-3

1. Remove the under cover. (L3 WITH TC)
2. Draw the fluid from the reservoir tank with a suction pump.
3. Remove the bleeder cap from the bleeder plug and attach a vinyl hose to the bleeder plug.
4. Place the other end of the vinyl hose into a container.
5. Slowly pump the clutch pedal several times.
6. With the clutch pedal depressed, loosen the bleeder screw to let fluid escape.
7. Tighten the bleeder screw to stop the fluid.
8. Repeat Steps 5, 6 and 7 until only clean fluid without air is seen.
9. Tighten the bleeder screw.

Tightening torque
5.0—10.0 N·m
{51—101 kgf·cm, 45—88 in·lbf}

10. Add fluid to the MAX mark.
11. Verify the correct clutch operation.



am3zzw0000027

CLUTCH PEDAL INSPECTION

id051000801100

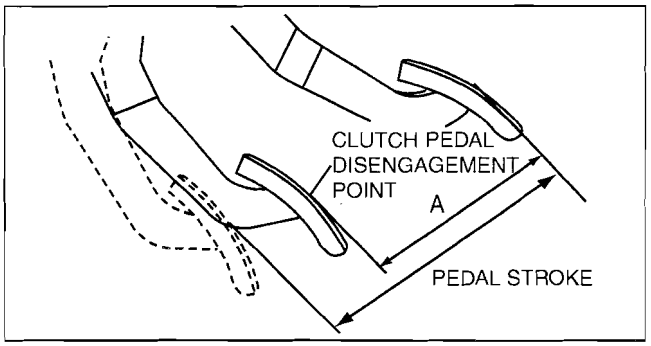
Clutch Pedal Disengagement Point Inspection

Warning
- **When performing the following procedure, make sure that the area around the vehicle is free of people or objects as the vehicle might move suddenly.**

1. Apply the parking brake and fix the front and rear of the wheels with the wheel chocks.
2. Start the engine at idle.
3. Without depressing the clutch pedal, move the shift lever slowly to the reverse position.
4. Hold the lever when the gear noise is heard.
5. Depress the clutch pedal slowly.
6. Hold the pedal when the gear noise stops (clutch pedal disengagement point).
7. Measure distance A, verify that they are within specification.

Clutch pedal disengagement stroke
90—110 mm {3.55—4.33 in} (Reference value)

Clutch pedal stroke
135 mm {5.31 in} (Reference value)



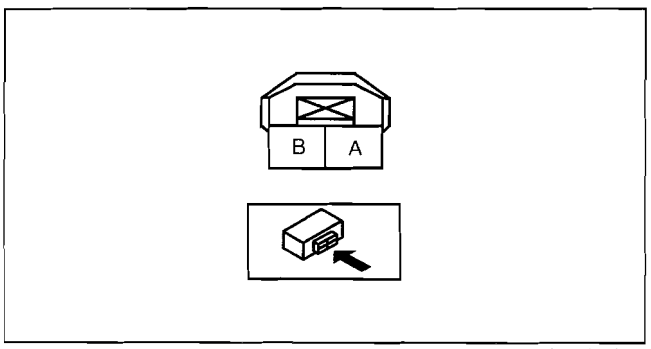
am3uuw0000069

Clutch Pedal Position Switch Inspection

1. Disconnect the negative battery cable.
2. Disconnect the clutch pedal position switch connector.
3. Verify continuity as indicated in the table.

O—O : Continuity

Condition	Connector terminal	
	A	B
Clutch pedal is depressed	O	O
Clutch pedal is not depressed		



am3uuw0000069

am3uuw0000069

- If there is any malfunction, replace the clutch switch. (See 05-10-4 CLUTCH PEDAL REMOVAL/INSTALLATION.)

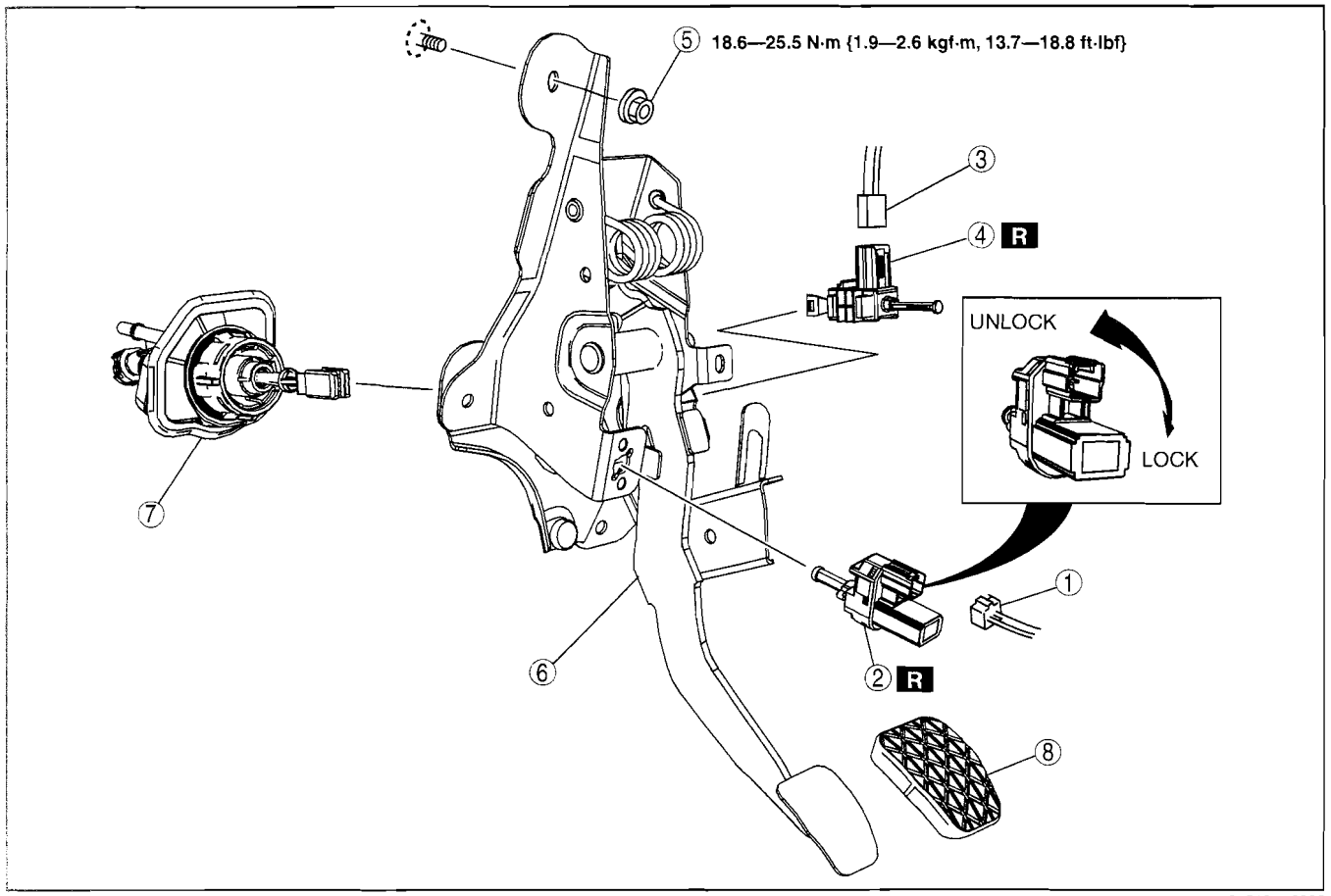
CLUTCH PEDAL REMOVAL/INSTALLATION

id051000801200

Caution
- **Fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

1. Remove the battery and battery tray.
   (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Separate the steering shaft.
3. Separate the clutch pipe and reserve hose.
   (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Bleed the air from the system. (See 05-10-3 CLUTCH FLUID AIR BLEEDING/REPLACEMENT.)

7. After installation, inspect the clutch pedal. (See 05-10-4 CLUTCH PEDAL INSPECTION.)



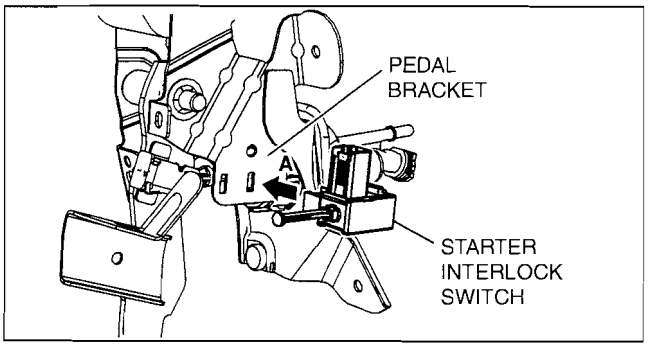
e3u510zw6002

1	Clutch pedal position switch connector
2	Clutch pedal position switch (See 05-10-6 Clutch Pedal Position Switch Installation Note.)
3	Starter interlock switch connector
4	Starter interlock switch (See 05-10-5 Starter Interlock Switch Installation Note.)

5	Nuts
6	Clutch pedal component
7	Clutch master cylinder (See 05-10-6 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION.)
8	Pedal pad

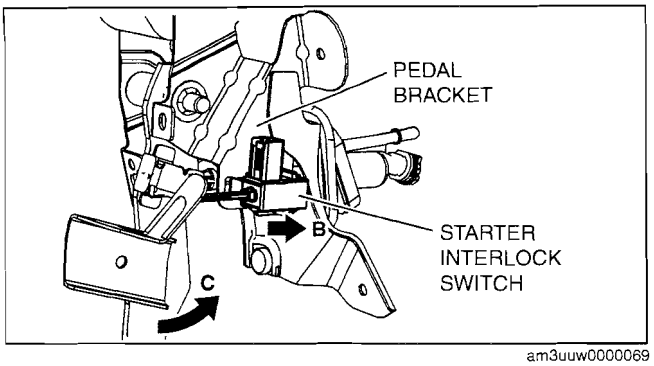
Starter Interlock Switch Installation Note

1. Insert the new starter interlock switch into the pedal bracket hole in the direction indicated by arrow A.



am3uuw0000069

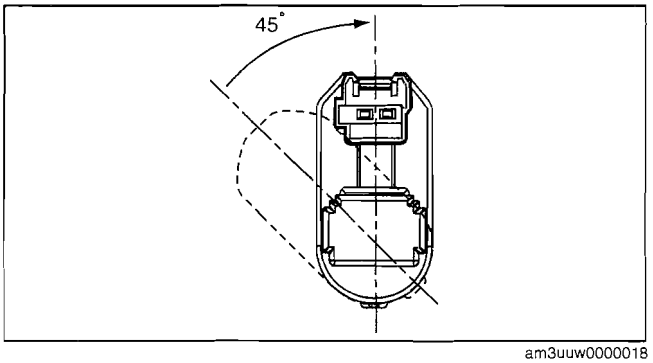
2. Slide the starter interlock switch pressing it in the direction indicated by arrow B until it is locked.
3. Press the clutch pedal fully in the direction indicated by arrow C and adjust the starter interlock switch terminal.



am3uuw0000069

Clutch Pedal Position Switch Installation Note

1. Insert the new clutch pedal position switch into the pedal bracket hole until the switch stops.
2. Rotate the clutch pedal position switch **45°** clockwise.
3. Verify that the clutch pedal position switch is locked securely.



am3uuw0000018

CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

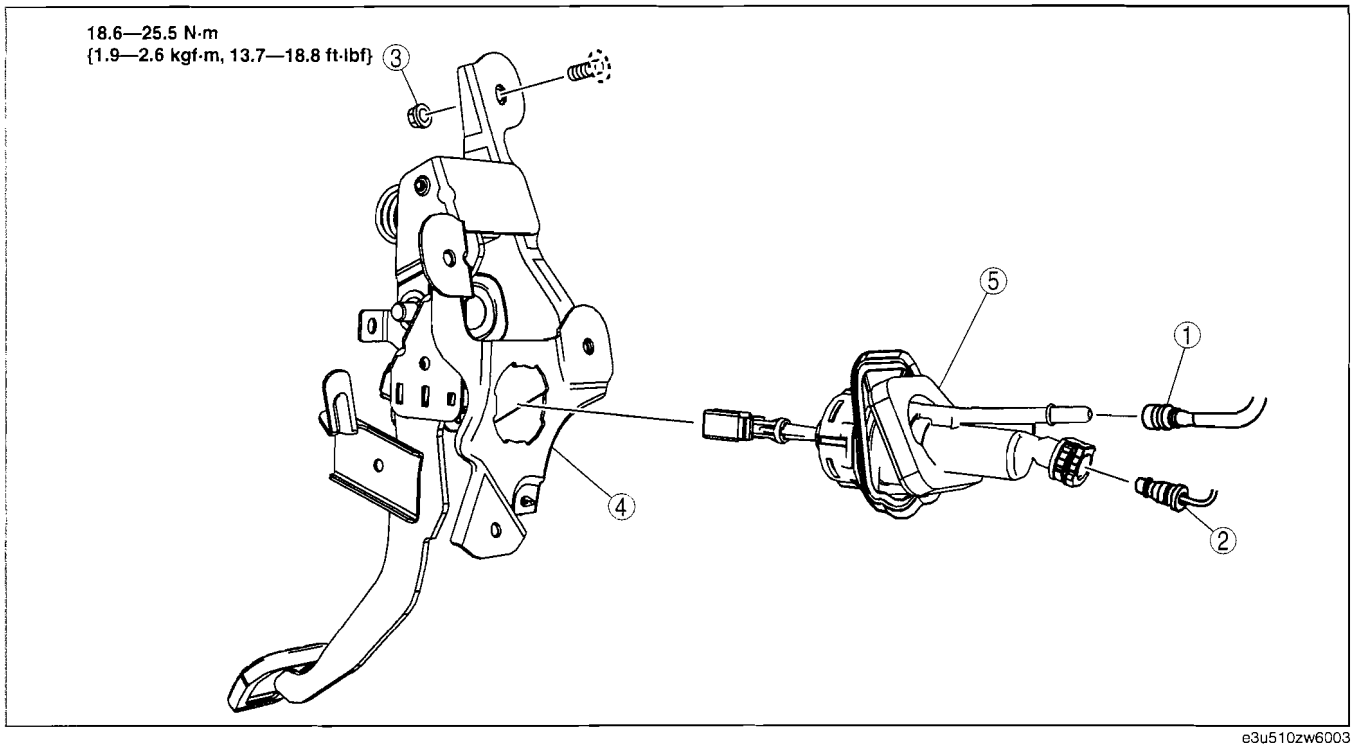
id051000801400

Caution

- **Fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

1. Remove the battery and battery tray.
   (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
2. Separate the steering shaft.
3. Remove in the order indicated in the table.
4. Plug the clutch pipe after removing it to avoid leakage.
5. Install in the reverse order of removal.
6. Bleed the air from the system. (See 05-10-3 CLUTCH FLUID AIR BLEEDING/REPLACEMENT.)

7. After installation, inspect the clutch pedal. (See 05-10-4 CLUTCH PEDAL INSPECTION.)

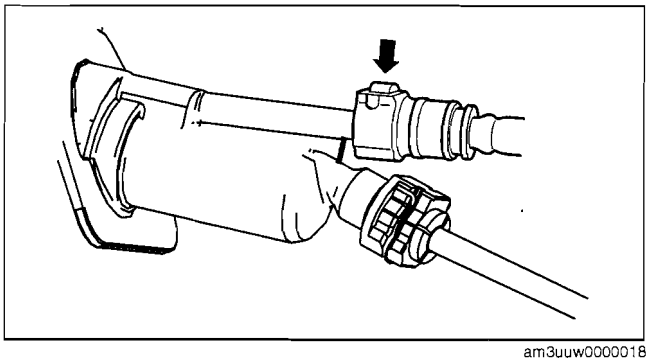


e3u510zw6003

1	Reserve hose (See 05-10-7 Clutch Pipe And Clutch Reserve Hose Removal Note.) (See 05-10-9 Clutch Pipe And Clutch Reserve Hose Installation Note.)
2	Clutch pipe (See 05-10-7 Clutch Pipe And Clutch Reserve Hose Removal Note.) (See 05-10-9 Clutch Pipe And Clutch Reserve Hose Installation Note.)
3	Nuts
4	Clutch pedal component (See 05-10-4 CLUTCH PEDAL REMOVAL/ INSTALLATION.)
5	Clutch master cylinder (See 05-10-8 Clutch Master Cylinder Removal Note.) (See 05-10-8 Clutch Master Cylinder Installation Note.)

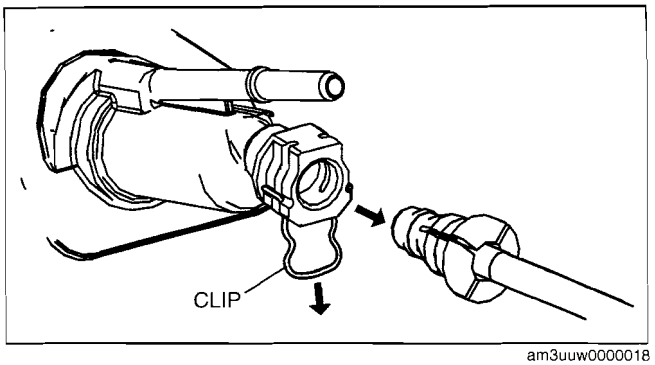
Clutch Pipe And Clutch Reserve Hose Removal Note

1. Remove the reserve hose from the master cylinder while pressing the point indicated by the arrow in the figure.



am3uuw0000018

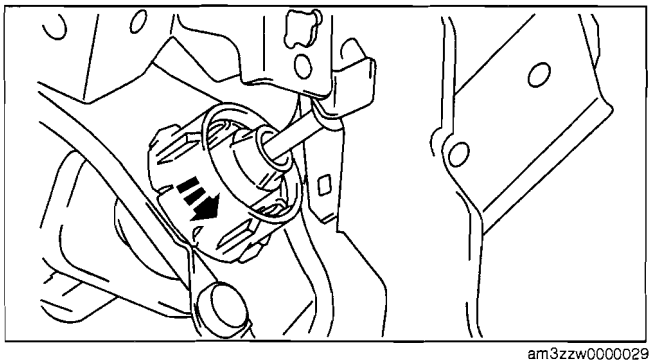
2. Pull the clutch master cylinder clip to the position shown in the figure and pull out the clutch pipe connector straight to detach it.



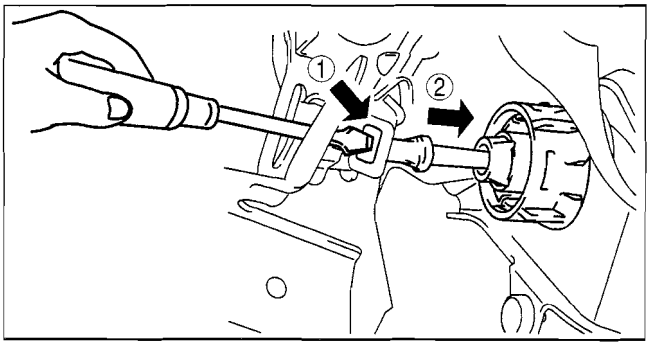
am3uuw0000018

Clutch Master Cylinder Removal Note

1. Rotate the clutch master cylinder in the direction shown and remove.


am3zzw0000029

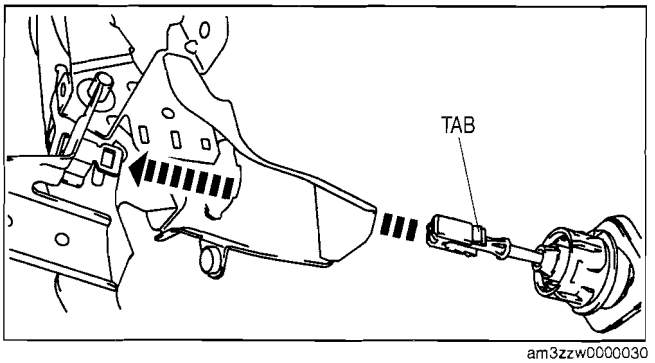
2. Press on the tabs on the left and right sides of the push rod using a flathead screwdriver and remove the rod.



am3zzw0000030

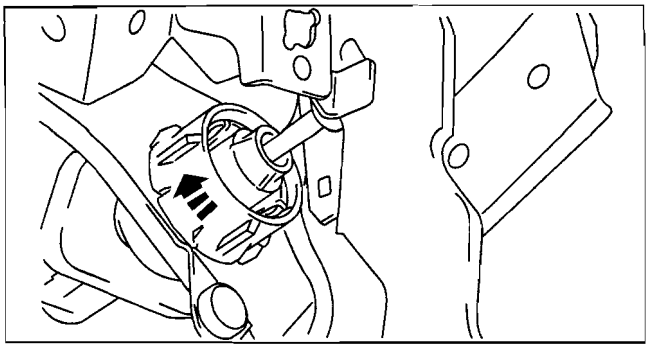
Clutch Master Cylinder Installation Note

1. Push the push rod in until the tabs lock.



am3zzw0000030

2. Rotate the clutch master cylinder in the direction shown until it stops.



am3zzw0000030

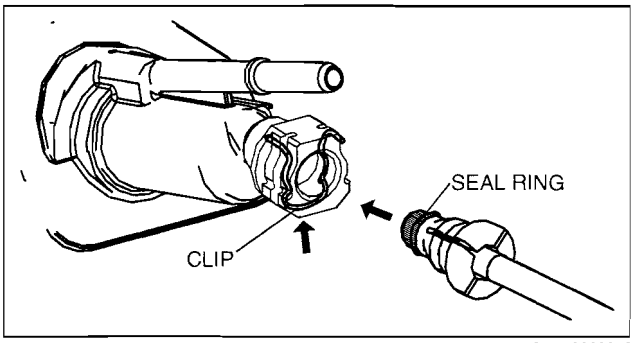
Clutch Pipe And Clutch Reserve Hose Installation Note

1. Return the clutch master cylinder clip to the position shown in the figure.

Caution

- **Verify that there is no chipping or damage to the seal ring of the clutch pipe connector.**

2. Insert the clutch pipe connector straight.
3. Pull the clutch pipe to verify that it does not come off, and reinsert it completely.
4. Insert the reserve hose connector straight until a click is heard.
5. Pull the reserve hose to verify that it does not come off, and reinsert it completely.



am3uuw0000019

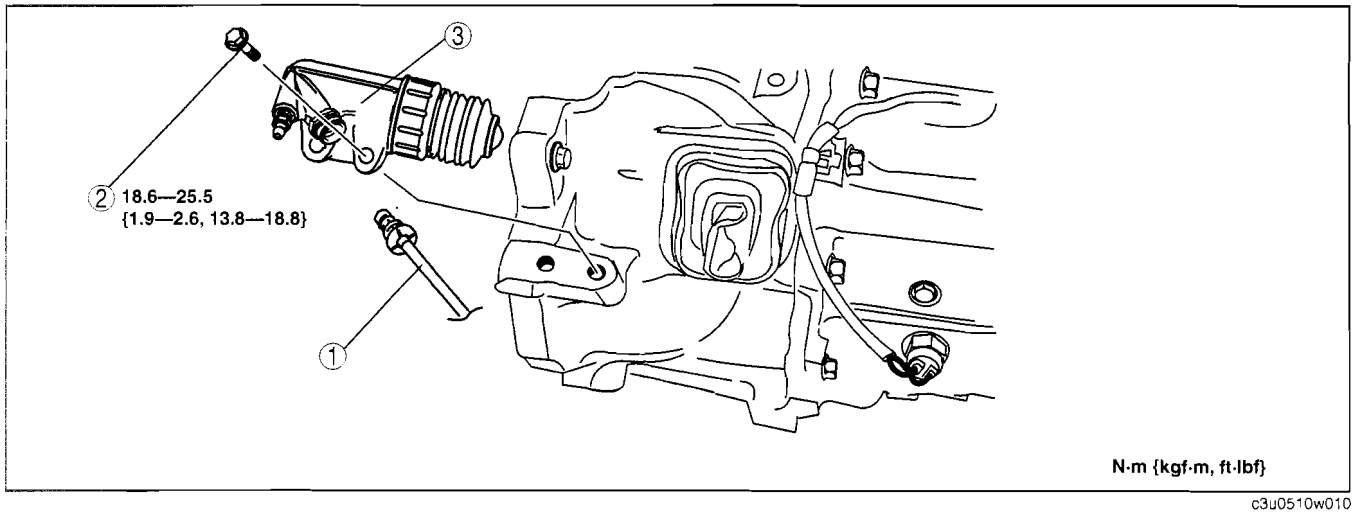
CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

id051000801300

Caution

- **Fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.**

1. Remove the under cover.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Bleed the air from the system. (See 05-10-3 CLUTCH FLUID AIR BLEEDING/REPLACEMENT.)
5. After installation, inspect the clutch pedal. (See 05-10-4 CLUTCH PEDAL INSPECTION.)



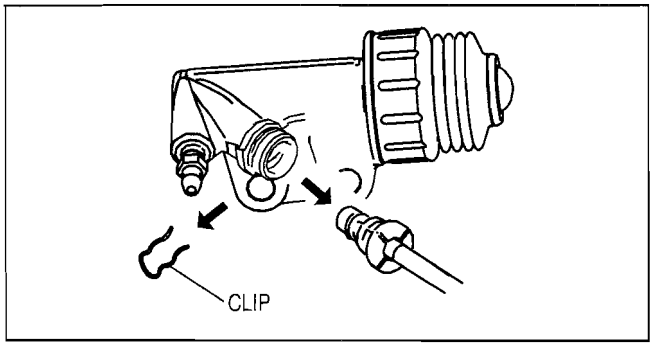
c3u0510w010

1	Clutch pipe (See 05-10-10 Clutch Pipe Removal Note.) (See 05-10-10 Clutch Pipe Installation Note.)

2	Bolt
3	Clutch release cylinder

Clutch Pipe Removal Note

1. Pull out the clip and, then pull out the clutch pipe connector straight to detach it.



am3uuw0000069

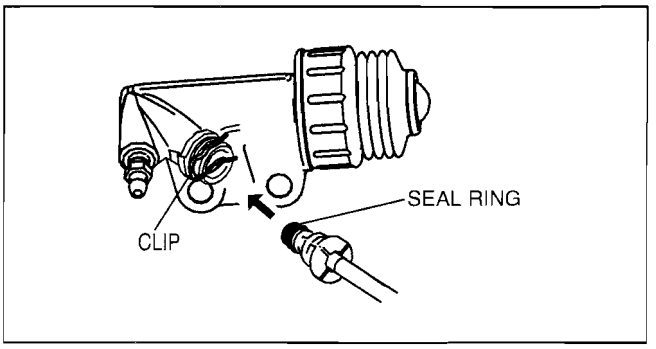
Clutch Pipe Installation Note

1. Return the clip to the position shown in the figure.

Caution

- **Verify that there is no chipping or damage to the seal ring of the clutch pipe connector.**

2. Insert the clutch pipe connector straight.
3. Pull the clutch pipe to verify that it does not come off, and reinsert it completely.

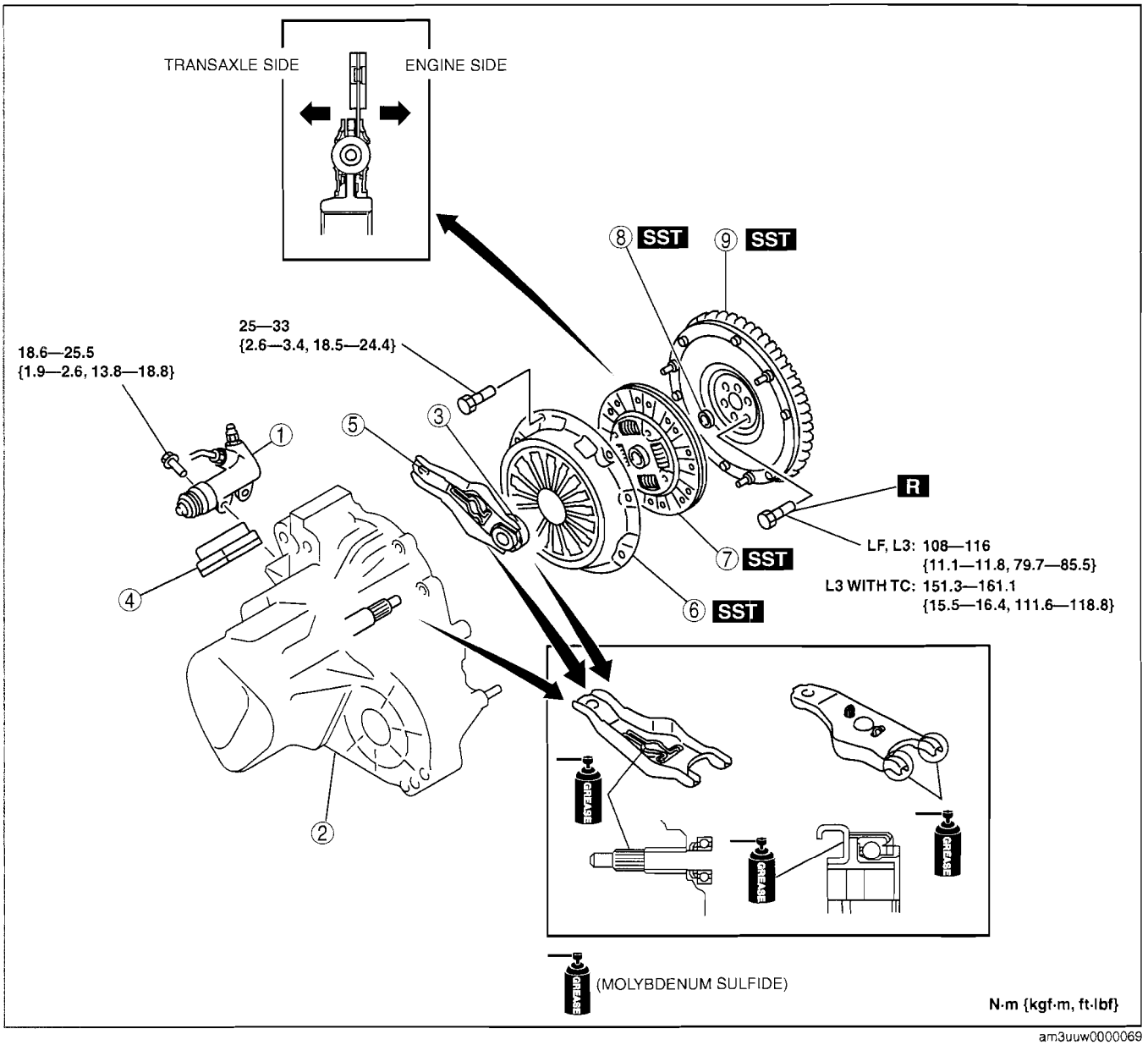


am3uuw0000069

CLUTCH UNIT REMOVAL/INSTALLATION

id051000800300

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



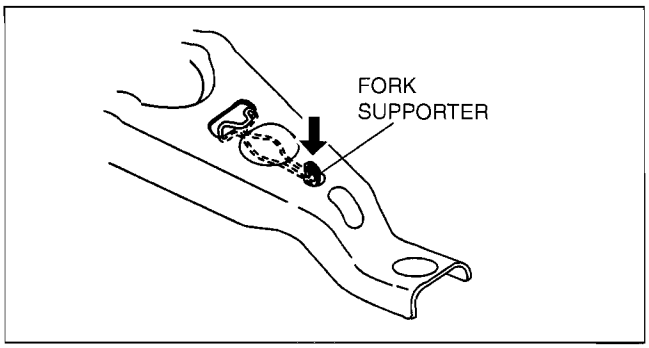
am3uuw0000069

1	Clutch release cylinder (See 05-10-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.)
2	Manual transaxle (See 05-15A-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R].) (See 05-15B-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[A26M-R].)
3	Clutch release collar (See 05-10-15 CLUTCH RELEASE COLLAR INSPECTION.)
4	Boot
5	Clutch release fork (See 05-10-12 Clutch Release Fork Removal Note.)

6	Clutch cover (See 05-10-12 Clutch Cover and Disc Removal Note.) (See 05-10-14 Clutch Cover Installation Note.)
7	Clutch disc (See 05-10-12 Clutch Cover and Disc Removal Note.) (See 05-10-14 Clutch Disc Installation Note.)
8	Pilot bearing (See 05-10-12 Pilot Bearing Removal Note.) (See 05-10-13 Pilot Bearing Installation Note.)
9	Flywheel [LF, L3] or dual-mass flywheel [L3 WITH TC] (See 05-10-13 Flywheel or Dual-mass Flywheel Removal Note.) (See 05-10-13 Flywheel or Dual-mass Flywheel Installation Note.)

Clutch Release Fork Removal Note

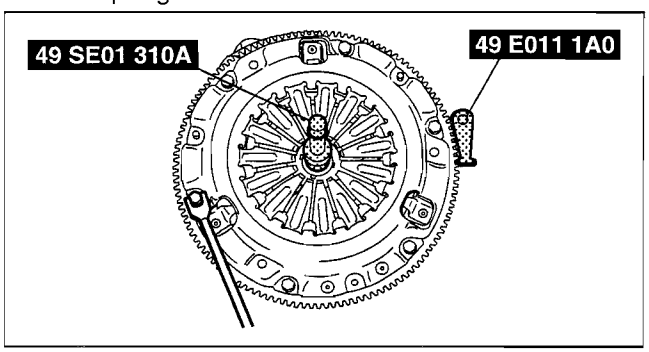
1. Remove the fork supporter before disassembling the release fork.



am3uuw0000019

Clutch Cover and Disc Removal Note

1. Install the **SSTs**.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.



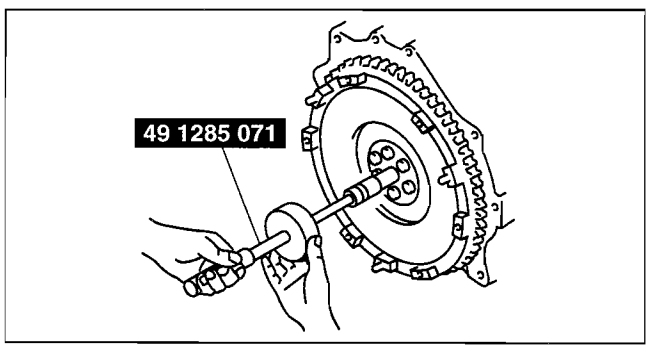
am3uuw0000019

Pilot Bearing Removal Note

Note

- The pilot bearing does not need to be removed unless you are replacing it.

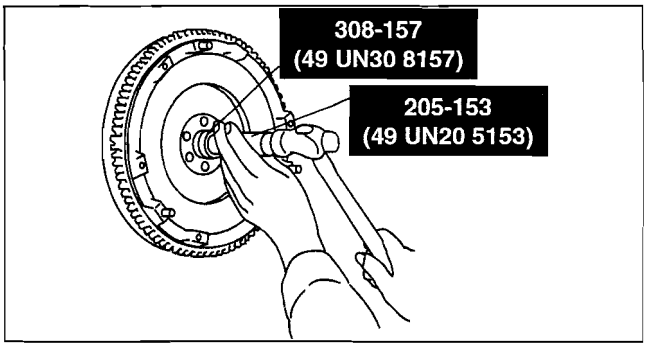
1. Use the **SST** to remove the pilot bearing.



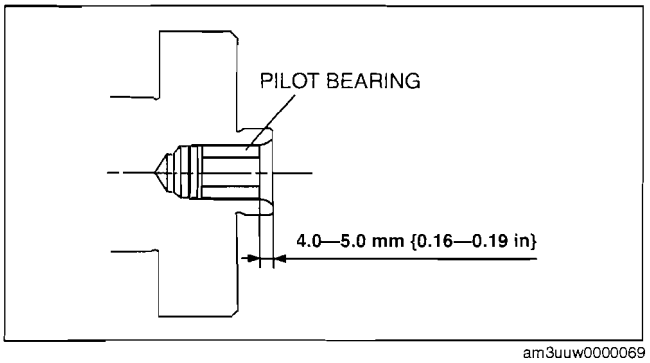
am3uuw0000020

Pilot Bearing Installation Note

1. Use the **SSTs** to install the pilot bearing.



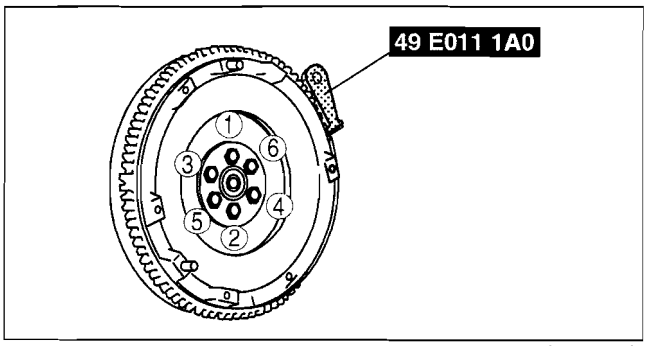
am3uuw0000020



am3uuw0000069

Flywheel or Dual-mass Flywheel Removal Note

1. Hold the flywheel or dual-mass flywheel using the **SST**.
2. Remove the bolts evenly and gradually in a crisscross pattern.
3. Remove the flywheel or dual-mass flywheel.
4. Inspect for oil leakage from the crankshaft rear oil seal.
   - If there is any malfunction, replace the crankshaft rear oil seal.
     (See 01-10A-27 REAR OIL SEAL REPLACEMENT[LF, L3].)
     (See 01-10B-27 REAR OIL SEAL REPLACEMENT[L3 WITH TC].)

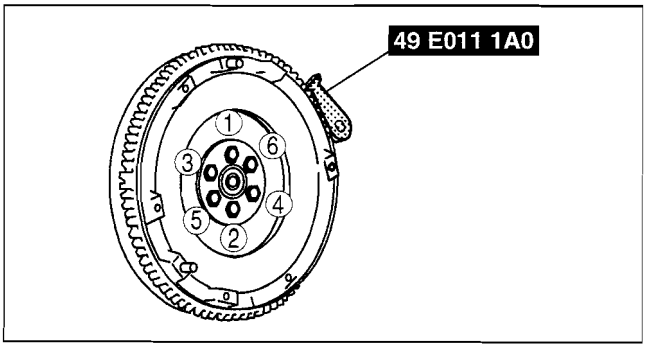


am3uuw0000020

Flywheel or Dual-mass Flywheel Installation Note

1. Install the flywheel or dual-mass flywheel to the crankshaft.
2. Clean the crankshaft thread holes before installing the new lock bolts.
3. Hand-tighten the flywheel lock bolts or dual-mass flywheel lock bolts.
4. Install the **SST** to the flywheel or dual-mass flywheel.
5. Gradually tighten the flywheel lock bolts or dual-mass flywheel lock bolts in a crisscross pattern.

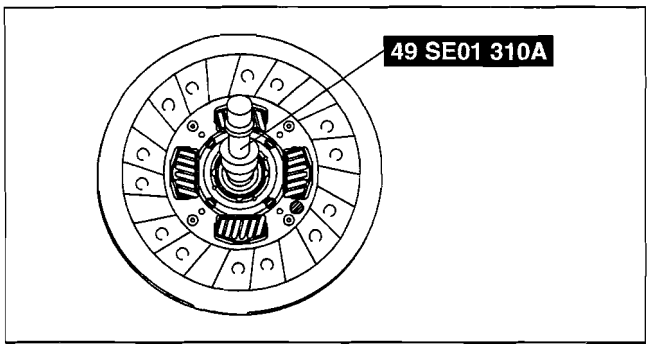
Tightening torque
LF, L3: 108—116 N·m
{11.1—11.8 kgf·m, 79.7—85.5 ft·lbf}
L3 WITH TC: 151.3—161.1 N·m
{15.5—16.4 kgf·m, 111.6—118.8 ft·lbf}



am3uuw0000020

Clutch Disc Installation Note

1. Hold the clutch disc position using the **SST**.

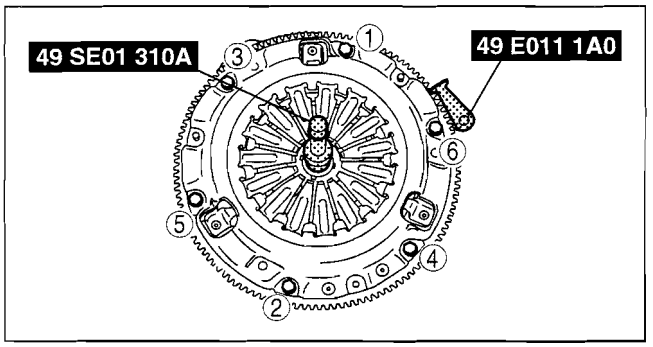


am3uuw0000020

Clutch Cover Installation Note

1. Install the **SSTs**.
2. Tighten the bolts evenly and gradually in a crisscross pattern.

Tightening torque
25—33 N·m
{2.6—3.4 kgf·m, 18.5—24.4 ft·lbf}



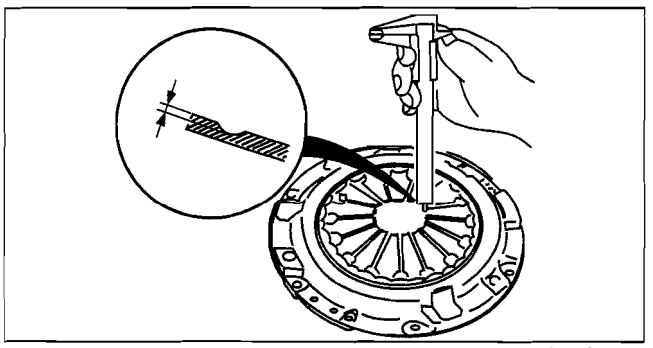
am3uuw0000020

CLUTCH COVER INSPECTION

id051000800800

1. Measure the wear of the diaphragm spring fingers.
   - If it exceeds the maximum specification, replace the clutch cover.

Clutch cover diaphragm spring fingers maximum depth
0.6 mm {0.024 in}

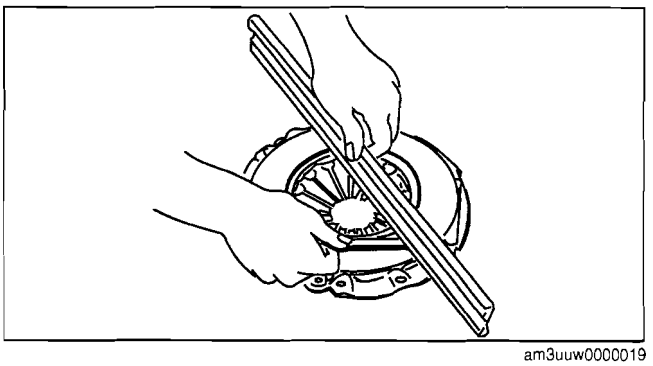


am3uuw0000019

2. Measure the flatness of the pressure plate with a straight edge and a feeler gauge.
   - If it exceeds the maximum specification, replace the clutch cover.

Maximum clearance of flatness of the pressure plate
LF, L3: 0.5 mm {0.020 in}
L3 WITH TC: 0.3 mm {0.012 in}

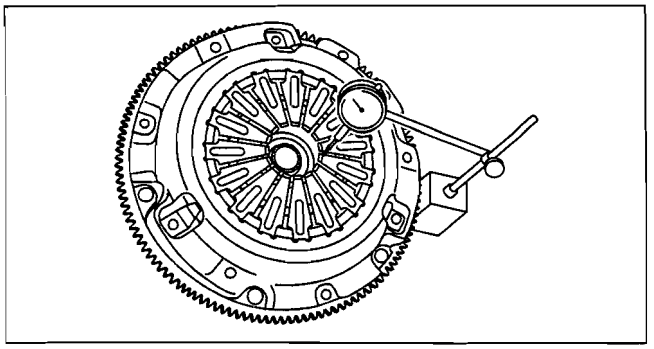
3. When checking the diaphragm spring fingers, mount a dial indicator on the cylinder block.



am3uuw0000019

4. Rotate the flywheel and check for misaligned diaphragm spring fingers.
   - If it exceeds the maximum specification, replace the clutch cover.

Clutch cover diaphragm spring fingers maximum height difference
1.0 mm {0.039 in}



am3uuw0000019

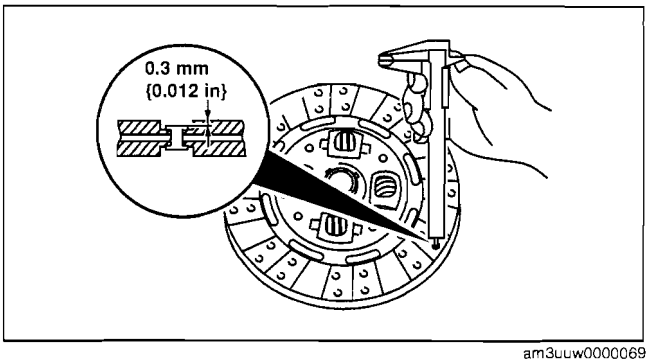
CLUTCH DISC INSPECTION

id051000800900

1. Remove the clutch disc.
2. Inspect the lining surface for discoloration and grease adhesion.
3. Inspect the torsion spring for weakness and the rivet for looseness.
4. Using a vernier caliper, measure the depth between the lining surface and the rivet head.

Clutch disc minimum depth
0.3 mm {0.012 in}

- If it is less than the minimum specification, replace the clutch disc.



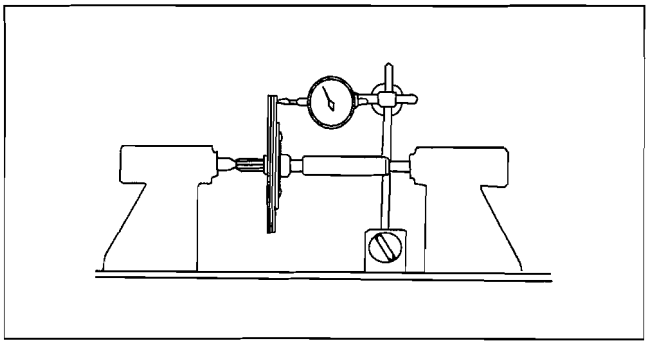
am3uuw0000069

5. Measure the clutch disc runout using a dial gauge.

Clutch disc maximum runout
0.7 mm {0.028 in}

- If it exceeds the maximum specification, replace the clutch disc.

6. Install the clutch disc.



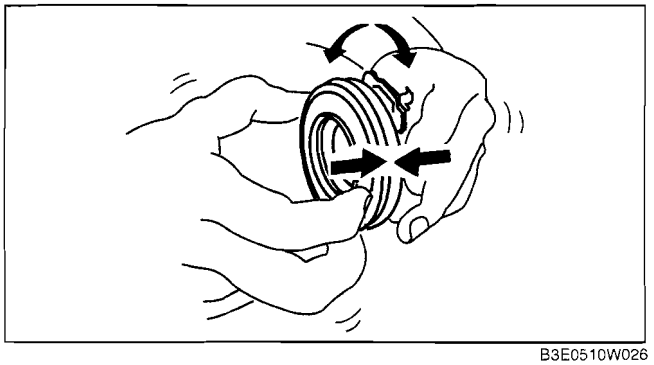
am3uuw0000070

CLUTCH RELEASE COLLAR INSPECTION

id051000801000

Caution
- **Do not clean the clutch release collar with cleaning fluids or a steam cleaner because it is filled with grease.**

1. Remove the clutch release collar.
2. Turn the collar while applying force in the axial direction, and inspect for sticking, excessive resistance, and an abnormal noise.
   - If there is any malfunction, replace the clutch release collar.
3. Install the clutch release collar.

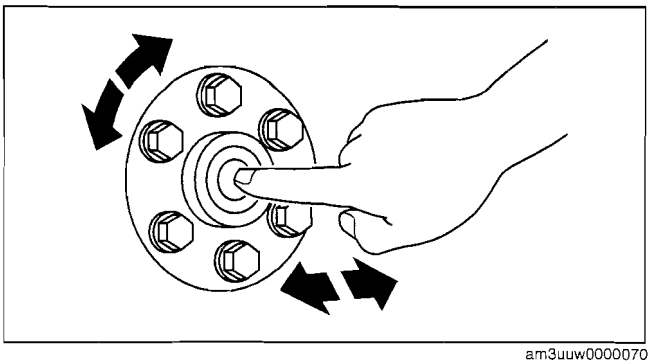


B3E0510W026

PILOT BEARING INSPECTION

id051000800200

1. Without removing the pilot bearing, turn the bearing while applying force in the axial direction.
   - If there is any malfunction, replace the pilot bearing.



am3uuw0000070

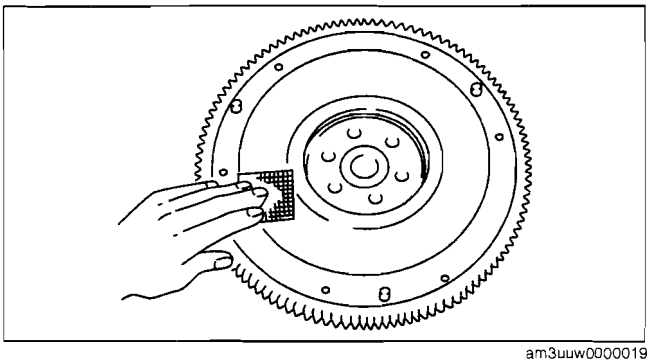
FLYWHEEL INSPECTION[LF, L3]

id0510008001d1

1. Remove the flywheel.

Note
- Correct slight scratches and discoloration using sandpaper.
- Inspect the runout of the surface that contacts the clutch disc with the flywheel installed to the crankshaft.

2. Inspect the surface that contacts the clutch disc for scratches, nicks, and discoloration.
3. Inspect the ring gear teeth for damage and wear.
4. Install the flywheel.

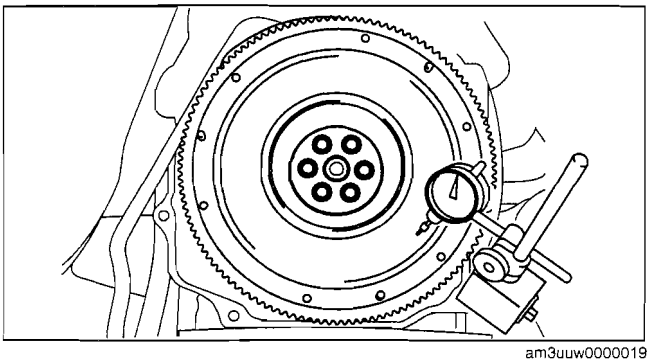


am3uuw0000019

5. Measure the runout of the surface that contacts the clutch disc using a dial gauge.

Flywheel maximum runout [LF, L3]
0.1 mm {0.004 in}

- If it exceeds the maximum specification, replace the flywheel.



am3uuw0000019

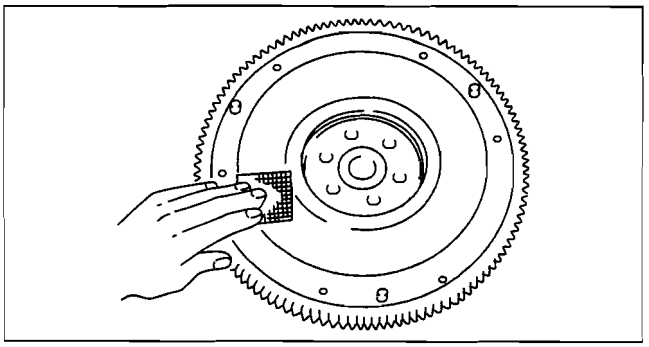
DUAL-MASS FLYWHEEL INSPECTION[L3 WITH TC]

id0510008020d5

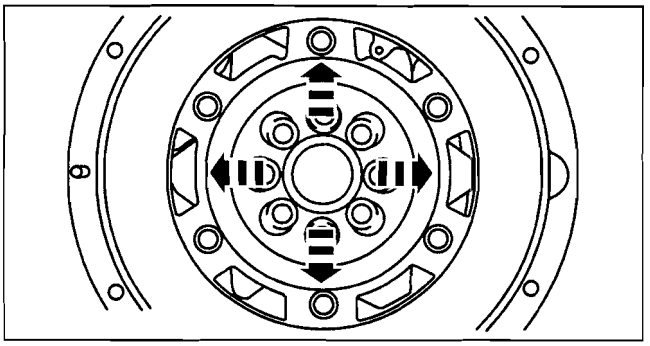
Caution
- **Do not rework the dual-mass flywheel if it is distorted.**
- **Do not clean the dual-mass flywheel with any kind of fluid. Clean the dual-mass flywheel with a dry cloth only.**
- **Do not clean the gap between the primary and secondary mass. Only clean the bolt connection surface and the clutch surface.**

1. Remove the dual-mass flywheel.

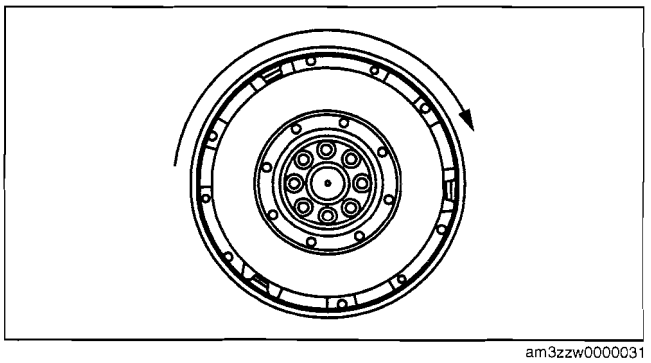
Note
- Correct slight scratches and discoloration using sandpaper.
- Inspect the runout of the surface that contacts the clutch disc with the dual-mass flywheel installed to the crankshaft.


am3zzw0000031

2. Inspect the dual-mass flywheel.
   — Cracks
   — Worn ring gear teeth
   — Chipped or cracked ring gear teeth
   — Surface that contacts the clutch disc for scratches, nicks, and discoloration.
   - If there is any malfunction, replace the dual-mass flywheel.
3. Verify that the center of the dual-mass flywheel does not move.
   (1) Rotate the dual-mass flywheel or attempt to move it up and down, and left and right to verify that the center of the dual-mass flywheel does not move.
   - If there is any movement as indicated by the arrows in the figure, replace the dual-mass flywheel with a new one.


am3zzw0000031

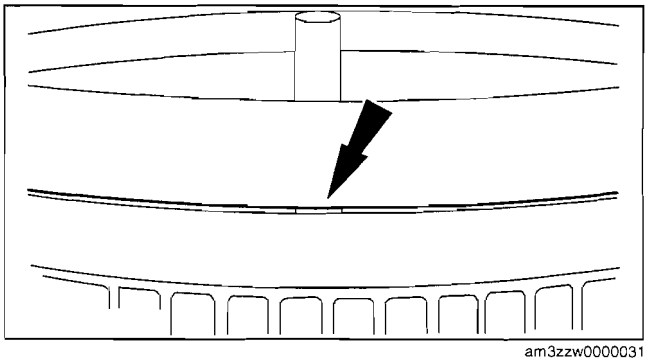
4. Verify that the secondary mass rotates by 15 teeth or more.
   - If it rotates by 15 teeth or more, replace the dual-mass flywheel.


am3zzw0000031

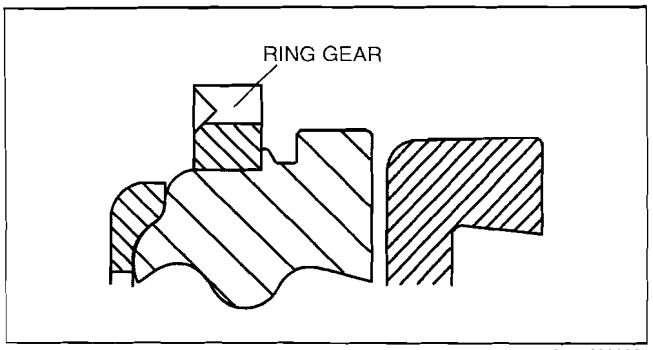
5. Inspect for locating dowels touching the primary mass of the dual-mass flywheel.

Caution
- **Make sure that the three locating dowels are installed.**

- If the locating dowels are touching the primary mass of the dual-mass flywheel, replace the dual-mass flywheel with a new one.
6. Visually inspect the secondary mass.
   - If there is any damage, replace the dual-mass flywheel.

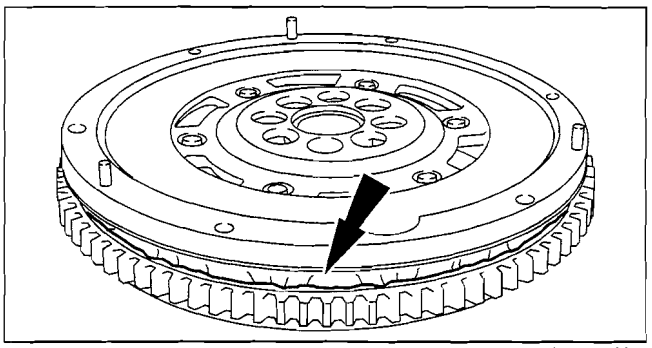

am3zzw0000031

7. Visually inspect the ring gear on the dual-mass flywheel.
   - If there is any damage, replace the dual-mass flywheel.



am3zzw0000031

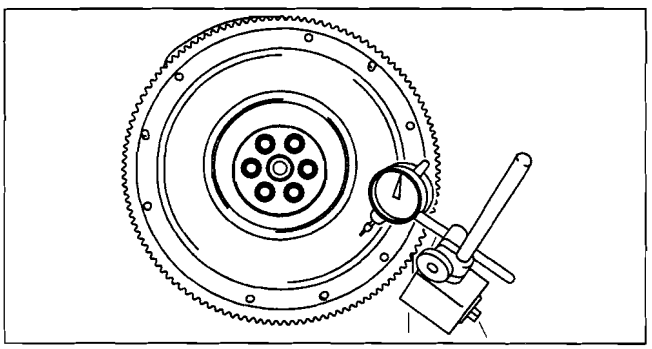
8. Inspect the welded area of the dual-mass flywheel for grease leakage.
   - If there is grease leakage, replace the dual-mass flywheel.


am3zzw0000031

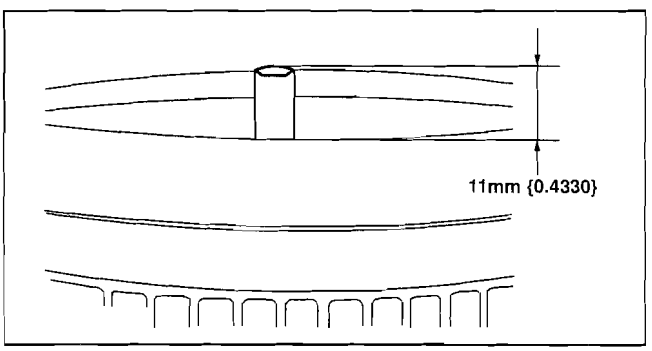
9. Inspect the dual-mass flywheel runout.

   Dual-mass flywheel maximum runout [A26M-R]
   1.5 mm {0.059 in}

   - If it is more than the maximum specification, replace the dual-mass flywheel.

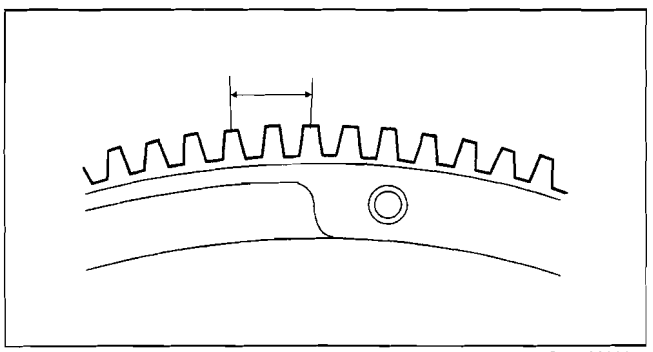

am3zzw0000031

10. Inspect the dual-mass flywheel for the amount of guide pin projection.
    - If not within the specification, replace the dual-mass flywheel.



am3zzw0000031

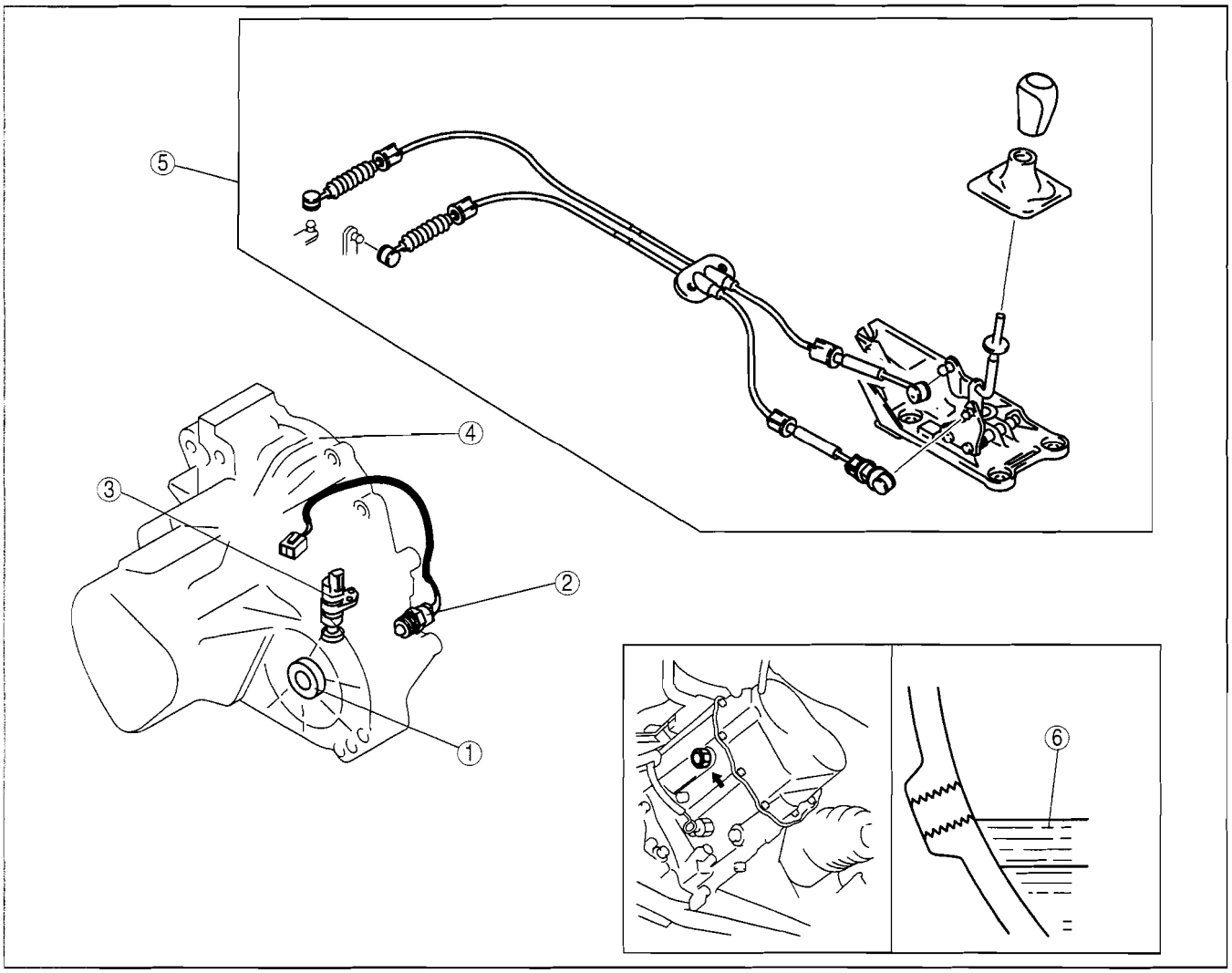
11. Rotate the secondary mass left and right and verify that it rotates within a range of three teeth without resistance.
    - If there is any malfunction, replace the dual-mass flywheel.
12. Inspect the dual-mass flywheel for cracks.
    - If there are cracks, replace the dual-mass flywheel.


am3uuw0000018

05-15A MANUAL TRANSAXLE [G35M-R]

MANUAL TRANSAXLE LOCATION INDEX[G35M-R]

id0515b1800500



c3u0515w001

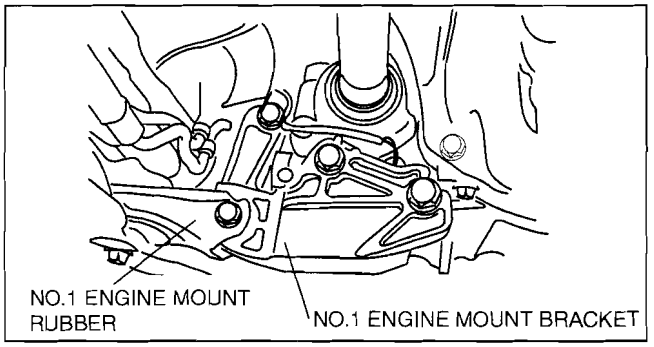
1	Oil seal (differential) (See 05-15A-4 OIL SEAL (DIFFERENTIAL) REPLACEMENT[G35M-R])
2	Neutral switch (See 05-15A-2 NEUTRAL SWITCH REMOVAL/INSTALLATION[G35M-R].) (See 01-40A-46 NEUTRAL SWITCH INSPECTION[LF, L3].)

3	Vehicle speed sensor (See 05-15A-4 VEHICLE SPEED SENSOR REMOVAL/INSTALLATION (WITHOUT ABS)[G35M-R].) (See 05-15A-5 VEHICLE SPEED SENSOR INSPECTION (WITHOUT ABS)[G35M-R].)
4	Manual transaxle (See 05-15A-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R])
5	Shift mechanism (See 05-16-1 SHIFT MECHANISM REMOVAL/INSTALLATION[G35M-R])
6	Transaxle oil (See 05-15A-3 TRANSAXLE OIL INSPECTION[G35M-R]) (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R])

NEUTRAL SWITCH REMOVAL/INSTALLATION[G35M-R]

id0515b1800700

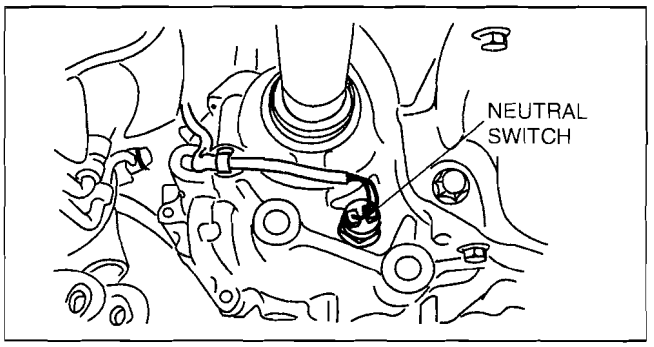
1. Remove the under cover.
2. Remove the No.1 engine mount rubber and No.1 engine mount bracket.



am3uuw0000071

3. Remove the neutral switch.
4. Install the neutral switch (with a new packing) to the transaxle case.

Tightening torque
19.6—29.4 N·m
{2.0—2.9 kgf·m, 14.5—21.6 ft·lbf}

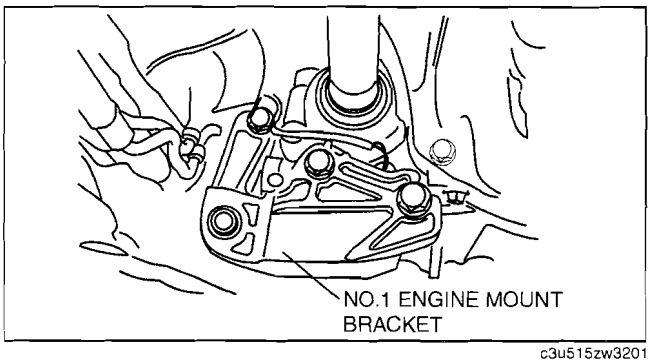


am3uuw0000072

5. Install the No.1 engine mount bracket.

Tightening torque
93.1—116.6 N·m
{9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

6. Install the No.1 engine mount rubber. (See 05-15A-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R].)
7. Install the under cover.



c3u515zw3201

TRANSAXLE OIL INSPECTION[G35M-R]

id0515b1800000

1. Park the vehicle on level ground.
2. Remove the under cover.
3. Remove the oil level plug and washer.
4. Verify that the oil is near the brim of the plug port.
   - If the oil level is lower than the low level, add the specified amount and type of oil through the oil level plug hole.

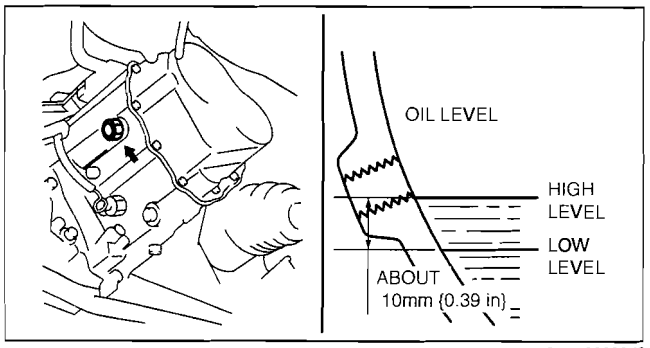
   Specified oil grade
   API Service GL-4 or GL-5

   Specified oil viscosity
   All-season: SAE 75W-90
   Above 10 °C {50 °F}: SAE 80W-90

5. Install a new washer and the oil level plug.

   Tightening torque
   39—59 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

6. Install the under cover.



am3uuw0000072

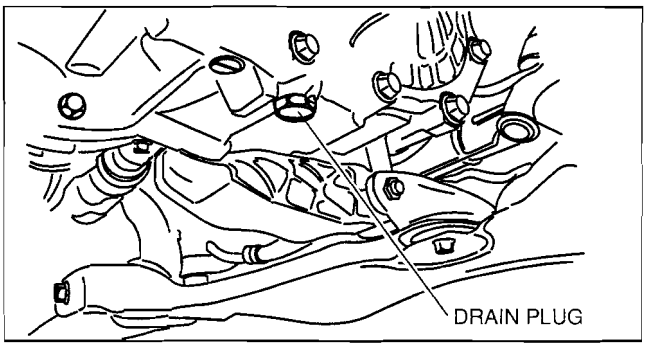
05-15A

TRANSAXLE OIL REPLACEMENT[G35M-R]

id0515b1800100

1. Remove the under cover.
2. Remove the drain plug with the washer.
3. Drain the oil into a suitable container.
4. Install a new washer and the drain plug.

   Tightening torque
   39—59 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}



c3u0515w101

5. Remove the oil level plug with washer and add the specified amount and type of oil through the oil level plug hole until the level reaches the bottom of the oil level plug hole.

   Manual transaxle oil Grade
   API Service GL-4 or GL-5

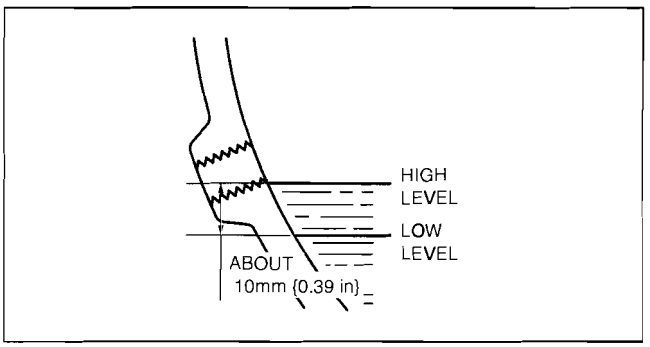
   Manual transaxle oil Viscosity
   All-season: SAE 75W-90
   Above 10 °C {50 °F}: SAE 80W-90

   Manual transaxle oil capacity (approx. quantity)
   2.87 L {3.03 US qt, 2.53 Imp qt}

6. Install a new washer and the oil level plug.

   Tightening torque
   39—59 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

7. Install the under cover.

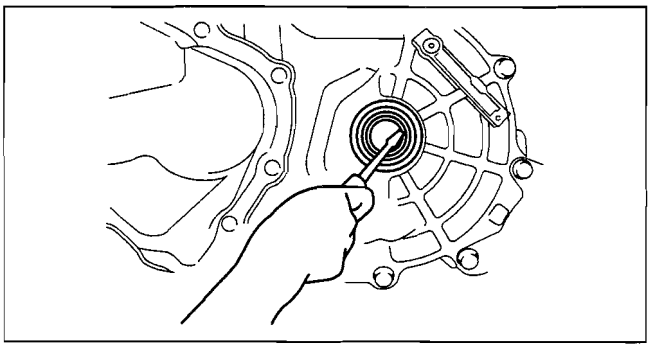


a6e5112w008

OIL SEAL (DIFFERENTIAL) REPLACEMENT[G35M-R]

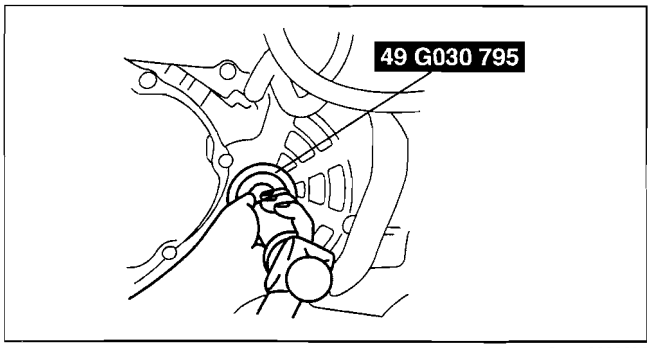
id0515b1800200

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Drain the oil from the transaxle.
3. Remove the front wheels and splash shields.
4. Separate the drive shaft and joint shaft from the transaxle. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
5. Remove the oil seals using a screwdriver.



am3uuw0000072

6. Using the **SST** and a hammer, tap each new oil seal in evenly until the **SST** contacts the transaxle case.
7. Coat the lip of each oil seal with transaxle oil.
8. Insert the drive shaft and joint shaft to the transaxle. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
9. Install the wheels and splash shields.
10. Add the specified amount and type of oil. (See 05-15A-3 TRANSAXLE OIL REPLACEMENT[G35M-R].)



am3uuw0000072

VEHICLE SPEED SENSOR REMOVAL/INSTALLATION (WITHOUT ABS)[G35M-R]

id0515b1801000

1. Disconnect the negative battery cable.
2. Remove the air cleaner component, battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the vehicle speed sensor connector.
4. Remove the vehicle speed sensor.
5. Apply transaxle oil to a new O-ring and install it on a new vehicle speed sensor.
6. Install the vehicle speed sensor.

Tightening torque
7.9—11.2 N·m {80—115 kgf·cm, 69.5—99.8 in·lbf}

7. Connect the vehicle speed sensor connector.
8. Install the battery and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
9. Connect the negative battery cable.

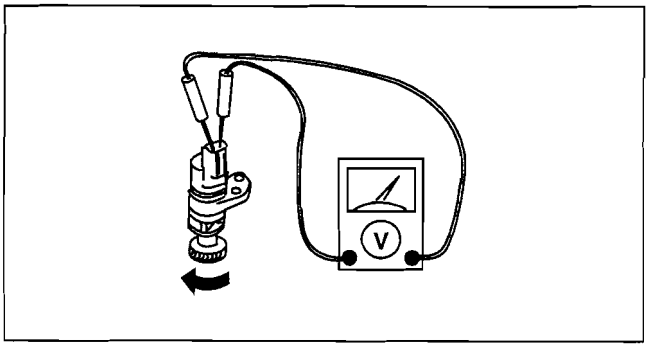
VEHICLE SPEED SENSOR INSPECTION (WITHOUT ABS)[G35M-R]

id0515b1801100

1. Remove the vehicle speed sensor.
   (See 05-15A-4 VEHICLE SPEED SENSOR REMOVAL/INSTALLATION (WITHOUT ABS)[G35M-R].)
2. Measure the voltage between the vehicle speed sensor terminals while the gear is turning.

Meter needle	Action
Moves slightly under 5 V (AC)	Inspect wiring harness between instrument cluster and vehicle speed sensor.
Does not move	Replace vehicle speed sensor.

3. Install the vehicle speed sensor.
   (See 05-15A-4 VEHICLE SPEED SENSOR REMOVAL/INSTALLATION (WITHOUT ABS)[G35M-R].)



am3uuw0000070

MANUAL TRANSAXLE REMOVAL/INSTALLATION[G35M-R]

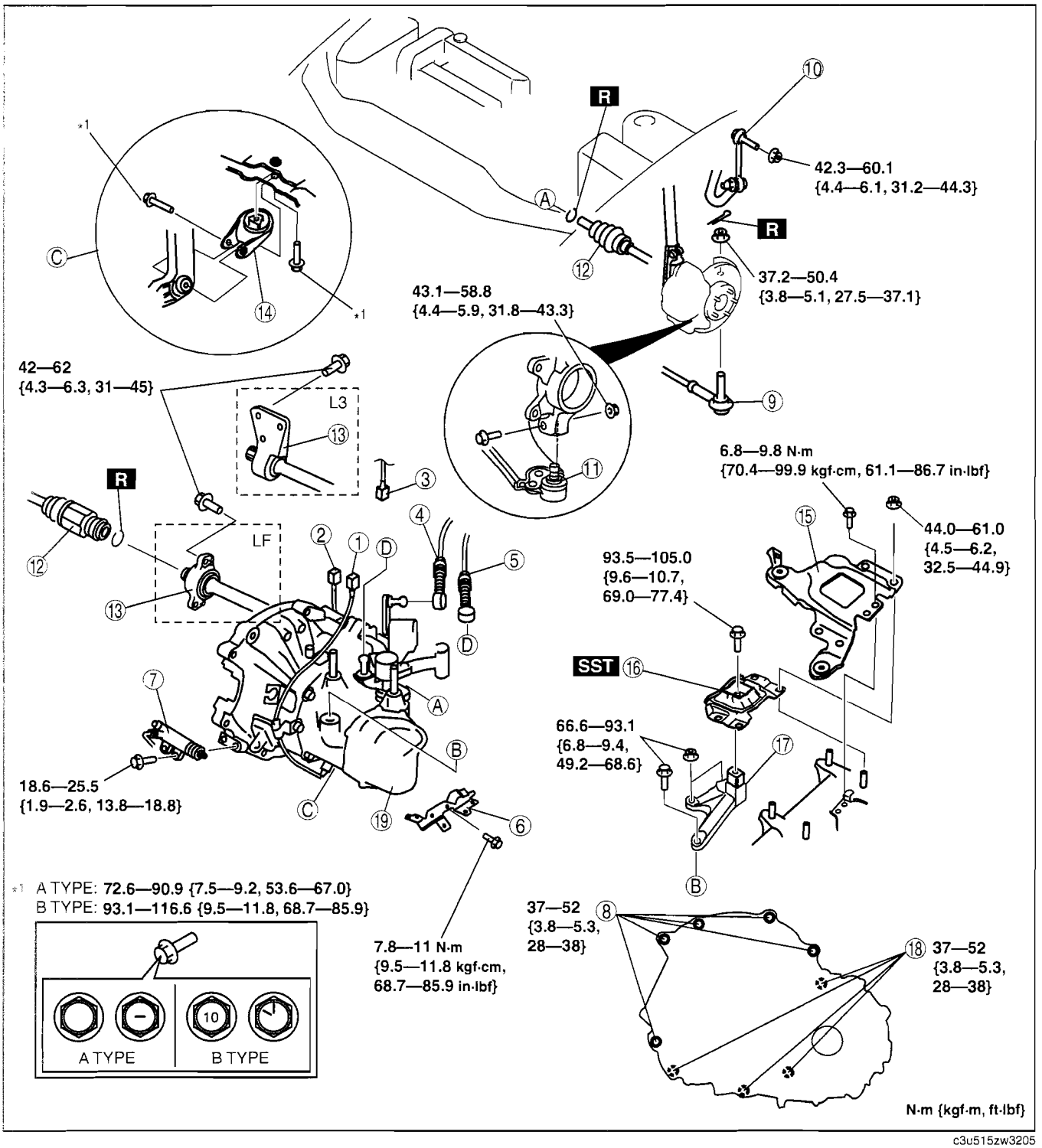
id0515b1800600

1. Remove the following parts:
   (1) Battery and battery tray
   (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Air cleaner component
   (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (3) Exhaust manifold insulator
   (4) Wheels, tires and splash shields
   (5) Under cover
   (6) Starter
   (See 01-19A-2 STARTER REMOVAL/INSTALLATION[LF, L3].)
2. Drain the transaxle oil into a suitable container.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

5. Add the specified amount of specified transaxle oil.

Note

- If the transaxle is overhauled, perform the "INSPECTION AFTER TRANSAXLE INSTALLATION" and verify that there is no abnormality.
  (See 05-15A-11 INSPECTION AFTER TRANSAXLE INSTALLATION[G35M-R].)



c3u515zw3205

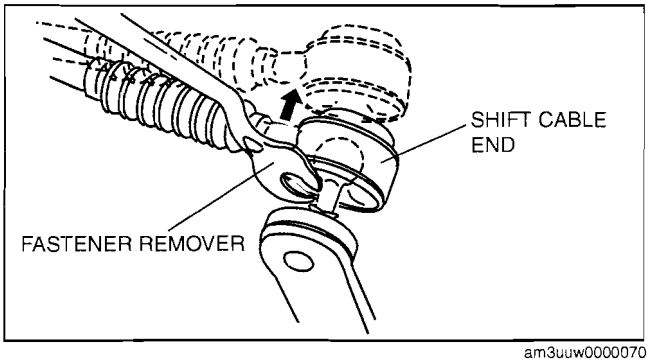
1	Back-up light switch connector
2	Neutral switch connector
3	Vehicle speed sensor connector (without ABS)

4	Select cable (See 05-15A-7 Shift Cable And Select Cable Removal Note.)

5	Shift cable (See 05-15A-7 Shift Cable And Select Cable Removal Note.)
6	Harness bracket
7	Clutch release cylinder
8	Transaxle mounting bolt (upper side)
9	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
10	Stabilizer control link
11	Lower arm ball joint
12	Drive shaft (See 03-13-9 DRIVE SHAFT REMOVAL/ INSTALLATION.)
13	Joint shaft (See 03-13-2 JOINT SHAFT REMOVAL/ INSTALLATION[LF].) (See 03-13-4 JOINT SHAFT REMOVAL/ INSTALLATION[L3, L3 WITH TC].)
14	No.1 engine mount rubber (See 05-15A-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
15	Battery tray bracket
16	No.4 engine mount rubber (See 05-15A-8 No.4 Engine Mount Removal Note.) (See 05-15A-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
17	No.4 engine mount bracket (See 05-15A-8 No.4 Engine Mount Removal Note.) (See 05-15A-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
18	Transaxle mounting bolt (lower side)
19	Manual transaxle (See 05-15A-9 Manual Transaxle Removal Note.) (See 05-15A-10 Manual Transaxle Installation Note.)

Shift Cable And Select Cable Removal Note

1. Remove the both shift cable end and select cable end using a fastener remover.



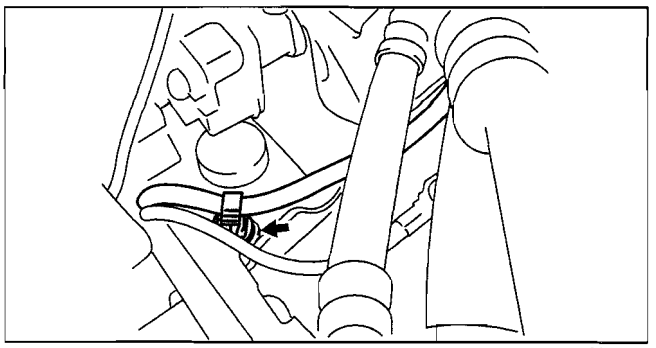
am3uuw0000070

No.4 Engine Mount Removal Note

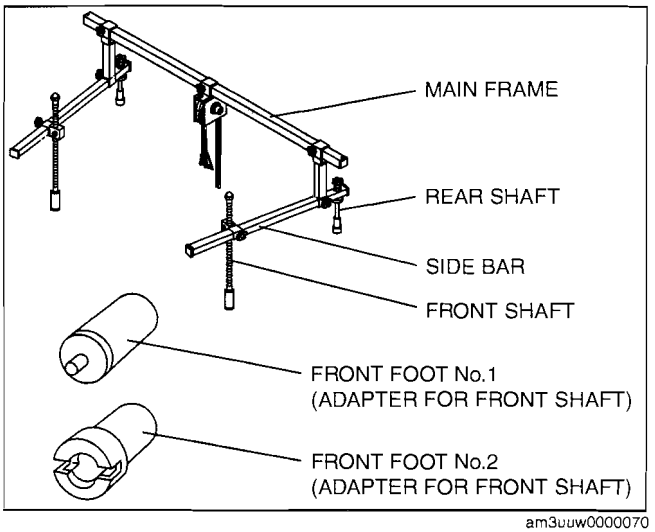
1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown in the figure.
2. Install the **SST** using the following procedure.

Caution

- **Refer to the SST instruction manual for the basic handing procedure.**

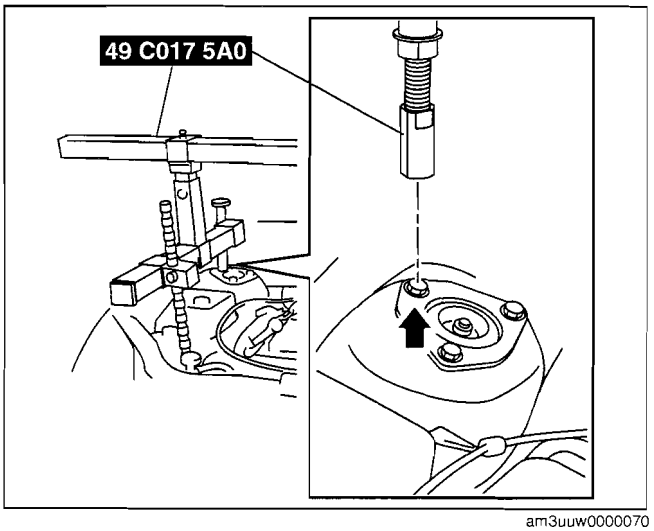


am3uuw0000070



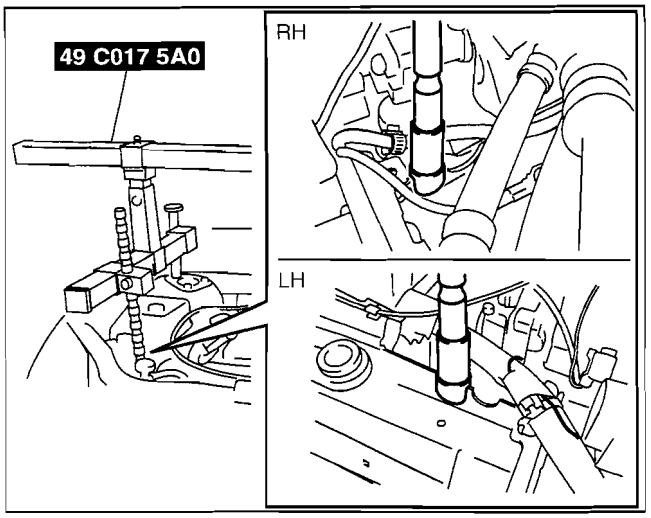
am3uuw0000070

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber (identical position to right side).



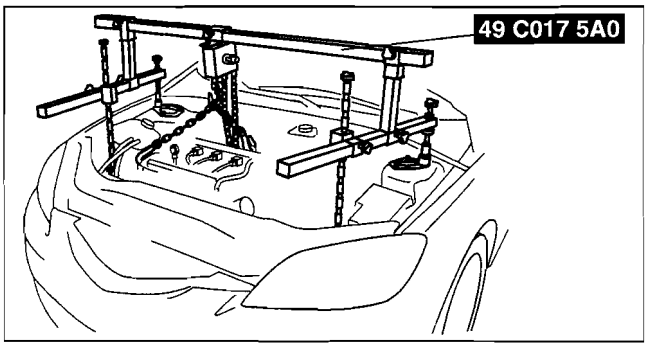
am3uuw0000070

(3) Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3uuw0000070

3. Suspend the engine using the **SST**.
4. Remove the battery tray bracket, No.4 engine mount rubber and bracket.

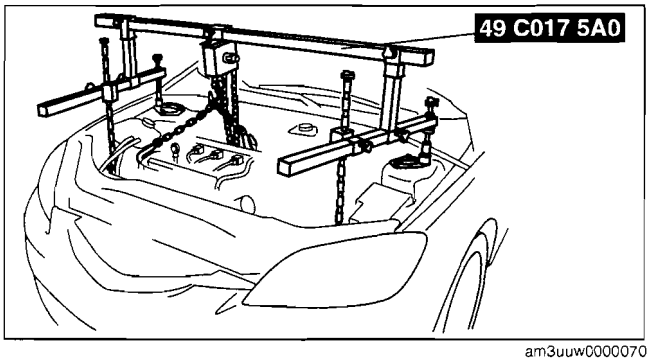


am3uuw0000070

Manual Transaxle Removal Note

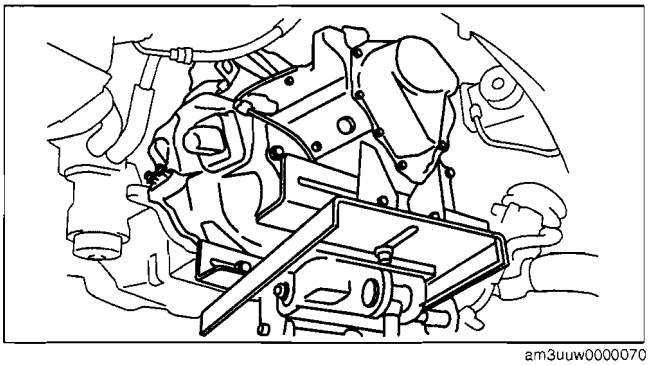
Warning
- **Remove the transaxle carefully, holding it steady. If the transaxle falls it could be damaged or cause injury.**

1. Lean the engine toward the transaxle.



am3uuw0000070

2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

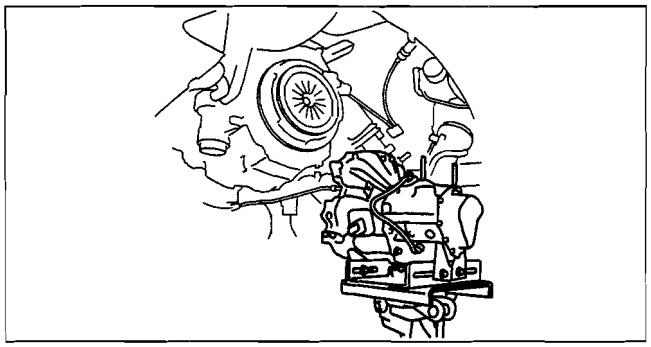

am3uuw0000070

Manual Transaxle Installation Note

Warning

- **Install the transaxle carefully, holding it steady. If the transaxle falls it could be damaged or cause injury.**

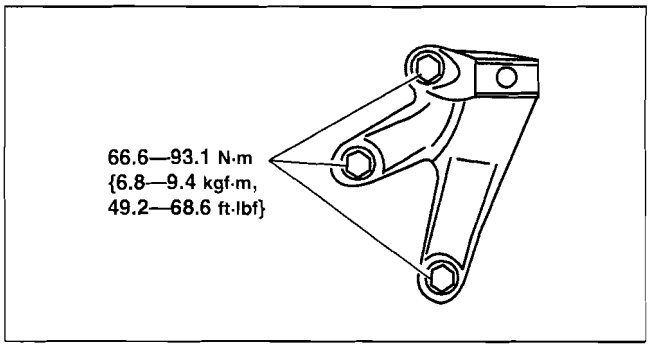
1. Set the transaxle on a jack and lift into place.
2. Install the transaxle mounting bolts.
3. Adjust the **SST** (49 C017 5A0) so that the engine is located at the specified position.



am3uuw0000071

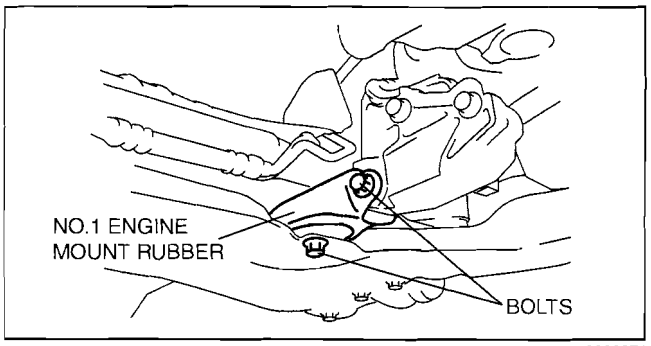
No.1 Engine Mount and No.4 Engine Mount Installation Note

1. Install the No.4 engine mount bracket on the transaxle case and tighten bolt and nuts.



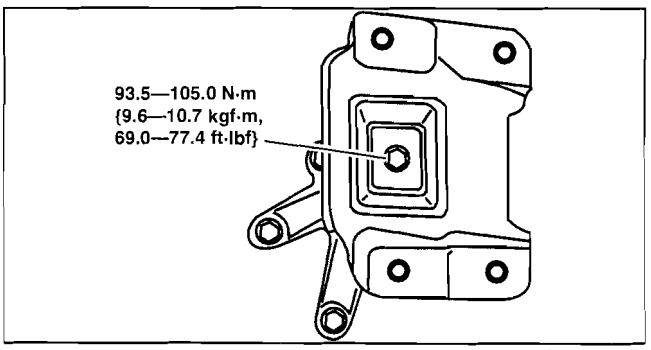
am3uuw0000071

2. install the No.1 engine mount rubber to the cross member and temporarily tighten bolts.



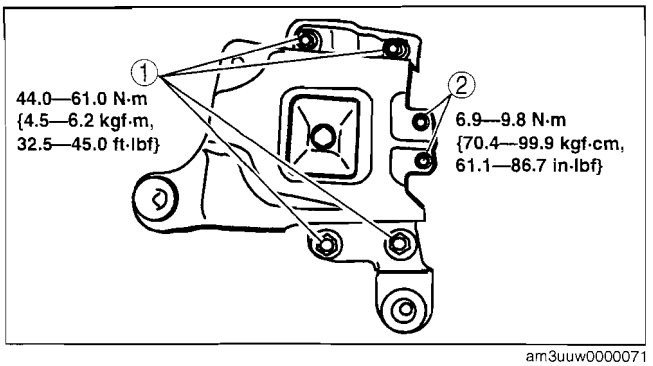
am3uuw0000071

3. Place the No.4 engine mount rubber with the body stud bolts passing through the holes and tighten the bolt in the figure.



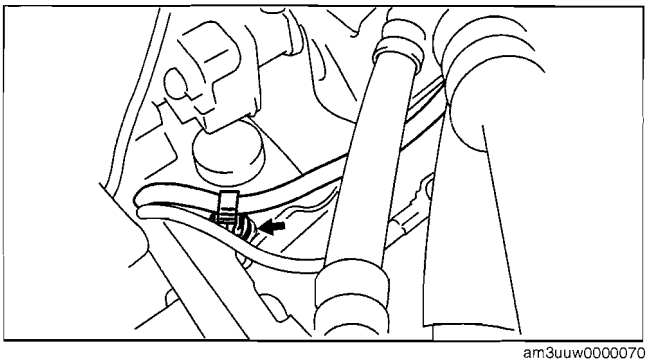
am3uuw0000071

4. Place the battery tray bracket on the No.4 Engine mount rubber with the body stud bolts passing through the holes and tighten bolts and nuts in the order shown in the figure.
5. Remove the **SST** (49 C017 5A0).



am3uuw0000071

6. Install the clip as shown in the figure.

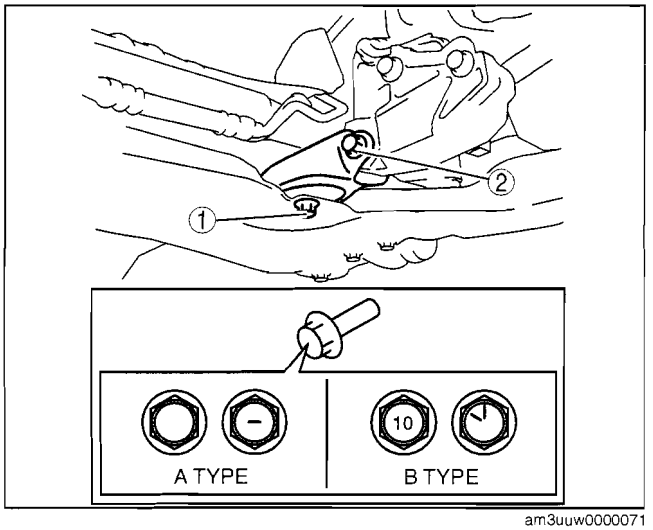

am3uuw0000070

7. Fully tighten the bolts.

Caution
- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

Bolt length (measured from below the head)
Front crossmember side: 62 mm {2.441 in}
No.1 engine mount bracket side: 65 mm {2.559 in}

Tightening torque
A type: 72.6—90.9 N.m {7.5—9.2 kgf.m, 53.6—67.0 ft.lbf}
B type: 93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}



am3uuw0000071

INSPECTION AFTER TRANSAXLE INSTALLATION[G35M-R]

id0515b1800300

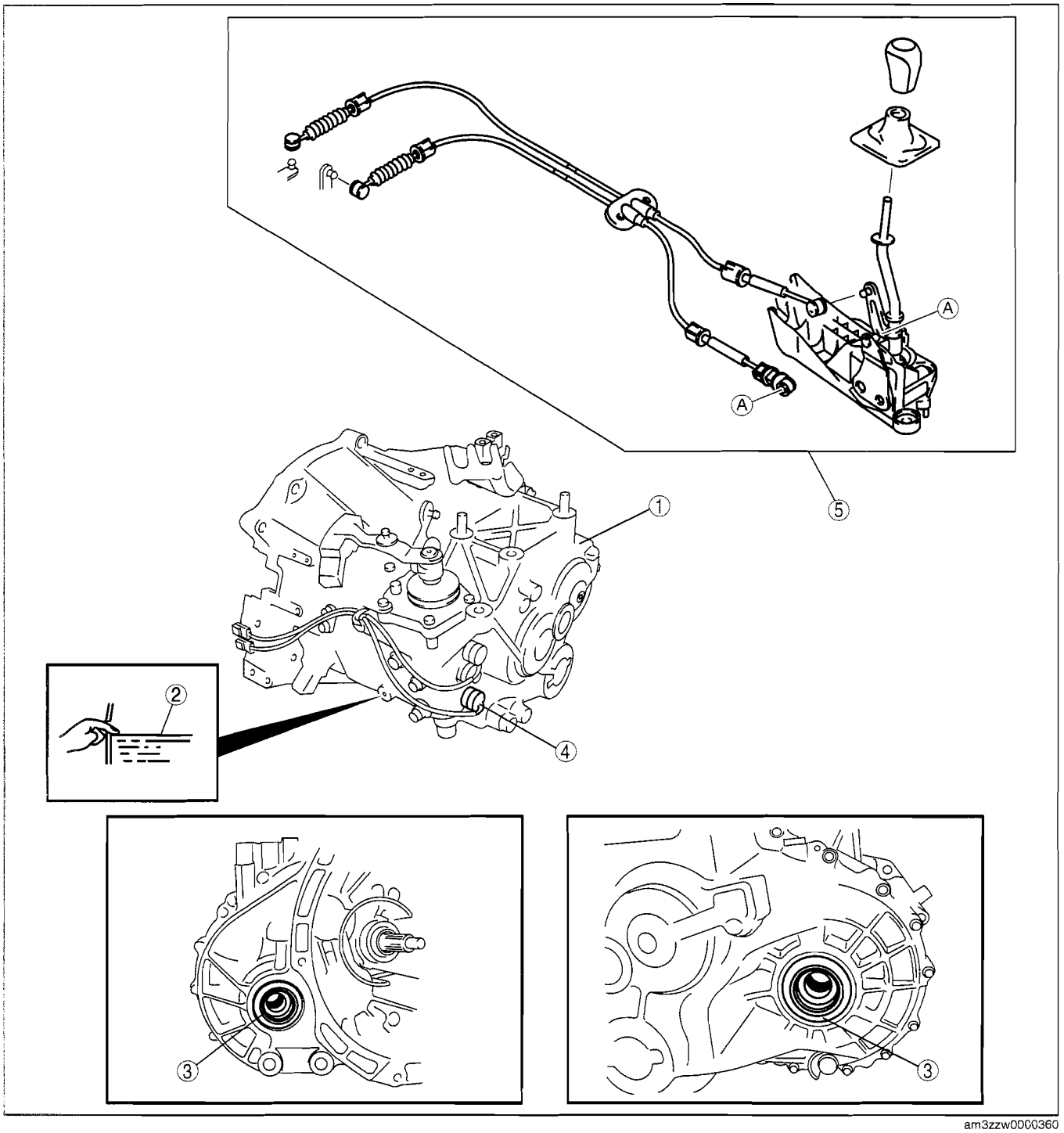
Note
- Perform the following inspection only when the transaxle has been overhauled.

1. Perform a road test and inspect the following items:
   (1) No abnormal noise in each shift position.
   (2) Smooth shift operation when shifting gears.
   (3) No gear slipout after shifting gears.
   (4) Back-up light switch operates correctly.

05-15B MANUAL TRANSAXLE [A26M-R]

MANUAL TRANSAXLE LOCATION INDEX[A26M-R]

id0515l1800500



am3zzw0000360

1	Manual transaxle (See 05-15B-5 MANUAL TRANSAXLE REMOVAL/ INSTALLATION[A26M-R])
2	Transaxle oil (See 05-15B-3 TRANSAXLE OIL INSPECTION[A26M-R]) (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R])
3	Oil seal (differential) (See 05-15B-4 OIL SEAL (DIFFERENTIAL) REPLACEMENT[A26M-R])

4	Neutral switch (See 05-15B-3 NEUTRAL SWITCH REMOVAL/ INSTALLATION[A26M-R]) (See 01-40B-22 NEUTRAL SWITCH INSPECTION[L3 WITH TC])
5	Shift mechanism (See 05-16-2 SHIFT MECHANISM REMOVAL/ INSTALLATION[A26M-R])

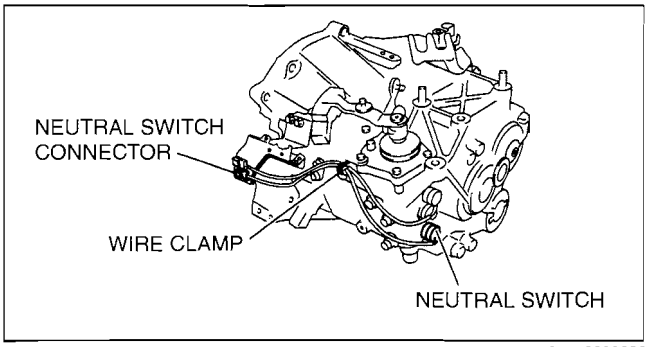
NEUTRAL SWITCH REMOVAL/INSTALLATION[A26M-R]

id0515l1800700

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the neutral switch connector.
4. Remove the neutral switch.
5. Install the neutral switch to the transaxle case.

Tightening torque
28.1—52.3 N·m {2.9—5.3 kgf·m, 20.8—38.5 ft·lbf}

6. Clamp both the neutral switch and back-up light switch wiring harnesses as shown in the figure.
7. Install the under cover.
8. Connect the negative battery cable.



am3zzw0000296

TRANSAXLE OIL INSPECTION[A26M-R]

id0515l1800000

1. Park the vehicle on level ground.
2. Remove the under cover.
3. Remove the oil level plug and washer.
4. Verify that the oil is near the brim of the plug port.
   - If the oil level is low, add the specified amount and type of oil through the filler plug hole.

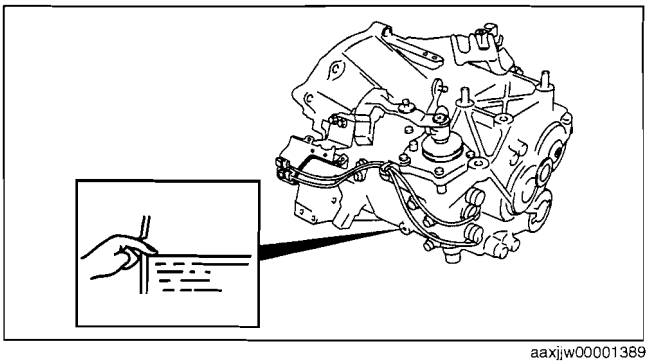
Manual transaxle oil Grade
API Service GL-4 or GL-5

Manual transaxle oil Viscosity
All-season: SAE 75W-90

5. Tighten the oil level plug with a new washer.

Tightening torque
27.5—50.9 N·m {2.8—5.1 kgf·m, 37.5—20.2 ft·lbf}

6. Install the under cover.



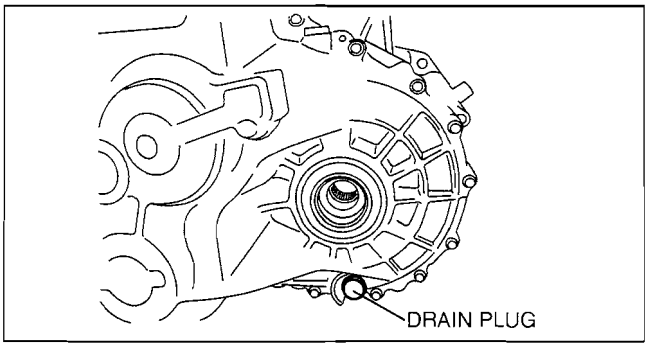
aaxjjw00001389

TRANSAXLE OIL REPLACEMENT[A26M-R]

id0515l1800100

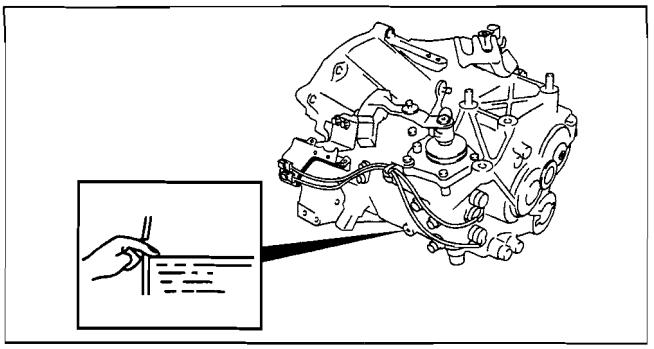
1. Park the vehicle on level ground.
2. Remove the under cover.
3. Remove the drain plug with the washer.
4. Drain the oil into a suitable container.
5. Install a new washer and the drain plug.

Tightening torque
27.5—50.9 N·m {2.8—5.1 kgf·m, 37.5—20.2 ft·lbf}



am3zzw0000314

6. Remove the oil level plug with washer and add the specified amount and type of oil through the oil level plug hole until the level reaches the bottom of the oil level plug hole.



aaxjjw00001389

Manual transaxle oil Grade
API Service GL-4 or GL-5

Manual transaxle oil Viscosity
All-season: SAE 75W-90

Manual transaxle oil Capacity (approx. quantity)
2.5 L {2.6 US qt, 2.2 Imp qt}

7. Install a new washer and the oil level plug.

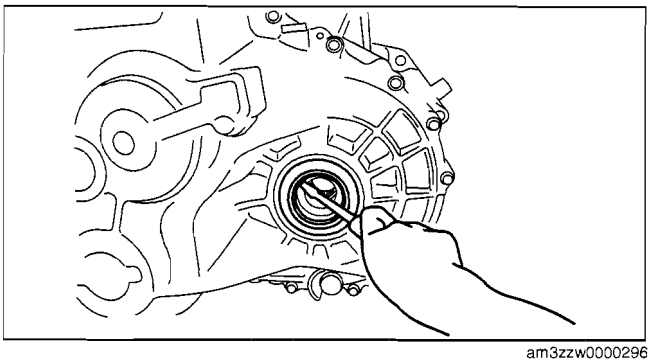
Tightening torque
27.5—50.9 N·m {2.8—5.1 kgf·m, 37.5—20.2 ft·lbf}

8. Install the under cover.

OIL SEAL (DIFFERENTIAL) REPLACEMENT[A26M-R]

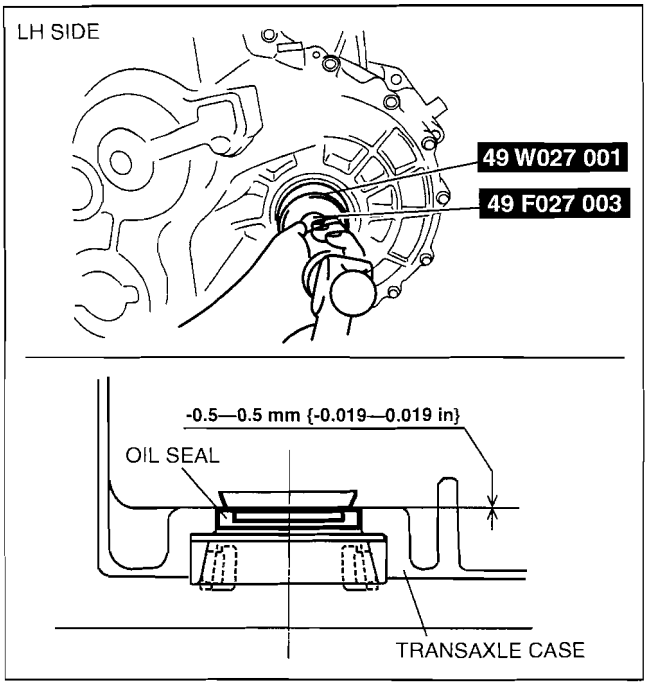
id0515l1800200

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Remove the under cover.
3. Drain the oil from the transaxle.
4. Remove the front wheels and splash shields.
5. Separate the drive shaft and joint shaft from the transaxle. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC])
6. Remove the oil seals using a screwdriver.



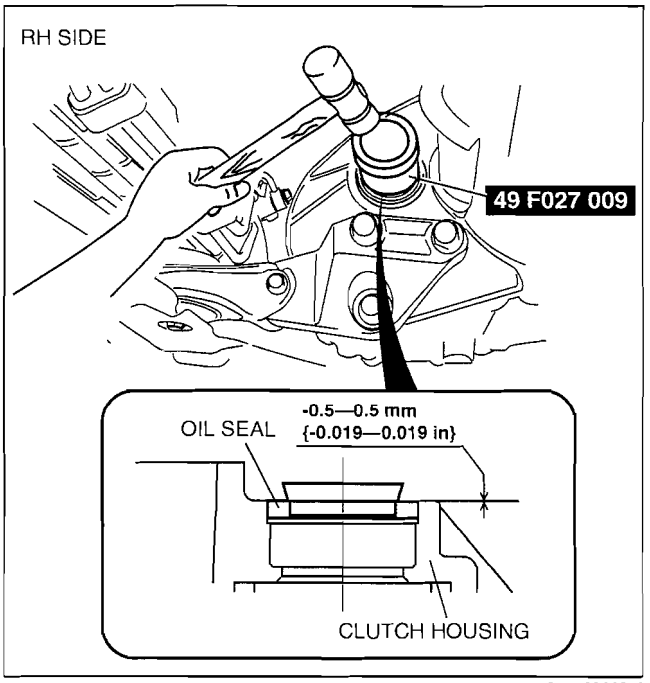
am3zzw0000296

7. Using the **SSTs** and a hammer, tap each new oil seal in evenly until the **SSTs** contact the transaxle case.



am3zzw0000348

8. Coat the lip of each oil seal with transaxle oil.
9. Insert the drive shaft and joint shaft to the transaxle. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC])
10. Install the wheels and splash shields.
11. Add the specified amount and type of oil. (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R].)
12. Install the under cover.



am3zzw0000349

MANUAL TRANSAXLE REMOVAL/INSTALLATION[A26M-R]

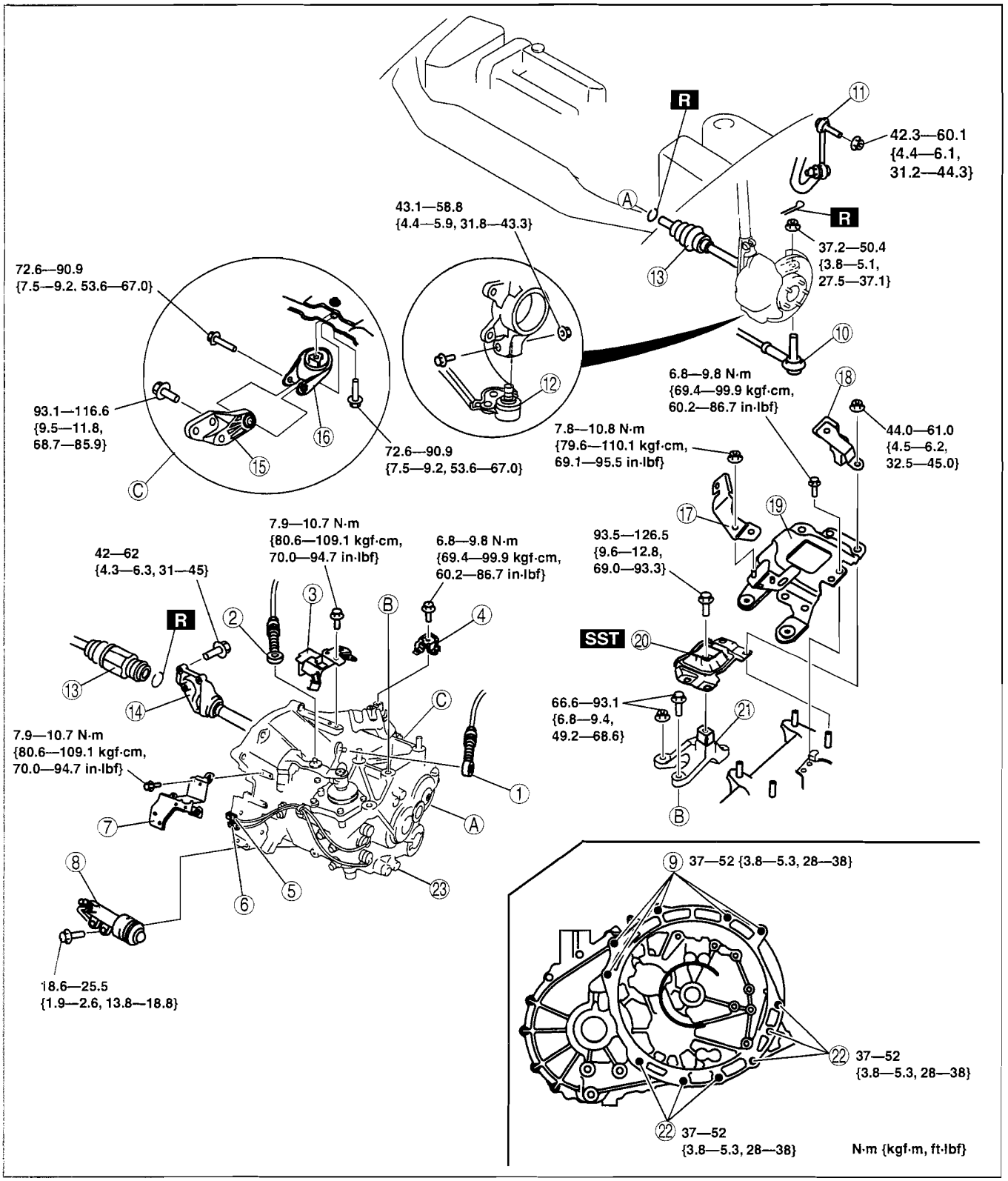
id0515l1800600

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray. (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC])
3. Remove the air cleaner component. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
4. Remove the charge air cooler. (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC])
5. Remove in the fuel pump resistor. (See 01-14B-20 FUEL PUMP RESISTOR REMOVAL/INSTALLATION[L3 WITH TC].)
6. Remove the front wheels.
7. Remove the under cover and splash shields.
8. Remove the mudguard. (LF side)
9. Remove the starter. (See 01-19B-2 STARTER REMOVAL/INSTALLATION[L3 WITH TC].)
10. Drain the transaxle oil into a suitable container.
11. Remove in the order indicated in the figure.
12. Install in the reverse order of removal.

13. Add the specified amount of specified transaxle oil. (See 05-15B-3 TRANSAXLE OIL REPLACEMENT[A26M-R].)

Note

- If the transaxle is overhauled and installed to the vehicle, perform the 'INSPECTION AFTER TRANSAXLE INSTALLATION' and verify that there is no abnormality.
  (See 05-15B-11 INSPECTION AFTER TRANSAXLE INSTALLATION[A26M-R].)

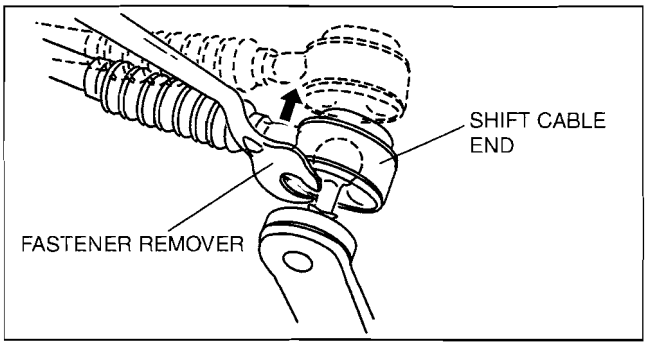


am3zzw0000300

1	Selector cable (See 05-15B-7 Shift Cable And Select Cable Removal Note.)
2	Shift cable (See 05-15B-7 Shift Cable And Select Cable Removal Note.)
3	Wiring harness bracket
4	Cable bracket
5	Back-up light switch connector
6	Neutral switch connector
7	Wiring harness bracket
8	Clutch release cylinder
9	Transaxle mounting bolt (upper side)
10	Tie-rod end ball joint (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
11	Stabilizer control link
12	Lower arm ball joint
13	Drive shaft
14	Joint shaft (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
15	No.1 engine mount bracket (See 05-15B-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
16	No.1 engine mount rubber (See 05-15B-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
17	Wiring harness bracket
18	Dynamic damper
19	Battery tray bracket
20	No.4 engine mount rubber (See 05-15B-8 No.4 Engine Mount Removal Note.) (See 05-15B-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
21	No.4 engine mount bracket (See 05-15B-8 No.4 Engine Mount Removal Note.) (See 05-15B-10 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
22	Transaxle mounting bolt (lower side)
23	Manual transaxle (See 05-15B-9 Manual Transaxle Removal Note.) (See 05-15B-10 Manual Transaxle Installation Note.)

Shift Cable And Select Cable Removal Note

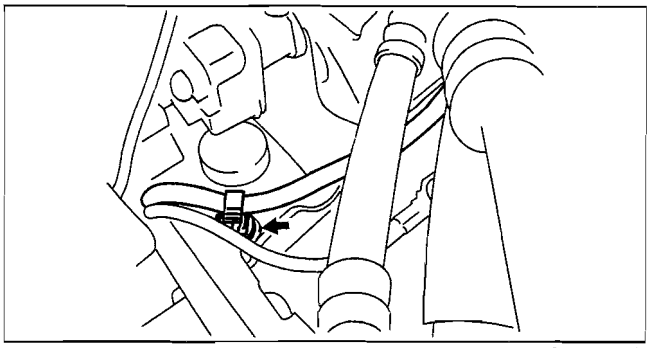
1. Remove the both shift cable end and select cable end using a fastener remover.



am3zzw0000041

No.4 Engine Mount Removal Note

1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown in the figure.

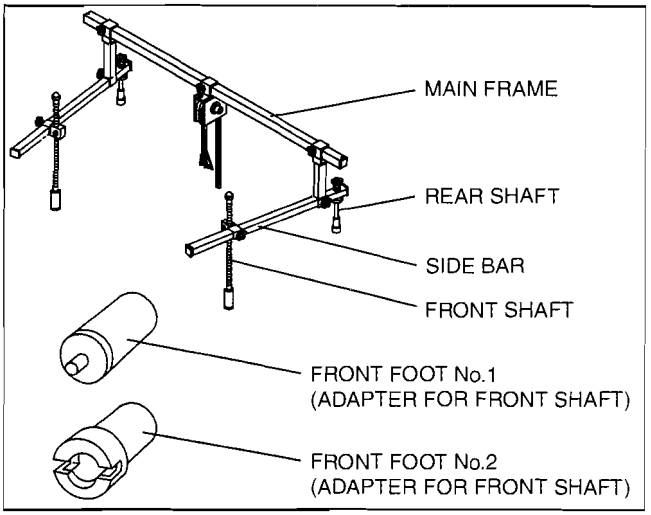


am3zzw0000042

2. Install the SST using the following procedure.

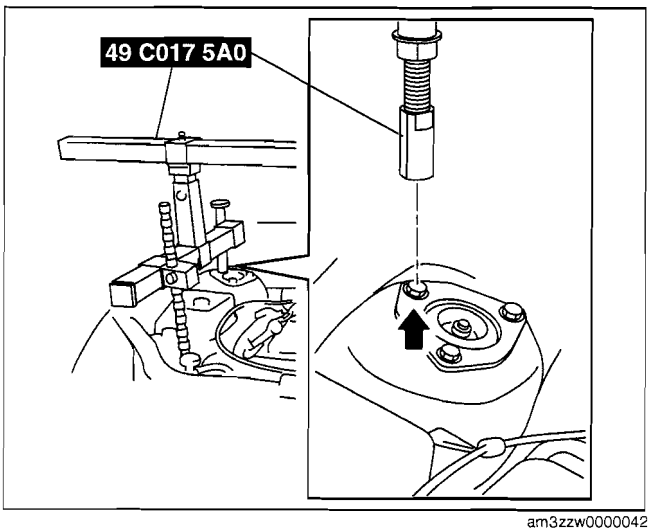
Caution

- **Refer to the SST instruction manual for the basic handing procedure.**



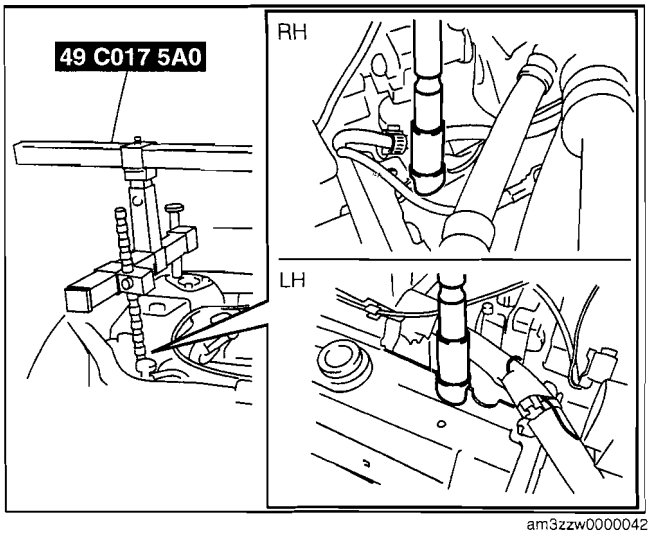
am3zzw0000042

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber (Identical position to right side).



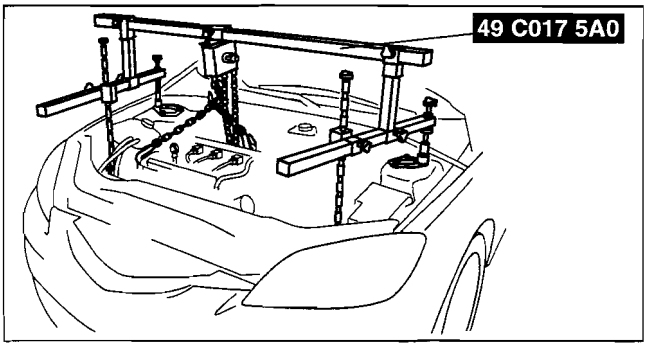
am3zzw0000042

(3) Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3zzw0000042

3. Support the engine using the **SST**.
4. Remove the battery tray bracket, No.4 engine mount rubber and bracket.

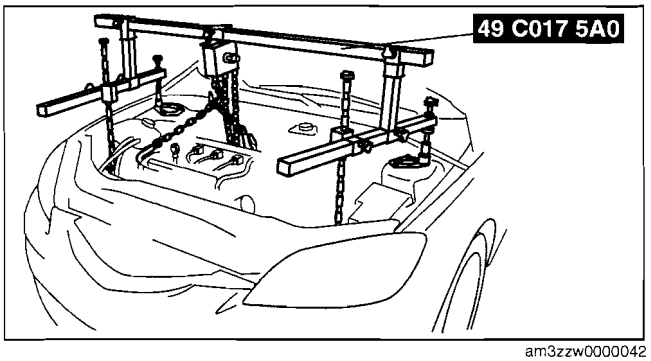


am3zzw0000042

Manual Transaxle Removal Note

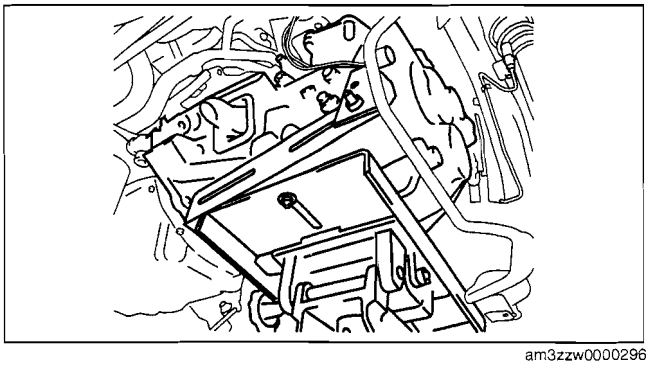
Warning
- **Remove the transaxle carefully, holding it steady. If the transaxle falls it could be damaged or cause injury.**

1. Adjust the **SST** and lean the engine toward the transaxle.



am3zzw0000042

2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

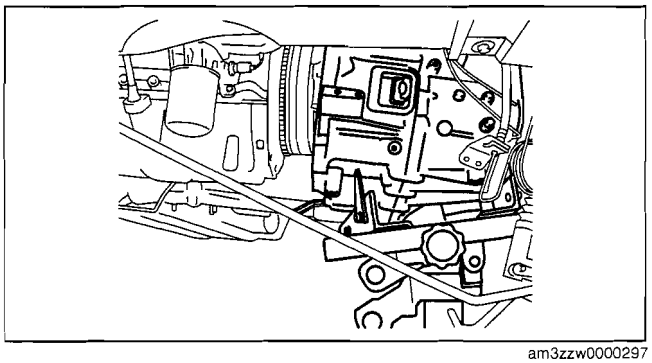

am3zzw0000296

Manual Transaxle Installation Note

Warning

- **Install the transaxle carefully, holding it steady. If the transaxle falls it could be damaged or cause injury.**

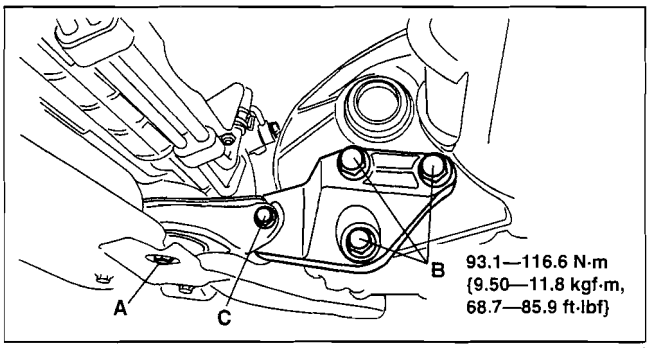
1. Set the transaxle on a jack and lift into place.
2. Install the transaxle mounting bolts.
3. Adjust the **SST** (49 C017 5A0) so that the engine is located at the specified position.



am3zzw0000297

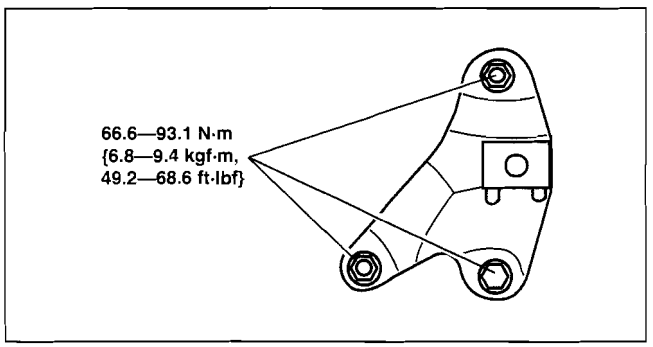
No.1 Engine Mount and No.4 Engine Mount Installation Note

1. Install the No.1 engine mount bracket to the transaxle.
2. Install the No.1 engine mount rubber.
3. Tighten the bolts B, and then temporarily tighten the bolt A and C.



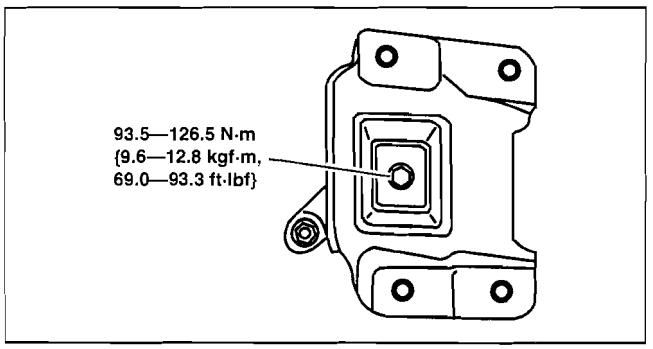
am3zzw0000298

4. Install the No.4 engine mount bracket on the transaxle case and tighten bolt and nuts.



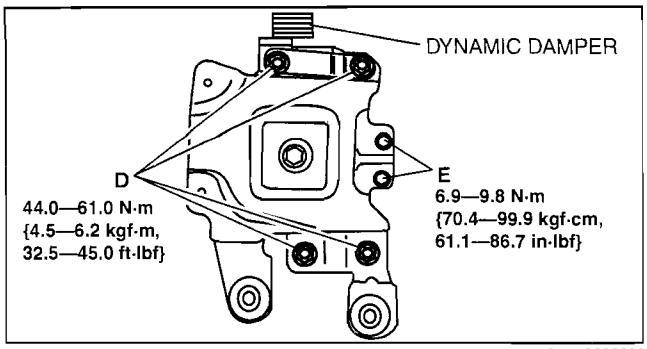
am3zzw0000298

5. Place the No.4 engine mount rubber with the body stud bolts passing through the holes and tighten the bolt as shown in the figure.
6. Place the battery tray bracket over the No.4 engine mount bracket with the body stud bolts passing through the holes.



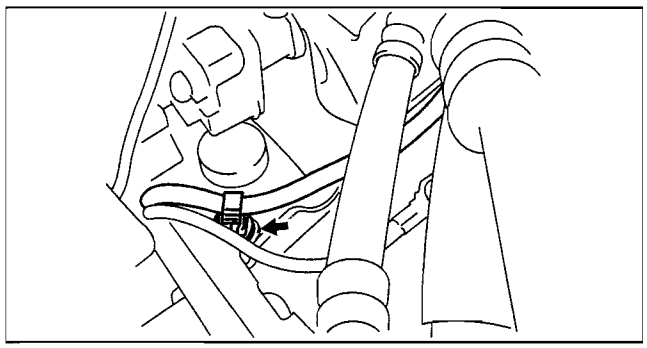
am3zzw0000298

7. Place the dynamic damper over the battery tray bracket with the body stud bolts passing through the holes, then tighten the bolts and nuts in the order of D, E.
8. Remove the **SST** (49 C017 5A0).



am3zzw0000298

9. Install the clip as shown in the figure.

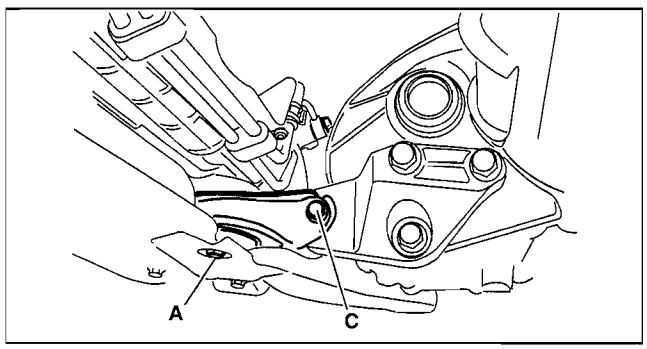

am3zzw0000042

10. Fully tighten the bolts in the order of A, C.

Caution
- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

Bolt length (measured from below the head)
Front crossmember side: 62 mm {2.441 in}
No.1 engine mount bracket side: 65 mm {2.559 in}

Tightening torque
72.6—90.9 N·m {7.5—9.2 kgf·m, 53.6—67.0 ft·lbf}



am3zzw0000298

INSPECTION AFTER TRANSAXLE INSTALLATION[A26M-R]

id0515l1800300

Note
- Perform the following inspection only when the transaxle has been overhauled.

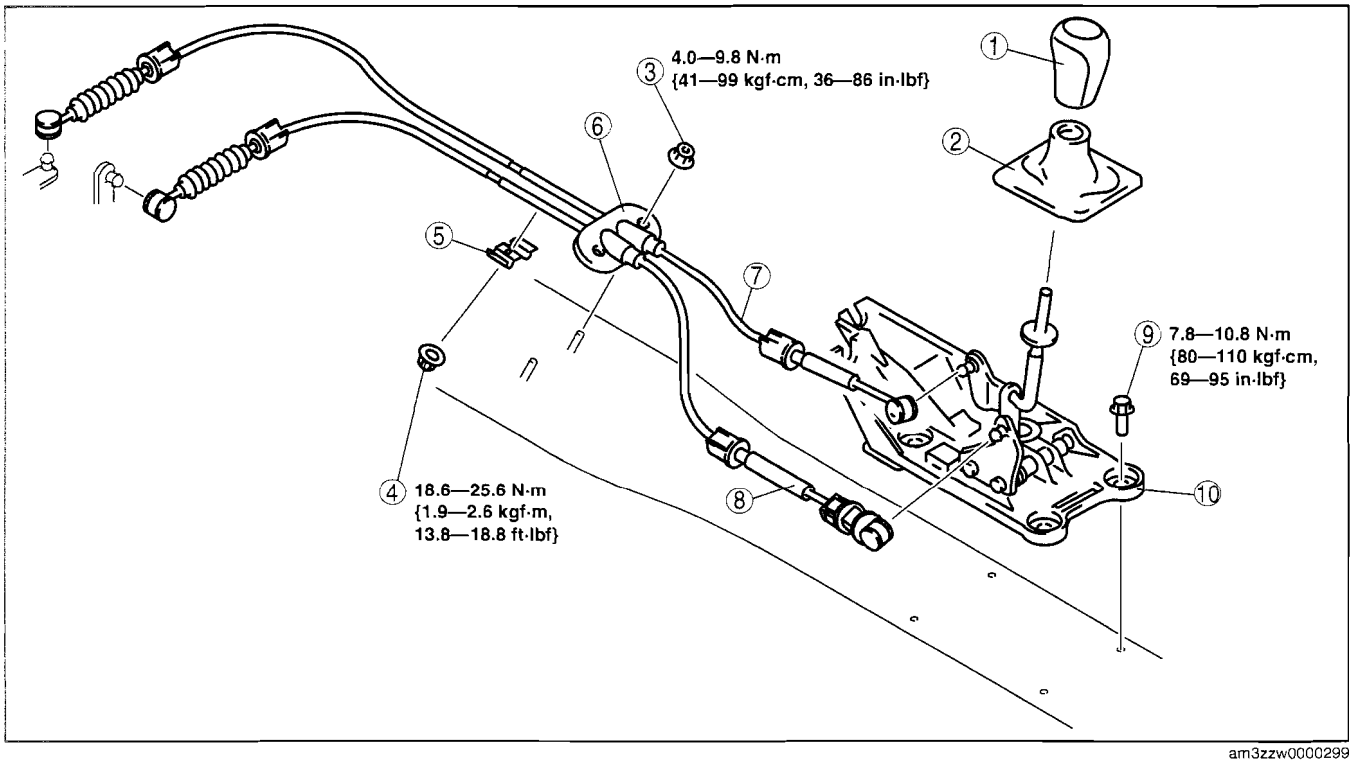
1. Perform a road test and inspect the following items:
   (1) No abnormal noise in each shift position.
   (2) Smooth shift operation when shifting gears.
   (3) No gear slipout after shifting gears.
   (4) Back-up light switch operates correctly.

05-16 MANUAL TRANSAXLE SHIFT MECHANISM

SHIFT MECHANISM REMOVAL/INSTALLATION[G35M-R]

id0516008000b5

1. Remove the following parts:
   (1) battery and battery tray
   (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Center console
   (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (3) Heat insulator (Front)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. After installation, verify that the shift lever can be shifted smoothly into each position.



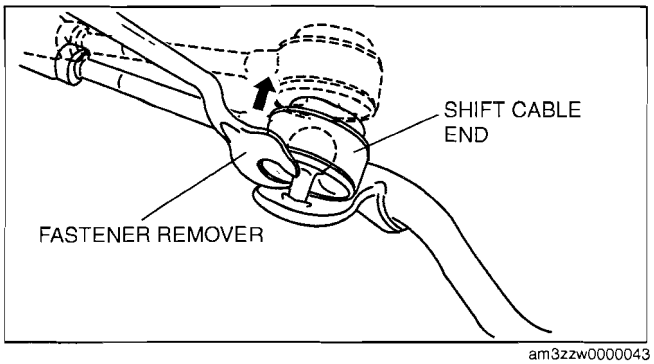
am3zzw0000299

1	Shift lever knob
2	Boot panel
3	Nuts
4	Nut
5	Bracket
6	Seal plate

7	Main shift cable (See 05-16-2 Main Shift Cable and Main Select Cable Removal Note.)
8	Main select cable (See 05-16-2 Main Shift Cable and Main Select Cable Removal Note.) (See 05-16-2 Select Cable Installation Note.)
9	Bolts
10	Sift lever component

Main Shift Cable and Main Select Cable Removal Note

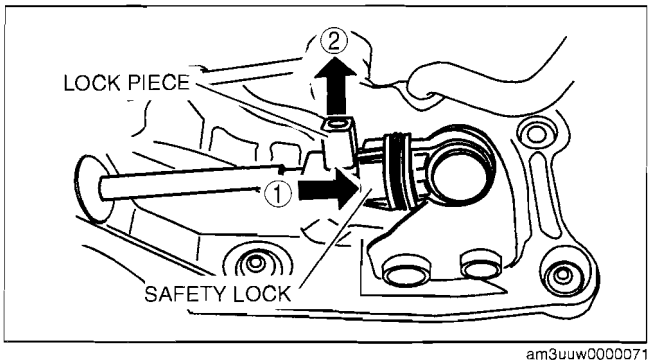
1. Remove the both shift cable end and select cable end using a fastener remover.



am3zzw0000043

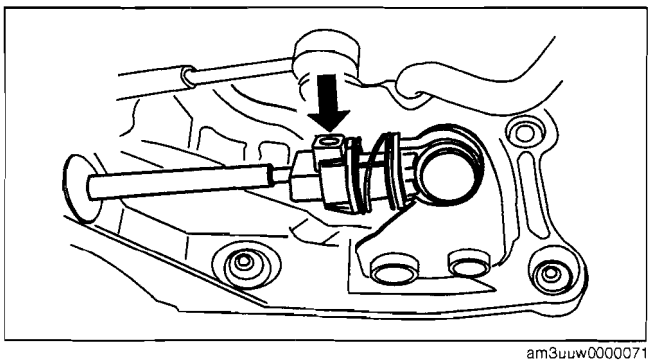
Select Cable Installation Note

1. Make sure that the shift lever (transaxle side) is in neutral.
2. Push the safety lock, then unlock the lock piece of the select cable in the order shown in the figure.
3. Shift the sift lever to neutral.



am3uuw0000071

4. Lock the lock piece of the selector cable in the figure.
5. Shift the shift lever from neutral to other position, and make sure that there are no other components in that area to interfere with the lever.



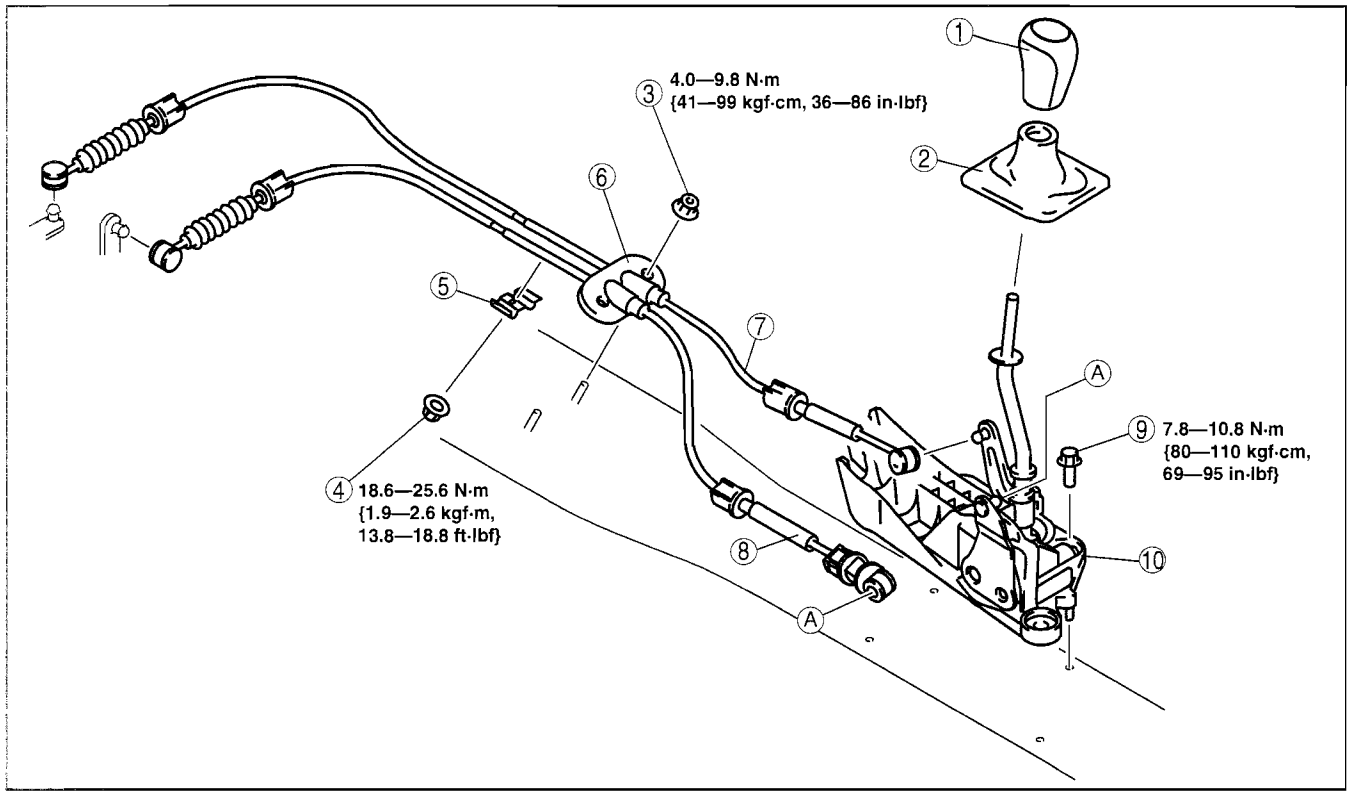
am3uuw0000071

SHIFT MECHANISM REMOVAL/INSTALLATION[A26M-R]

id0516008000c5

1. Remove the following parts:
   (1) Battery and battery tray
   (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)
   (2) Air cleaner component
   (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   (3) Console
   (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
2. When replacing the main shift cable and main select cable, perform the following procedure:
   (1) Remove the dashboard
   (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
   (2) Remove the A/C unit
   (See 07-11-3 A/C UNIT REMOVAL/INSTALLATION.)
   (3) Remove the tunnel member
   (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   (4) Remove the member
   (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   (5) Remove the TWC
   (See 01-15B-2 EXHAUST SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
   (6) Remove the heat insulator (Front)
   (7) Remove the heat insulator (Center)

3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. After installation, verify that the shift lever can be shifted smoothly into each position.



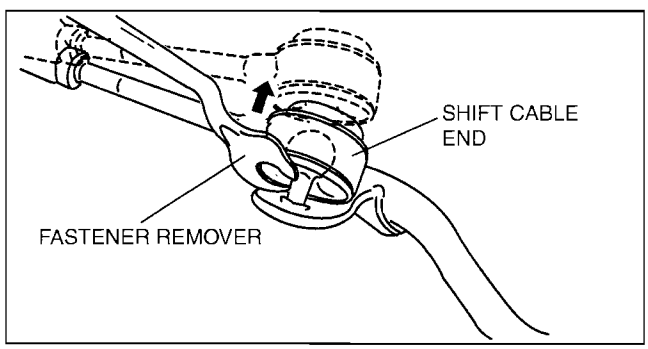
am3zzw0000310

1	Shift lever knob
2	Boot panel
3	Nuts
4	Nut
5	Bracket
6	Seal plate

7	Main shift cable (See 05-16-3 Main Shift Cable and Main Select Cable Removal Note.)
8	Main select cable (See 05-16-3 Main Shift Cable and Main Select Cable Removal Note.) (See 05-16-4 Select Cable Installation Note.)
9	Bolts
10	Sift lever component

Main Shift Cable and Main Select Cable Removal Note

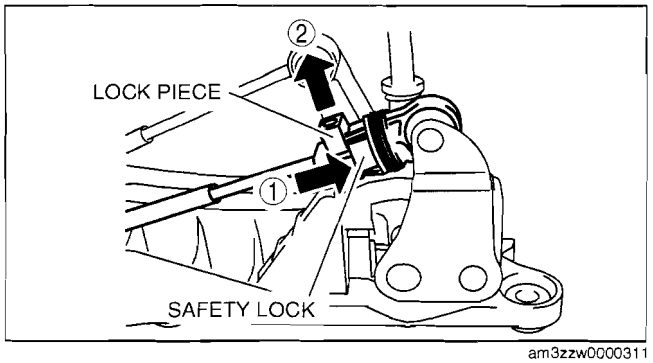
1. Remove the both shift cable end and select cable end using a fastener remover.



am3zzw0000043

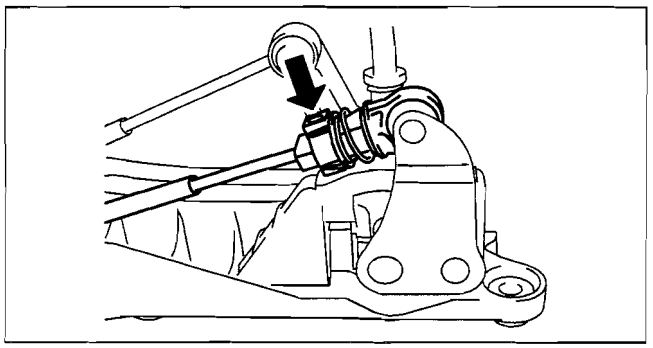
Select Cable Installation Note

1. Make sure that the shift lever (transaxle side) is in neutral.
2. Push the safety lock, then unlock the lock piece of the select cable in the order shown in the figure.
3. Shift the sift lever to neutral.



am3zzw0000311

4. Lock the lock piece of the selector cable in the figure.
5. Shift the shift lever from neutral to other position, and make sure that there are no other components in that area to interfere with the lever.

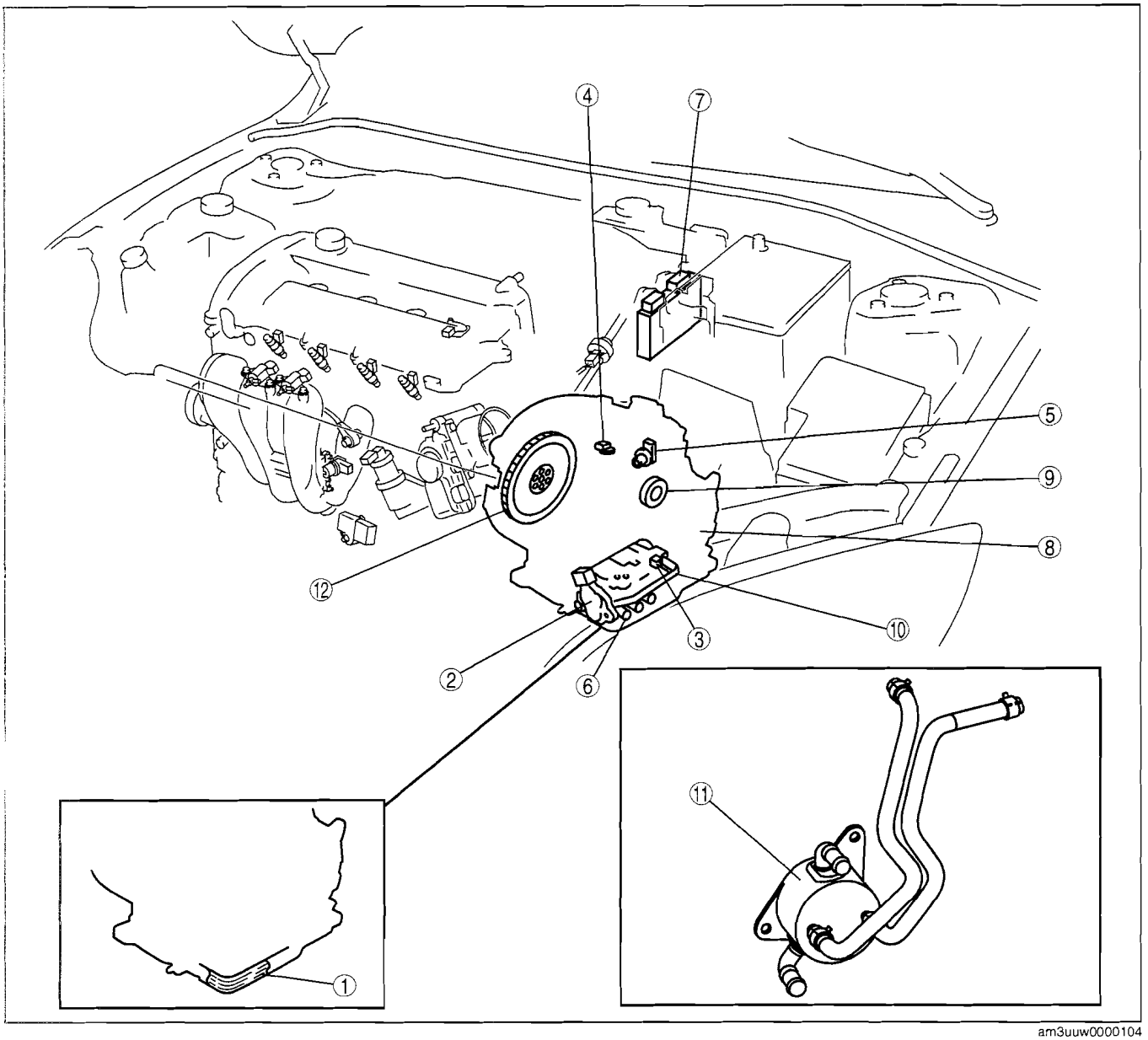


am3zzw0000311

05-17A AUTOMATIC TRANSAXLE [FN4A-EL]

AUTOMATIC TRANSAXLE LOCATION INDEX[FN4A-EL]

id0517a1802000



am3uuw0000104

1	Automatic transaxle fluid (ATF) (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].) (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
2	Transaxle range (TR) switch (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].) (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].) (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].)
3	Transaxle fluid temperature (TFT) sensor (See 05-17A-18 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL].) (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/ INSTALLATION[FN4A-EL].)
4	Input/turbine speed sensor (See 05-17A-20 INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL].) (See 05-17A-21 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL].)
5	Vehicle speed sensor (See 05-17A-21 VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL].) (See 05-17A-23 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FN4A-EL].)
6	Solenoid valve (See 05-17A-24 SOLENOID VALVE INSPECTION[FN4A-EL].) (See 05-17A-27 SOLENOID VALVE REMOVAL/ INSTALLATION[FN4A-EL].)
7	PCM (See 05-17A-27 PCM INSPECTION[FN4A-EL].) (See 05-17A-27 PCM REMOVAL/ INSTALLATION[FN4A-EL].)

8	Automatic transaxle (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
9	Oil seal (See 05-17A-36 OIL SEAL REPLACEMENT[FN4A-EL].)
10	Control valve body (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].) (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
11	Oil cooler (See 05-17A-39 OIL COOLER FLUSHING[FN4A-EL].) (See 05-17A-40 OIL COOLER REMOVAL/INSTALLATION[FN4A-EL].)
12	Drive plate (See 05-17A-42 DRIVE PLATE REMOVAL/INSTALLATION[FN4A-EL].)

MECHANICAL SYSTEM TEST[FN4A-EL]

id0517a1802100

Mechanical System Test Preparation

1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant level. (See 01-12A-2 COOLING SYSTEM SERVICE WARNINGS[LF, L3].) (See 01-12A-2 ENGINE COOLANT LEVEL INSPECTION[LF, L3].)
3. Inspect the engine oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
4. Inspect the ATF level. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
5. Inspect the idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
6. Inspect the ignition timing. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)

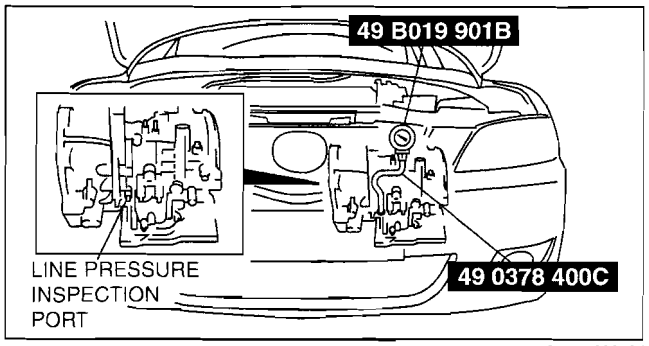
Line Pressure Test

1. Perform mechanical system test preparation. (See 05-17A-3 Mechanical System Test Preparation.)

Warning

- **Removing the square head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square head plug, allow the ATF to cool.**

2. Connect the **SSTs** (49 0378 400C) to the line pressure inspection port and replace the gauge of the **SST** (49 0378 400C) with the **SST** (49 B019 901B).
3. Start the engine and warm it up until the ATF reaches **60—70 °C {140—158 °F}**.
4. Shift the selector lever to the D range.
5. Read the line pressure while the engine is idling for the D range.
6. Read the line pressure while the engine is idling for the R position and M (1GR, 2GR) range in the same manner as in Steps 4—5.
7. Stop the engine, then replace the **SST** (49 B019 901B) with the gauge of the **SST** (49 0378 400C).
8. Start the engine.
9. Firmly depress the brake pedal with the left foot.
10. Shift the selector lever to the D range.



am3uuw0000004

Caution

- **If the accelerator pedal is pressed for more than 5 s while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 11 and 12 within 5 s.**

11. Gradually depress the accelerator pedal with the right foot.
12. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
13. Shift the selector lever to the N position and idle the engine for **1 min or more** to cool the ATF.

14. Read the line pressure at the engine stall speed for the M (1GR, 2GR) range and R position in the same manner as in Steps 9—13.

Line pressure specification

Position/range		Line pressure (kPa {kgf/cm^2, psi})
D, M (1GR, 2GR)	Idle	330—470 {3.4—4.7, 48—68}
	Stall	1,160—1,320 {11.8—13.4, 168—191}
R	Idle	490—710 {5.0—7.2, 72—102}
	Stall	1,680—2,020 {17.2—20.5, 244—292}

Warning

- **Removing the SST when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SST, allow the ATF to cool.**

15. Remove the **SSTs.**
16. Install a new square head plug in the inspection port.

Tightening torque
4.8—9.8 N·m {49—99 kgf·cm, 43—85 in·lbf}

Evaluation of line pressure test

Condition	Possible cause
Low pressure in all positions/ranges	• Worn oil pump • Oil leaking from oil pump, control valve body, and/or transaxle case • Pressure regulator valve stuck • Pressure control solenoid malfunction • Solenoid reducing valve stuck
Low pressure in D, M (1GR, 2GR) only	• Oil leaking from forward clutch hydraulic circuit
Low pressure in M (2GR) only	• Oil leaking from 2-4 brake band hydraulic circuit
Low pressure in M (1GR), R only	• Oil leaking from low and reverse brake hydraulic circuit
Low pressure in R only	• Oil leaking from reverse clutch hydraulic circuit
Higher pressure in all positions/ranges	• Pressure control solenoid malfunction and/or open harness • Pressure regulator valve stuck • TCM malfunction

Stall Test

1. Perform mechanical system test preparation. (See 05-17A-3 Mechanical System Test Preparation.)
2. Start the engine.
3. Firmly depress the brake pedal with the left foot.
4. Shift the selector lever to the D range.

Caution

- **If the accelerator pedal is depressed for more than 5 s while the brake pedal is depressed, the transaxle could be damaged. Therefore, perform Steps 5 and 6 within 5 s.**

5. Gently depress the accelerator pedal with the right foot.
6. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
7. Shift the selector lever to the N position and idle the engine for **1 min or more** to cool the ATF.
8. Perform a stall test of the M range and R position in the same manner as in Steps 3—7.
9. Turn off the engine.

Engine stall speed

Position/range	Engine stall speed (rpm)
D, M (1GR, 2GR)	2,200—2,800
R	

Evaluation of stall test

Condition		Possible cause
Above specification	Insufficient line pressure, torque converter pressure	• Worn oil pump
		• Oil leaking from oil pump, control valve, and/or transaxle case
		• Pressure regulator valve sticking
		• Converter relief valve sticking
		• Pressure control solenoid malfunction
	In D, M (1GR, 2GR) ranges	• Forward clutch slipping
	In M (2GR) range	• 2-4 brake band slipping
	In M (1GR) range and R position	• Low and reverse brake slipping
	In R position	• Low and reverse brake slipping • Reverse clutch slipping • Perform road test to determine whether problem is in low and reverse brake or reverse clutch • Engine braking felt in M (1GR) range: Reverse clutch is defective. • Engine braking not felt in M (1GR) range: Low and reverse brake is defective.
Below specification		• Engine lack of power

Time Lag Test

1. Perform mechanical system test preparation. (See 05-17A-3 Mechanical System Test Preparation.)
2. Start the engine.
3. Warm up the engine until the ATF temperature reaches **60—70 °C {140—158 °F}**.
4. Shift the selector lever from the N position to D range.
5. Use a stopwatch to measure the time it takes from shifting until shock is felt. Take three measurements for each test and average from the results using the following formula.

   Formula
   Average time lag = (Time 1 + Time 2 + Time 3) / 3

6. Perform the test for the following shifts in the same manner as in Step 5.
   - N position → R position

   Average time lag
   N position→D range: 0.4—0.7 s
   N position→R position: 0.4—0.7 s

Evaluation of time lag test

Condition		Possible cause
N→D shift	More than specification	• Low line pressure • Forward clutch slipping • Oil leaking from forward clutch fluid circuit • Shift solenoid A not operating properly
	Less than specification	• Forward accumulator not operating properly • Shift solenoid A not operating properly • Excessive line pressure
N→R shift	More than specification	• Low line pressure • Low and reverse brake slipping • Reverse clutch slipping • Shift solenoid B not operating properly
	Less than specification	• Servo apply accumulator not operating properly • Shift solenoid B not operating properly • Excessive line pressure

ROAD TEST[FN4A-EL]

id0517a1802200

Warning

- **When performing a road test, be aware of other vehicles, people, impediments to avoid an accident.**

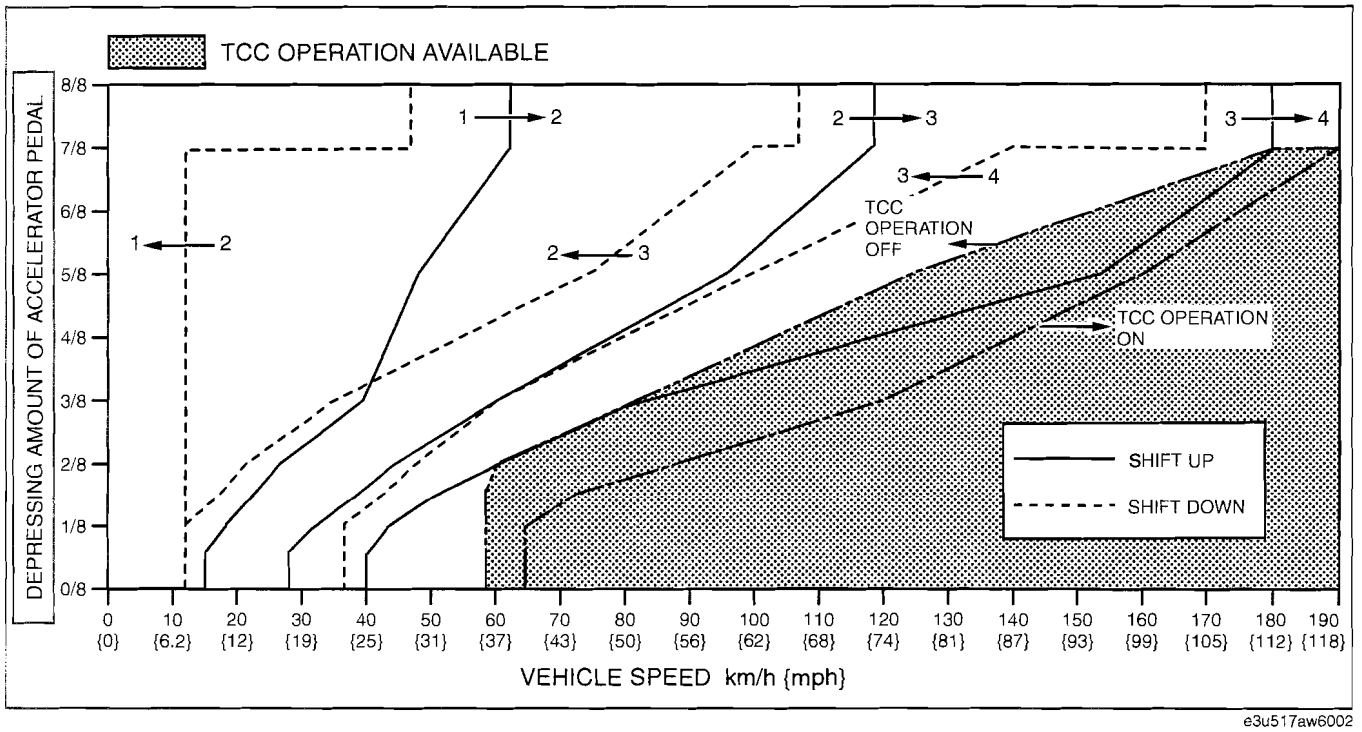
Note

- When the legal speed limit must be exceeded, use a chassis dynamometer instead of performing a road test.

Road Test Preparation

1. Inspect the engine coolant level. (See 01-12A-2 COOLING SYSTEM SERVICE WARNINGS[LF, L3].) (See 01-12A-2 ENGINE COOLANT LEVEL INSPECTION[LF, L3].)
2. Inspect the engine oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
3. Inspect the ATF level. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
4. Inspect the idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
5. Inspect the ignition timing. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
6. Bring up the engine and transaxle to normal operating temperature.

Shift Diagram
D range (normal mode)



e3u517aw6002

D Range Test

1. Perform road test preparation. (See 05-17A-6 Road Test Preparation.)
2. Shift the selector lever to D range.
3. Accelerate with the depressing amount of accelerator pedal half and then fully depress.
4. Verify that 1→2, 2→3, and 3→4 upshifts and downshifts are obtained. The shift points must be as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
5. Drive the vehicle in 4GR, 3GR, and 2GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshifts, and that the shift points are as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
6. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR and 4GR.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)

7. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)

Vehicle speed at shift point table

Range	Mode	Depressing amount of accelerator pedal condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	Fully depress	$D_1 \rightarrow D_2$	60—66 {38—40}	5,450—5,950
			$D_2 \rightarrow D_3$	117—125 {73—77}	5,650—5,950
			$D_3 \rightarrow D_4$	177—187 {110—115}	5,700—5,950
		Half depress	$D_1 \rightarrow D_2$	40—47 {25—29}	3,600—4,250
			$D_2 \rightarrow D_3$	68—88 {43—54}	3,250—4,200
			$D_3 \rightarrow D_4$	100—135 {62—83}	3,200—4,350
			TCC ON (D_4)	126—154 {79—95}	2,950—3.550
		Released	$D_4 \rightarrow D_3$	33—39 {21—24}	800—900
			$D_3 \rightarrow D_1$	9—15 {6—9}	300—450
		Kickdown	$D_4 \rightarrow D_3$	165—175 {103—108}	3,850—4,050
			$D_3 \rightarrow D_2$	103—111 {64—68}	3,300—3,550
			$D_2 \rightarrow D_1$	44—50 {28—31}	2,150—2,350
	POWER	Fully depress	$D_1 \rightarrow D_2$	60—66 {38—40}	5,450—5,950
			$D_2 \rightarrow D_3$	117—125 {73—77}	5,650—5,950
			$D_3 \rightarrow D_4$	177—187 {110—115}	5,700—5,950
		Half depress	$D_1 \rightarrow D_2$	42—50 {27—31}	3,800—4,500
			$D_2 \rightarrow D_3$	87—108 {54—66}	4,150—5,200
			$D_3 \rightarrow D_4$	130—159 {81—98}	4,150—5,100
		Released	$D_4 \rightarrow D_3$	40—46 {25—28}	950—1,050
			$D_3 \rightarrow D_1$	9—15 {6—9}	300—450
		Kickdown	$D_4 \rightarrow D_3$	165—175 {103—108}	3,850—4,050
			$D_3 \rightarrow D_2$	103—111 {64—68}	3.350—3,550
			$D_2 \rightarrow D_1$	44—50 {28—31}	2,150—2,350

M Range Test

1. Perform road test preparation. (See 05-17A-6 Road Test Preparation.)
2. Shift the selector lever to M range.
3. Verify that 1→2, 2→3, and 3→4 upshifts and 4→3, 3→2, and 2→1 downshifts are obtained by manual shifting of the selector lever forward and back.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
4. Decelerate the vehicle and verify that 4→3, 3→1 downshifts are obtained. The shift points must be as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
5. Decelerate the vehicle and verify that engine braking effect is felt in all gears.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
6. Drive the vehicle and verify that TCC operation is obtained in 4GR. The operation points must be as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)
7. Drive the vehicle in 4GR and 3GR and verify that kickdown occurs for 4→3, 3→2 downshifts, and that the shift points are as shown in the table below.
   - If there is any malfunction, inspect the PCM and ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)

Vehicle speed at shift point table

Range	Mode	Depressing amount of accelerator pedal condition	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
M	Manual	Half depress	TCC ON (M_4)	126—154 {79—95}	2,950—3,550
		All round	$M_4 \rightarrow M_3$	33—39 {21—24}	800—900
			$M_3 \rightarrow M_1$	9—15 {6—9}	300—450
		Kickdown	$M_4 \rightarrow M_3$	165—175 {103—108}	3,850—4,050
			$M_3 \rightarrow M_2$	68—76 {43—47}	2,200—2,400

P Position Test

1. Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.
   - If there is any malfunction, inspect the ATX. (See 05-03A-7 SYMPTOM TROUBLESHOOTING ITEM TABLE[FN4A-EL].)

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL]

id0517a1800500

Automatic Transaxle Fluid (ATF) Condition Inspection

1. Inspect the ATF for the following to determine whether the transaxle should be disassembled.
   - The ATF is muddy.
   - The ATF smells strange or unusual.

ATF Condition

Condition			Possible cause
Clear dark red		Normal	—
Light red (pink)		Contaminated with water	• Damaged oil cooler • Poor filler tube installation: Problem could occur to parts inside the transaxle by water contamination. It is necessary to overhaul the transaxle and detect defected parts. If necessary, replace the transaxle.
Reddish brown	Has burnt smell and metal particles are found	Deteriorated ATF	Defective powertrain components inside the transaxle: Particles cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler. • When large amount of metal particles are found, overhaul the transaxle and inspect for defective parts. If necessary, replace the transaxle. • Implement flushing operation as there is a possibility to have particles plugging up the oil pipe or oil cooler.
	Has no burnt smell	Normal	• Discoloration by oxidation

Automatic Transaxle Fluid (ATF) Level Inspection

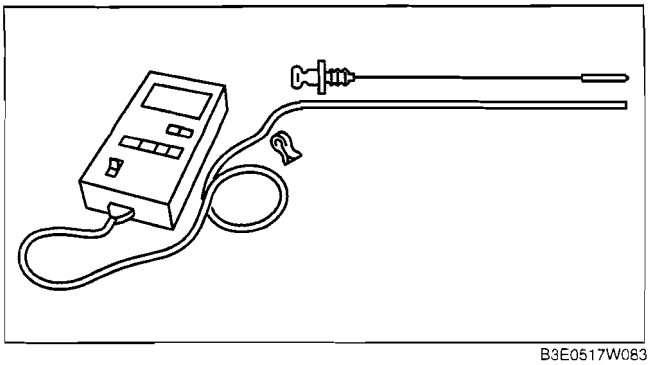
Caution

- **The ATF amount varies according to ATF temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature then adjust the ATF amount to the specified level according to the specified temperature.**

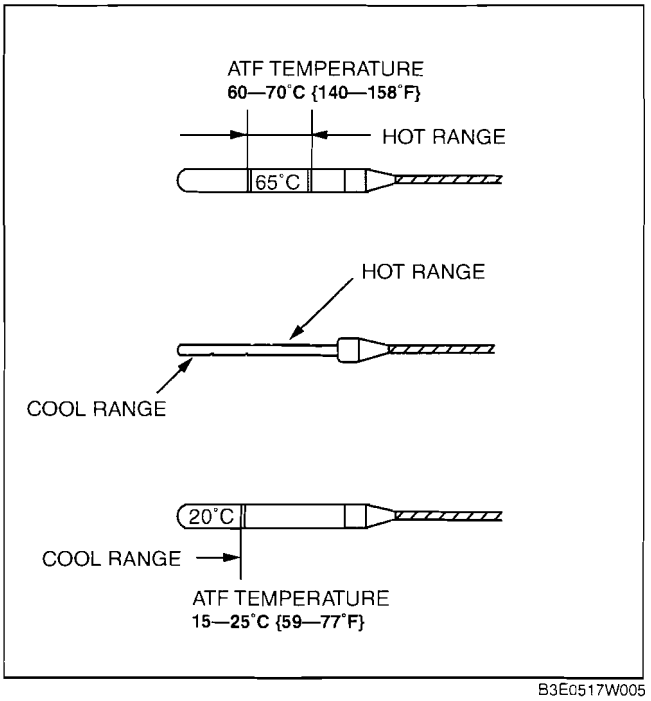
1. Place the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.

3. Adjust the length or thermometer probe so that the length is the same as the depth gauge, and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
   - If necessary, inspect the ATF before warming up the engine. In this case, use the cool range **(15—25 °C {59—77 °F})**.
4. Warm up the engine until the ATF reaches **60—70 °C {140—158 °F}**.
5. Shift the selector lever and pause momentarily in each range (P—D) while depressing the brake pedal.
6. Shift the selector lever to P position.
7. Verify that the ATF level is in the HOT range **(65 °C {149 °F})** while the engine is idling.
   - If necessary, add ATF to the specification.

ATF type
ATF M-V



B3E0517W083



B3E0517W005

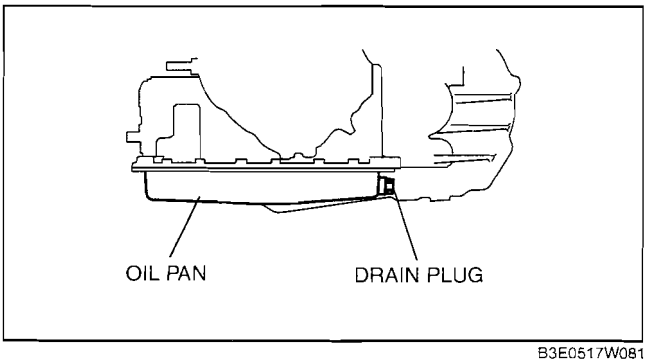
AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL]

id0517a1800600

Warning
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.**

1. Remove the oil dipstick.
2. Remove the oil drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and the drain plug.

Tightening torque
29.4—41.2 N·m
{3.0—4.2 kgf·m, 21.7—30.3 ft·lbf}



B3E0517W081

5. Add the specified ATF until ATF level reaches lower notch of dipstick type of ATF through the oil filler tube.

ATF type
ATF M-V

Capacity (Approx. quantity)
7.2 L {7.6 US qt, 6.3 Imp qt}

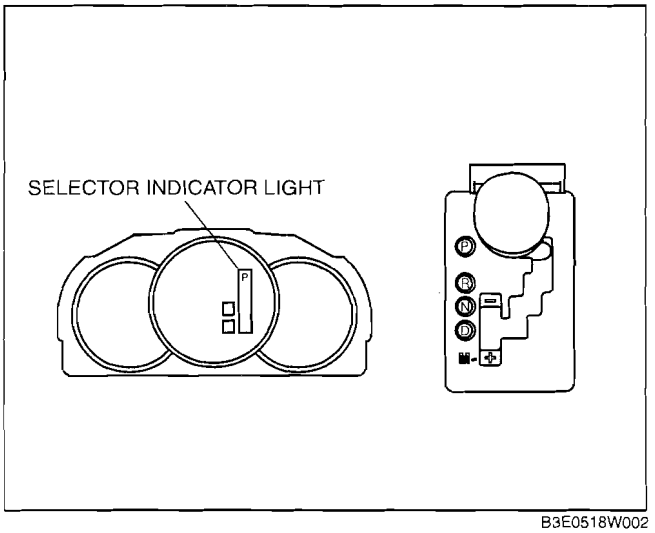
6. Ensure that the ATF level is in the HOT range **(65 °C {149 °F})**.
   - Add ATF to the specified level as necessary.

TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL]

id0517a1800900

Operating Inspection

1. Verify that the starter operates only when the ignition switch is turned to the START position with the selector lever in P or N position.
   - If there is any malfunction, adjust the TR switch.
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
   - If there is any malfunction, adjust the TR switch.
3. Verify that the positions of the selector lever and the indicator are aligned.
   - If there is any malfunction, adjust the TR switch.



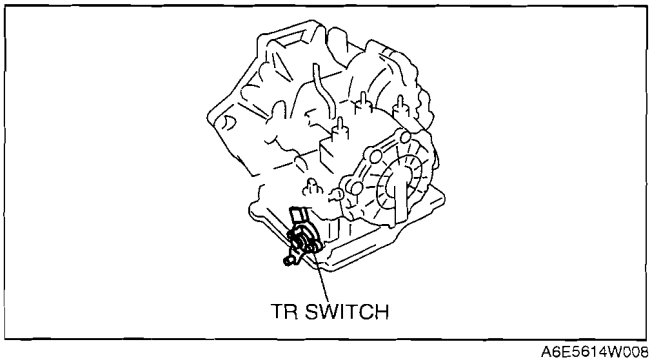
B3E0518W002

Continuity Inspection

Caution

- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the TR switch connector.



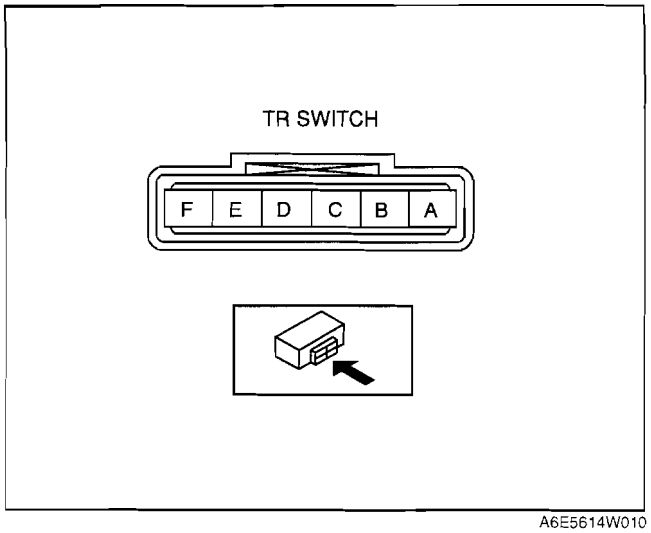
A6E5614W008

5. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, adjust the TR switch and go to Step 5.

O—O : Continuity

Position/Range	Connector terminal			
	A	F	D	E
P	O—O			
R			O—O	
N	O—O			
D				

B3E0517W006



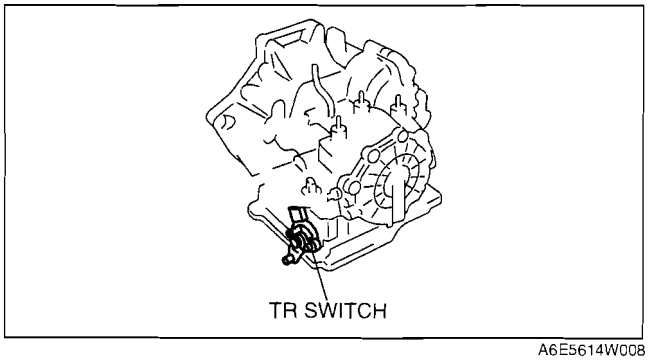
A6E5614W010

6. Reinspect for continuity at TR switch.
   - If there is any malfunction, replace the TR switch. (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].)
7. Connect the TR switch connector.
8. Install the under cover.
9. Connect the negative battery cable.
10. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Resistance Inspection (On-Vehicle Inspection)

Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

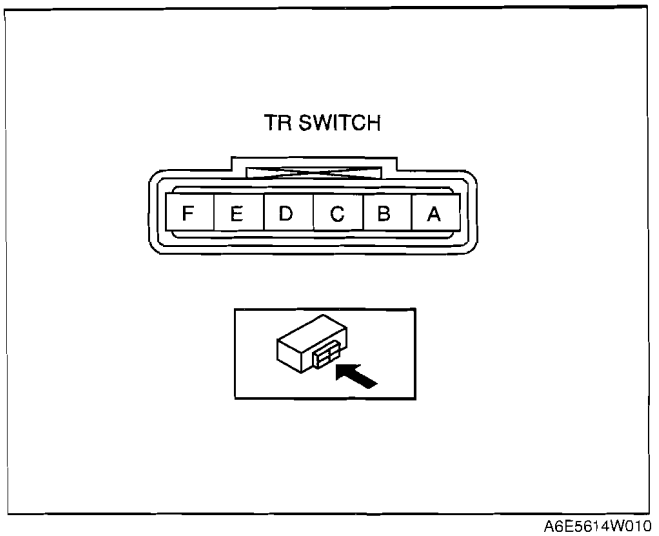
1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the TR switch connector.



A6E5614W008

5. Measure the resistance between the following terminals.
   - If there is any malfunction, inspect the ground, then perform the operating inspection.

Terminal	Position/Range	Resistance (ohm)
B—C	P	4,085—4,515
	R	1,425—1,575
	N	713—788
	D	371—409



A6E5614W010

6. Connect the TR switch connector.
7. Install the under cover.
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL]

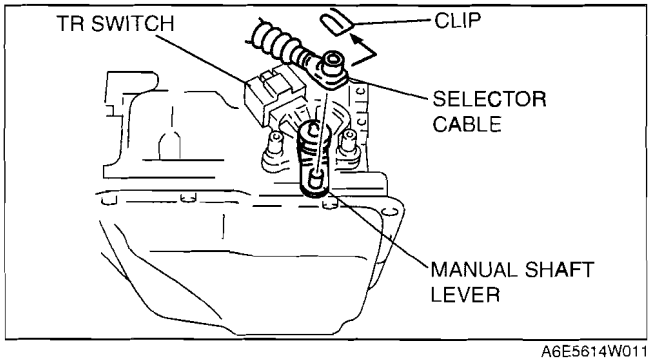
id0517a1804000

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.

Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

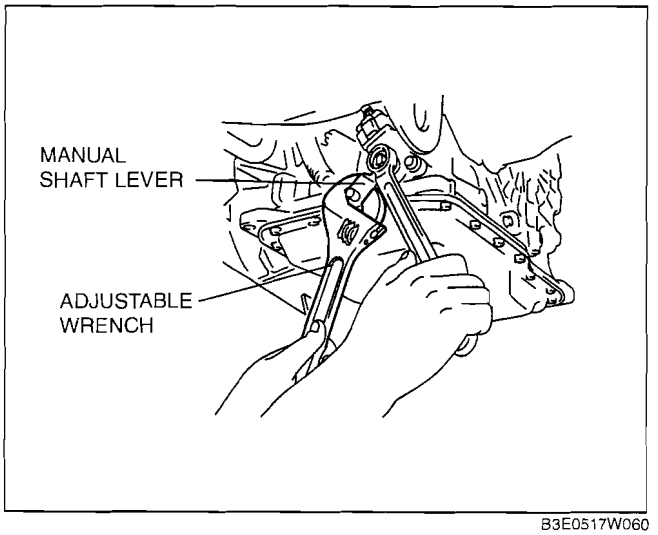
4. Disconnect the TR switch connector.
5. Remove the clip and disconnect the selector cable.

Caution
- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**



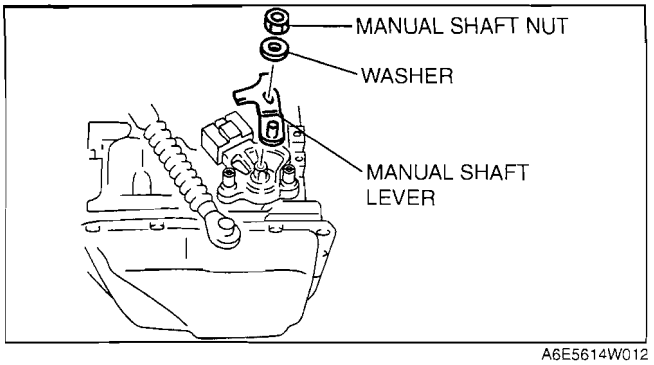
A6E5614W011

6. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.
7. Remove the manual shaft nut and washer.



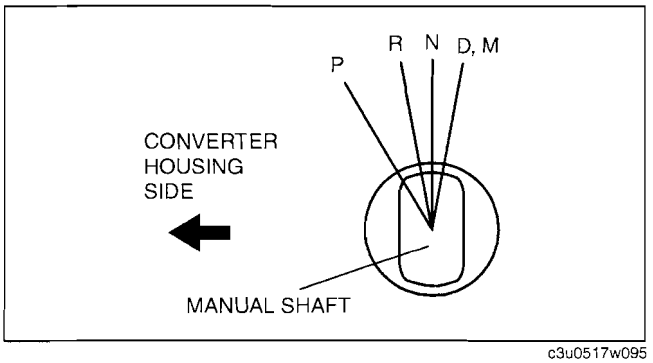
B3E0517W060

8. Remove the manual shaft lever.
9. Remove the TR switch.



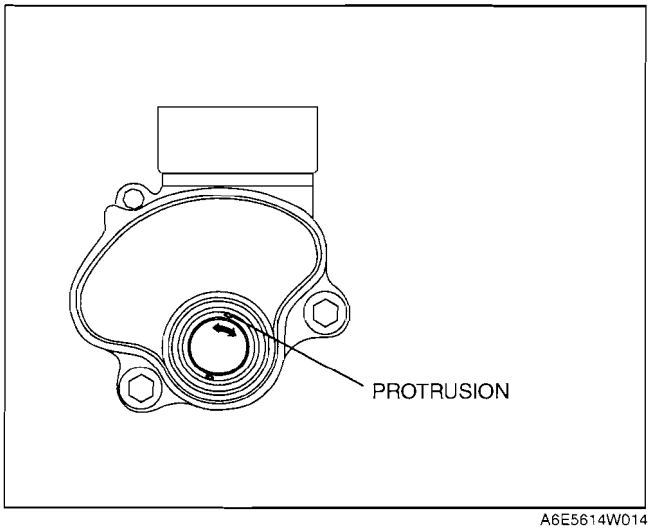
A6E5614W012

10. Rotate the manual shaft to the converter housing side fully, then return two notches to set the N position.

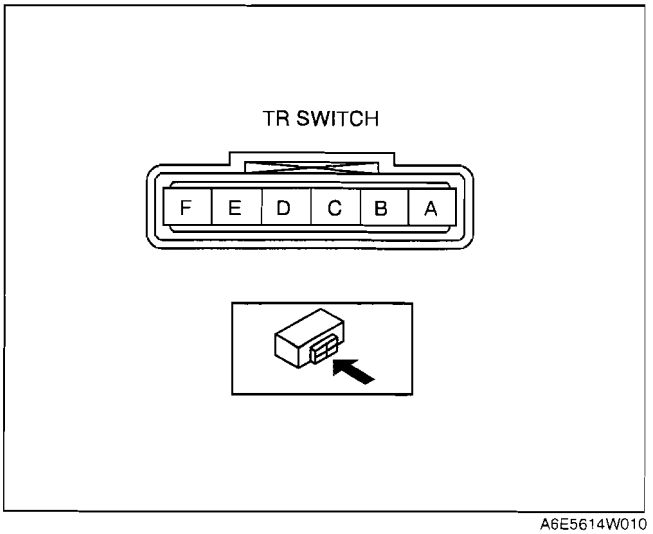


c3u0517w095

11. Turn the protrusion between the TR switch terminals B and C until the resistance becomes **750 ohms**.

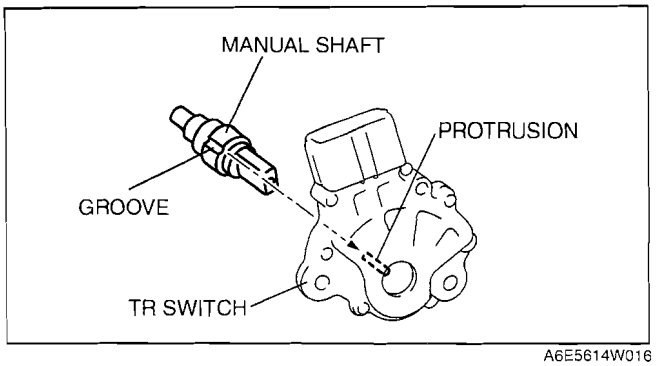


A6E5614W014



A6E5614W010

12. Install the TR switch while aligning the protrusion and groove as shown in the figure.
13. Hand-tighten the TR switch mounting bolts.



A6E5614W016

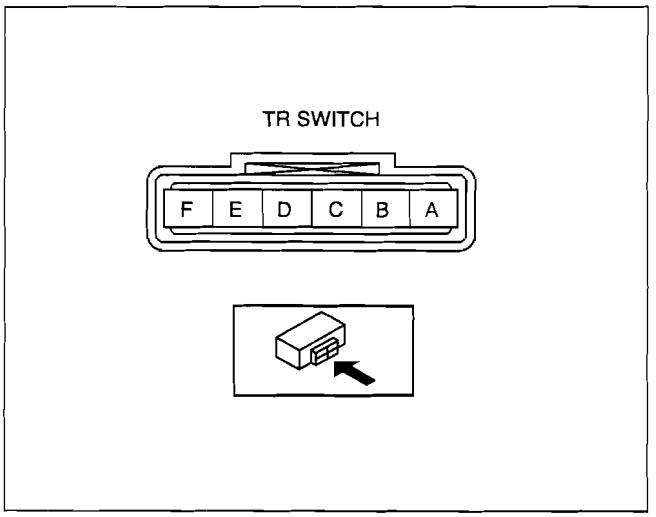
14. Inspect the resistance between the TR switch terminals B and C.
    - If there is any malfunction, readjust the TR switch. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].)

    Resistance
    750 ohms

15. Tighten the TR switch mounting bolts.

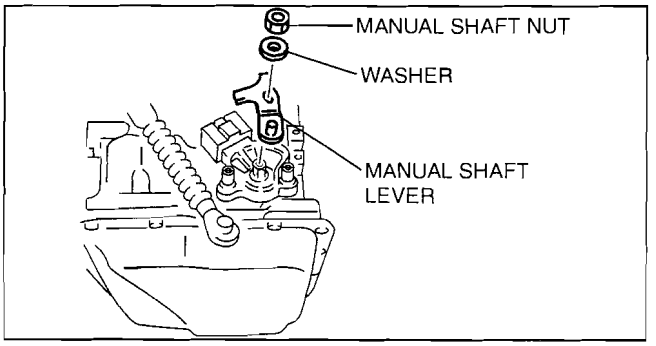
    Tightening torque
    8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

    Caution
    - **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**



A6E5614W010

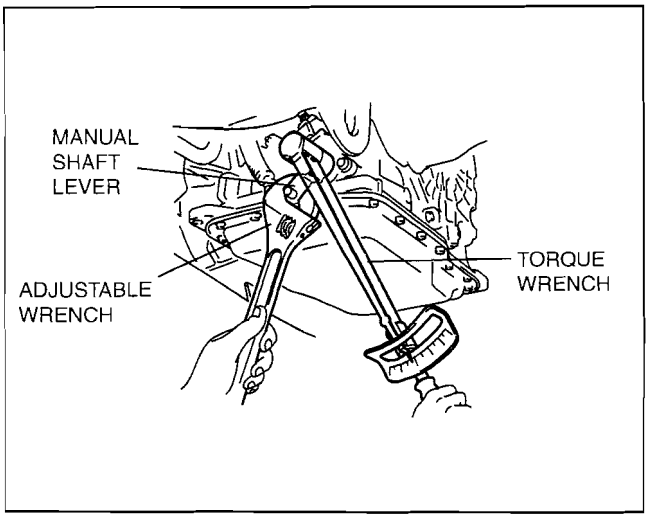
16. Install the manual shaft lever and the washer.



A6E5614W012

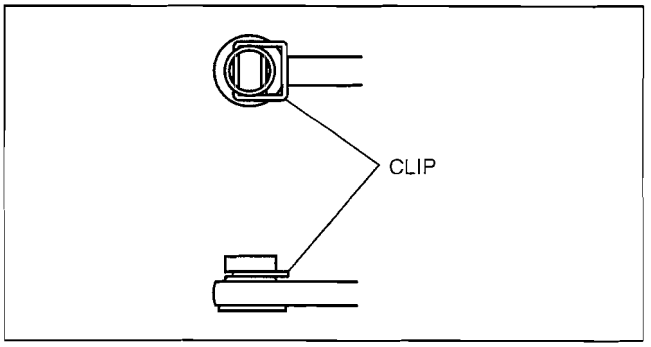
17. Set the adjustable wrench as shown in the figure to hold the manual shaft lever, and tighten the manual shaft nut.

    Tightening torque
    31.4—46.1 N·m
    {3.2—4.7 kgf·m, 23.2—33.9 ft·lbf}



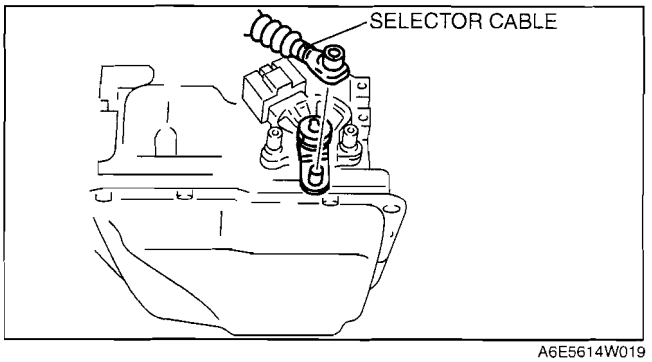
B3E0517W061

18. Install the clip to the selector cable as shown in the figure.
19. Shift the selector lever to P position.
20. Turn the manual shaft lever to P position.



B3E0517W091

21. Connect the selector cable.
22. Inspect for continuity at the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)
    - If there is any malfunction, readjust the TR switch. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].)
23. Connect the TR switch connector.
24. Install the under cover.
25. Connect the negative battery cable.
26. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



A6E5614W019

27. Inspect operation of the TR switch. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)
    - If there is any malfunction, readjust the TR switch. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].)

TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL]

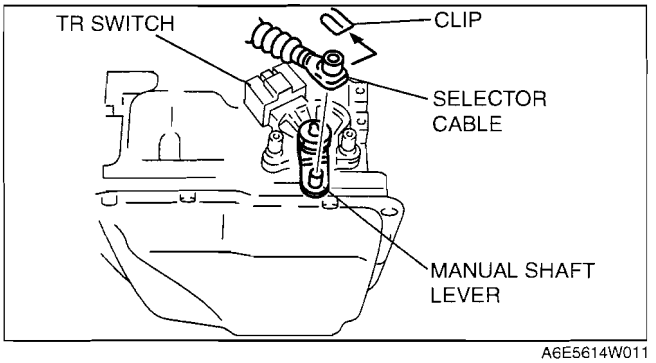
id0517a1803700

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.

Caution

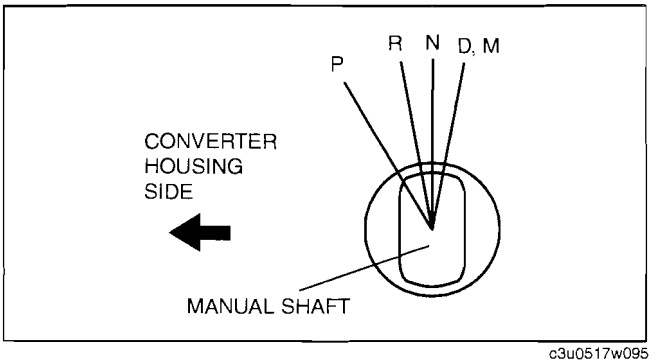
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

4. Remove the clip and disconnect the selector cable.



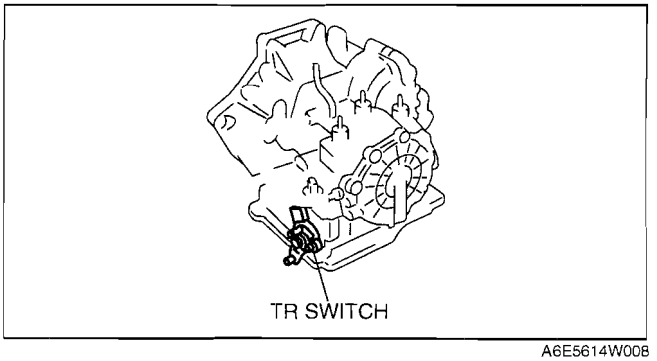
A6E5614W011

5. Rotate the manual shaft to the converter housing side fully, then return two notches to set the N position.



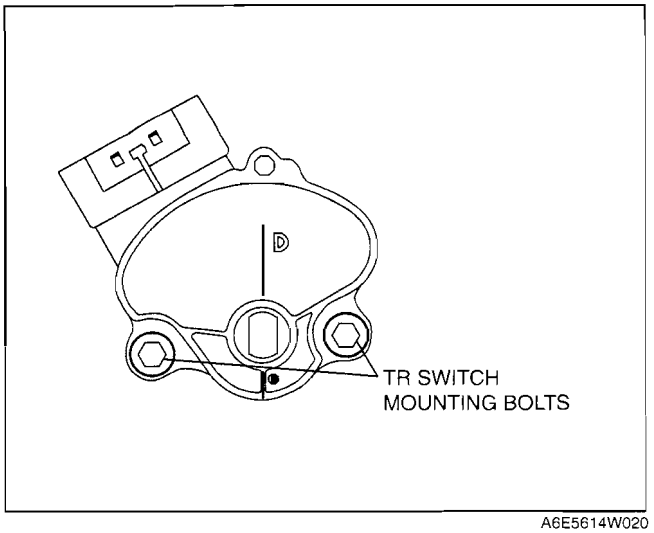
c3u0517w095

6. Disconnect the TR switch connector.



A6E5614W008

7. Loosen the TR switch mounting bolts.



A6E5614W020

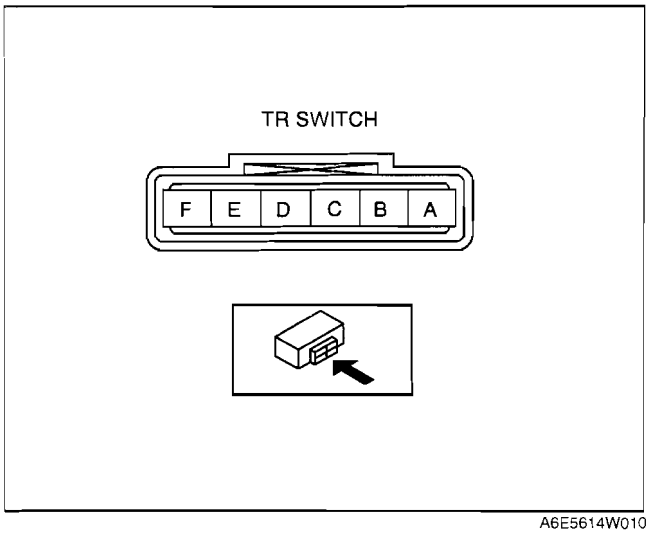
8. Measure the resistance between the TR switch terminals B and C.
9. Adjust the switch to the point as follows.

Resistance
750 ohms

10. Tighten the TR switch mounting bolts.

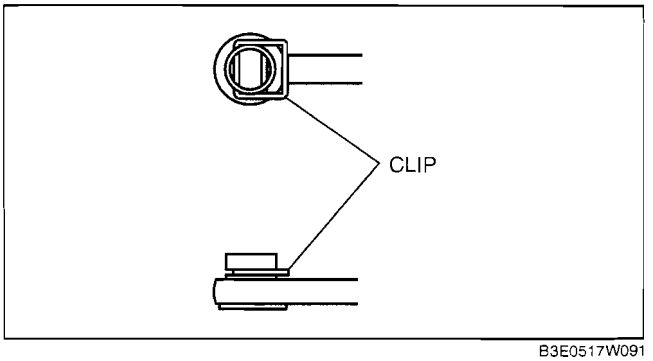
Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

11. Move the selector lever to N position.
12. Verify that the TR switch is aligned with N position.
13. Connect the TR switch connector.



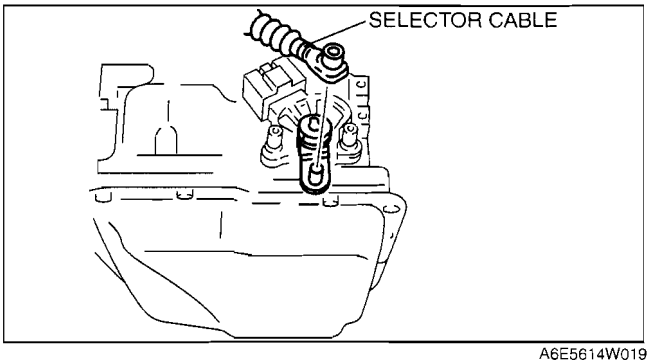
A6E5614W010

14. Install the clip to the selector cable as shown in the figure.



B3E0517W091

15. Connect the selector cable to the manual shaft lever as shown in the figure.
16. Inspect the TR switch operation. (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].)
    - If there is any malfunction, readjust the TR switch.
17. Install the under cover.
18. Connect the negative battery cable.
19. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



A6E5614W019

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FN4A-EL]

id0517a1801000

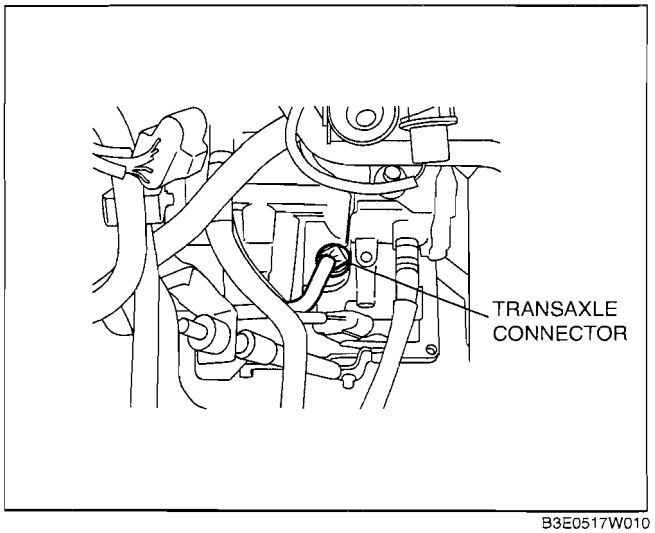
On-Vehicle Inspection

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.

Caution

- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

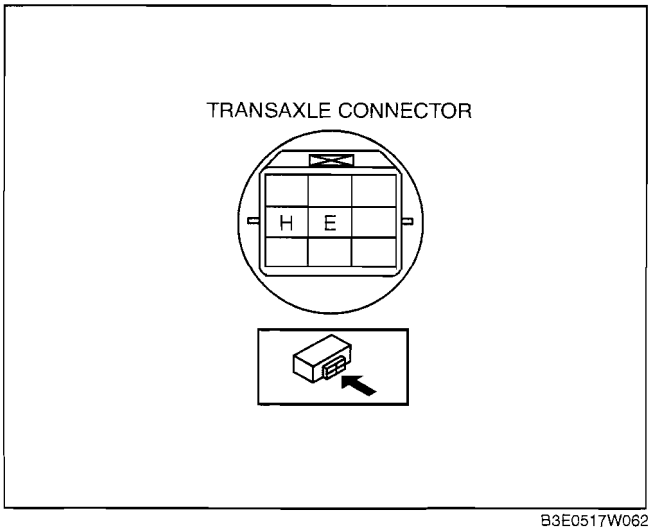
4. Disconnect the transaxle connector.



B3E0517W010

5. Measure the resistance between the transaxle connector terminals E and H.
   - If there is any malfunction, perform the off-vehicle inspection of TFT sensor. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL].)

ATF temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98



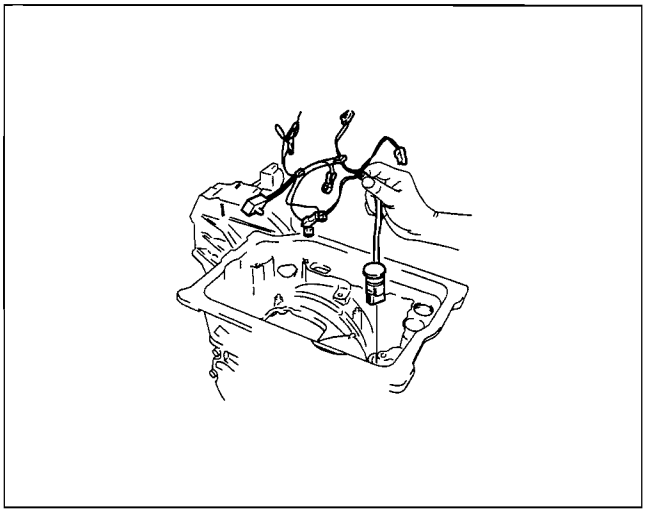
B3E0517W062

6. Install the under cover.
7. Connect the negative battery cable.
8. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Off-Vehicle Inspection

Warning
- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.**

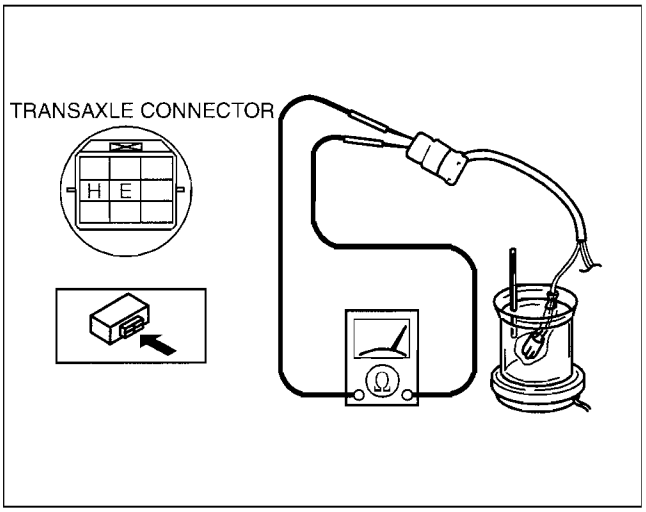
1. Remove the control valve body. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].)
2. Remove the coupler component.
3. Place the TFT sensor and a thermometer in ATF as shown in the figure, and heat the ATF gradually.



B3E0517W082

4. Measure the resistance between the terminals of the TFT sensor.
   - If there is any malfunction, replace the TFT sensor. (See 05-17A-20 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/ INSTALLATION[FN4A-EL].)

ATF temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98



B3E0517W064

5. Install the coupler component.
6. Install the control valve body. (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)

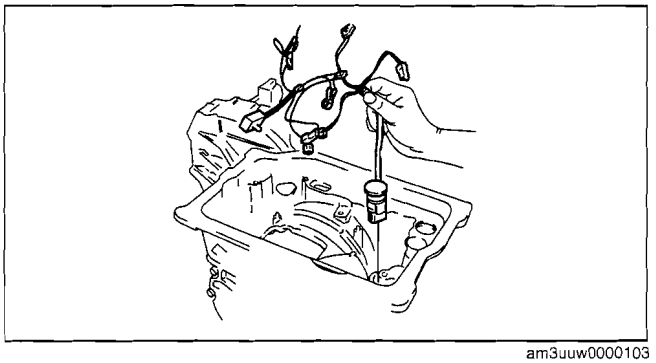
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FN4A-EL]

id0517a1801100

Warning

- **A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.**

1. Remove the oil pan. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].)
2. Remove the control valve body. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].)
3. Remove the coupler component.
4. Install a coupler component.
5. Install the control valve body. (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
6. Install the oil pan. (See 05-17A-37 CONTROL VALVE BODY INSTALLATION[FN4A-EL].)
7. Perform the mechanical system test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)



am3uuw0000103

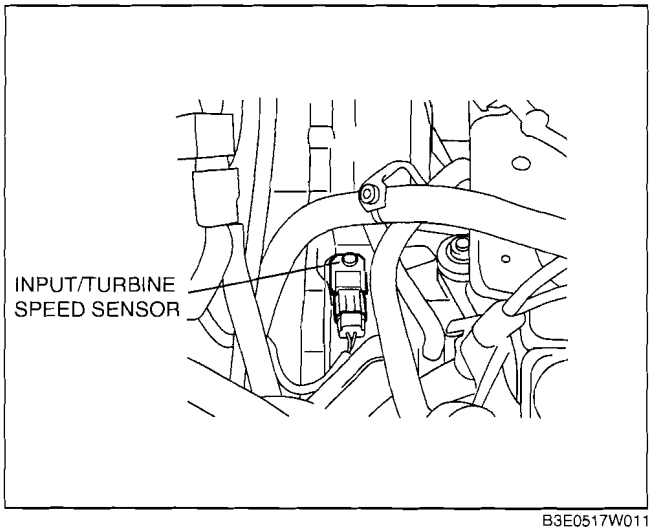
INPUT/TURBINE SPEED SENSOR INSPECTION[FN4A-EL]

id0517a1801200

Caution

- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the input/turbine speed sensor connector.

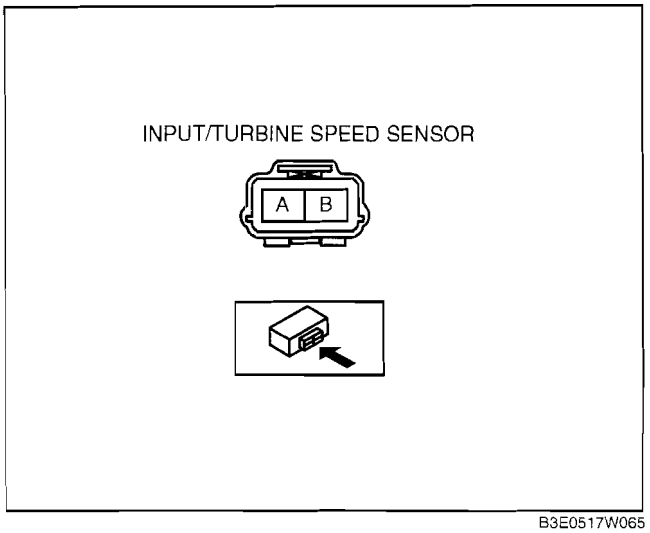


B3E0517W011

4. Measure the resistance between the input/turbine speed sensor terminals.
   - If there is any malfunction, replace the input/turbine speed sensor.

   Resistance
   250—600 ohms (ATF temperature: –40—160 °C {–40—320 °F})

5. Connect the input/turbine speed sensor connector.
6. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
7. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



B3E0517W065

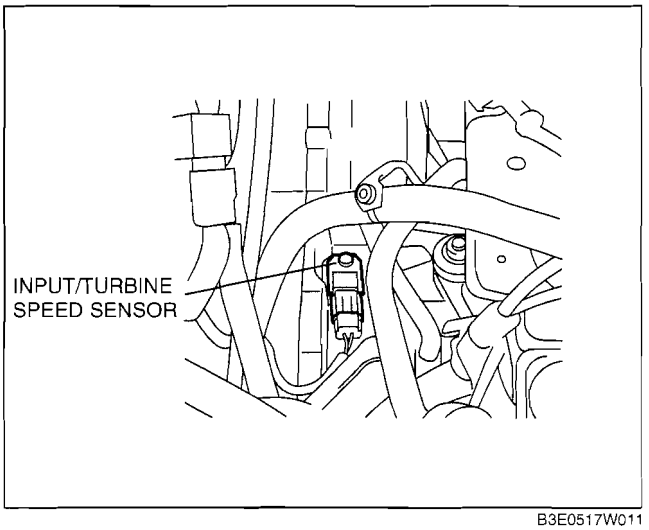
INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FN4A-EL]

id0517a1801300

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
3. Disconnect the input/turbine speed sensor connector.
4. Remove the input/turbine speed sensor.
5. Apply ATF to a new O-ring and install it on a new input/turbine speed sensor.
6. Install the input/turbine speed sensor.

   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

7. Connect the input/turbine speed sensor connector.
8. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



B3E0517W011

VEHICLE SPEED SENSOR (VSS) INSPECTION[FN4A-EL]

id0517a1801400

1. Connect the M-MDS, drive the vehicle, and verify the input value of the OSS PID.
   - If the input value is 0 rpm, perform the "Power Supply Voltage Inspection", "Open Circuit Inspection", or "Short Circuit Inspection".
   - If the input value is other than 0 rpm, perform the "Visual Inspection" or "Wave Profile Inspection".

Visual Inspection

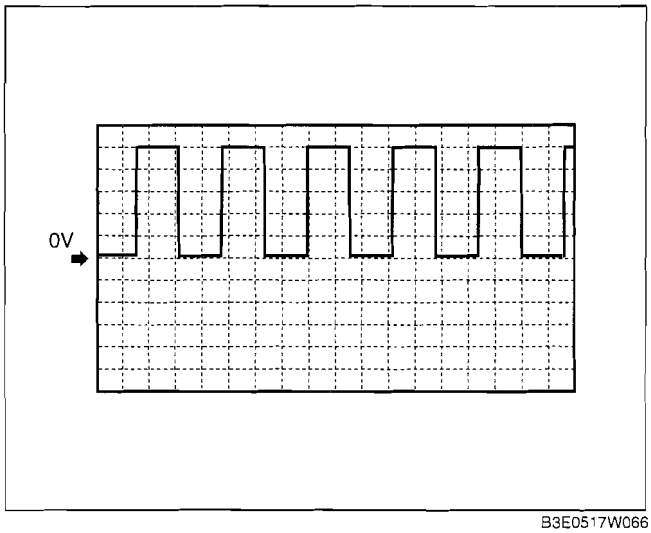
1. Remove the VSS. (See 05-17A-23 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FN4A-EL].)
2. Verify that the sensor is free of any metallic shavings or particles.
   - If there is any malfunction, clean them off.
3. Install the VSS. (See 05-17A-23 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FN4A-EL].)

Wave Profile Inspection

1. Remove the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)
2. Connect M-MDS to DLC-2.
3. Connect oscilloscope test leads to the following PCM connector terminals.
   - (+) lead: PCM terminal 1AW*1, 1J*2
   - (–) lead: PCM terminal 1BD
4. Start the engine.
5. Monitor VSS PID.
6. Inspect wave profile.
   - PCM terminal:1AW*1 (+)—1BD (–), 1J*2 (+)—1BD (–)
   - Oscilloscope setting: 1 V/DIV (Y), 2.5 ms/DIV (X), DC range
   - Vehicle condition: drive the vehicle at 32 km/h {20 mph}
     — If there is any malfunction, perform the "Open Circuit Inspection" or "Short Circuit Inspection".

*1 : California emission regulation applicable model

*2 : Except for California emission regulation applicable model

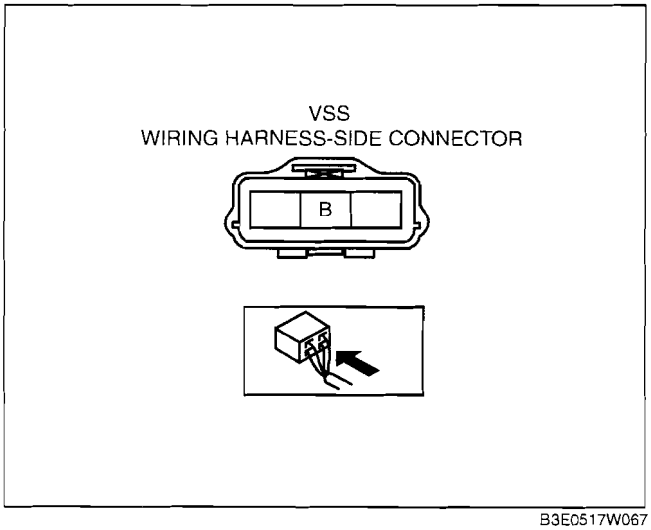


B3E0517W066

Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to the ON position.
3. Measure voltage at VSS terminal B.
   - If voltage is normal, go to Open Circuit Inspection and Short Circuit Inspection.
   - If there is any malfunction, repair wiring harness between VSS and PCM.

Specification
4.5—5.5 V



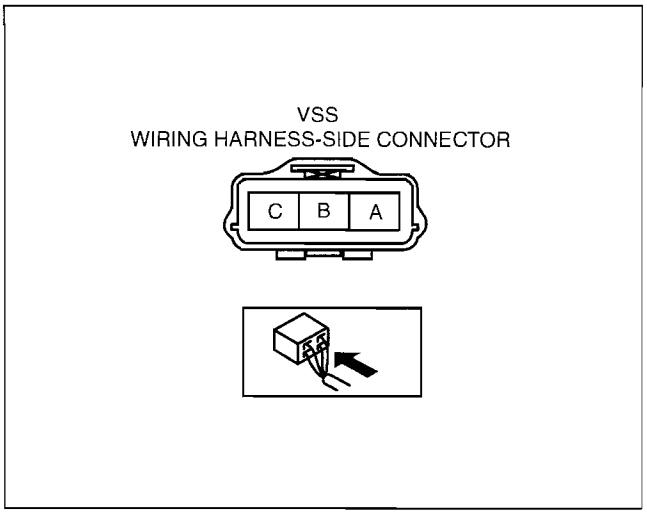
B3E0517W067

Open Circuit Inspection

1. Inspect the following circuit for open.
   - Power circuit (VSS terminal A to main relay terminal D)
   - Ground circuit (VSS terminal C to GND)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.

Short Circuit Inspection

1. Inspect the following circuit for short circuit.
   - Power circuit (VSS terminal A to main relay terminal D)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.



B3E0517W068

Sensor Rotor Inspection

1. Remove the VSS. (See 05-17A-23 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FN4A-EL].)
2. Shift the selector lever to N position.
3. Inspect sensor rotor surface via VSS installation hole while rotating the front tire manually.
   (1) Is the sensor rotor free of damage and cracks?
   (2) Is the sensor rotor free of any metallic shavings or particles?
   - If the sensor rotor is normal, replace the VSS.
   - If there is any malfunction, clean or replace the sensor rotor.

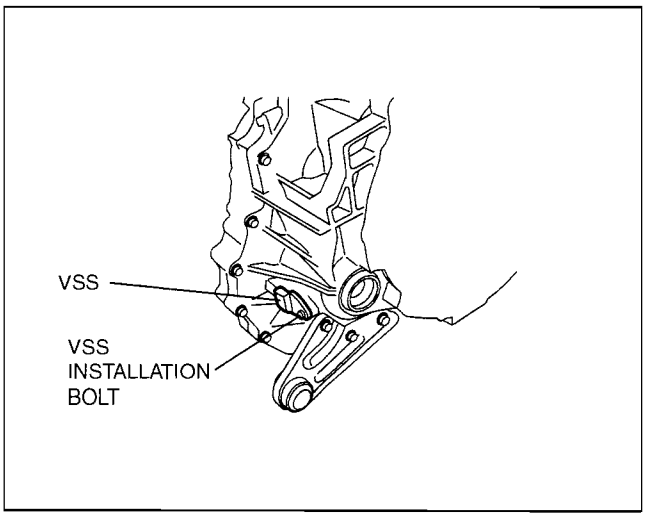
VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FN4A-EL]

id0517a1806100

Caution

- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**
- **If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the VSS connector.
5. Remove the VSS.
6. Apply ATF to a new O-ring and install it on a new VSS.

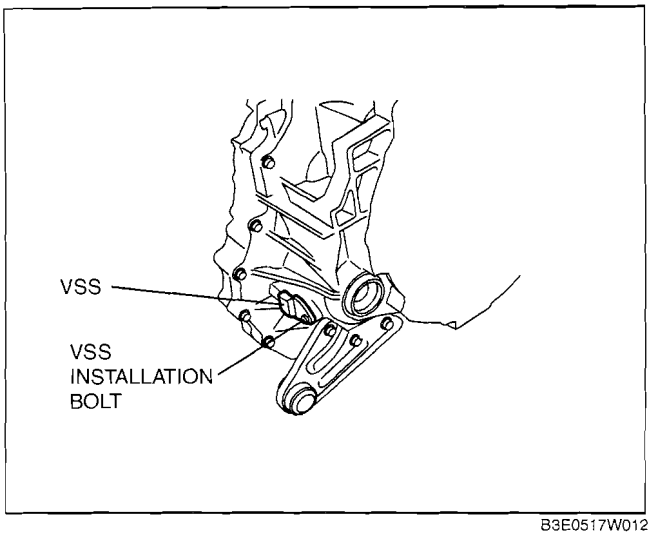


B3E0517W012

7. Install the VSS.

Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

8. Connect the VSS connector.
9. Install the under cover.
10. Connect the negative battery cable.
11. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



B3E0517W012

SOLENOID VALVE INSPECTION[FN4A-EL]

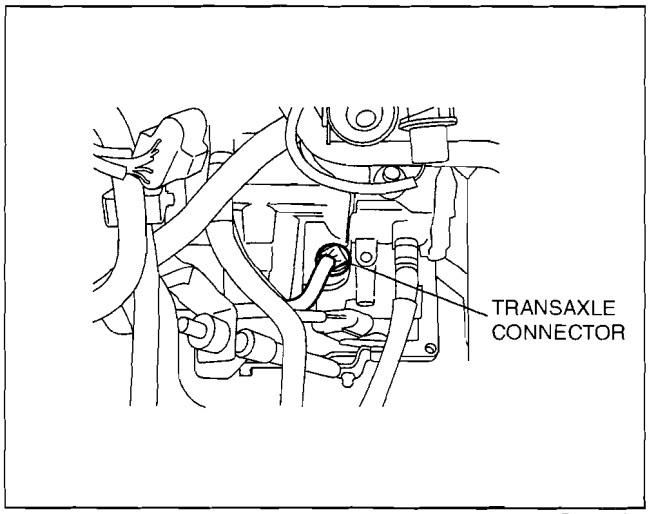
id0517a1801900

Resistance Inspection (On-Vehicle Inspection)

Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the transaxle connector.

Note
- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (terminal I) of the pressure control solenoid inside the solenoid valve connector.

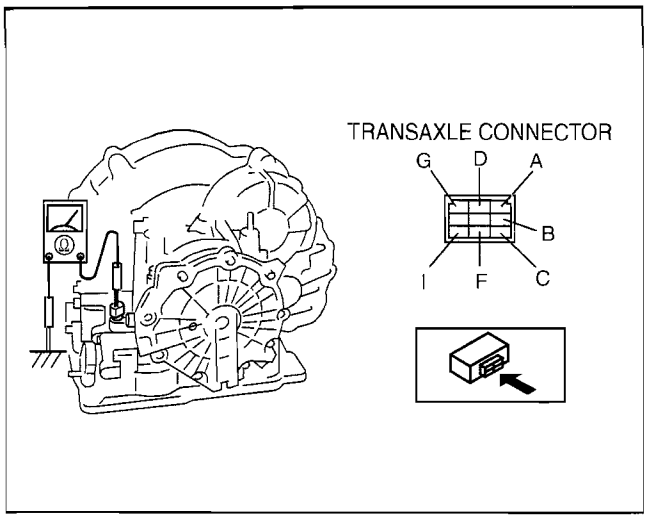


B3E0517W010

5. Measure the resistance between the following terminals.
   - If there is any malfunction, inspect the ground, then perform the operating inspection.

ATF temperature: –40—150 °C {–40—302 °F}

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Shift solenoid A	1.0—4.2
C—GND	Shift solenoid B	1.0—4.2
G—GND	Shift solenoid C	1.0—4.2
B—GND	Shift solenoid D	10.9—26.2
F—GND	Shift solenoid E	10.9—26.2
D—I	Pressure control	2.4—7.3



B3E0517W069

6. Connect the transaxle connector.
7. Install the under cover.
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Operating Inspection

1. Disconnect the transaxle connector.

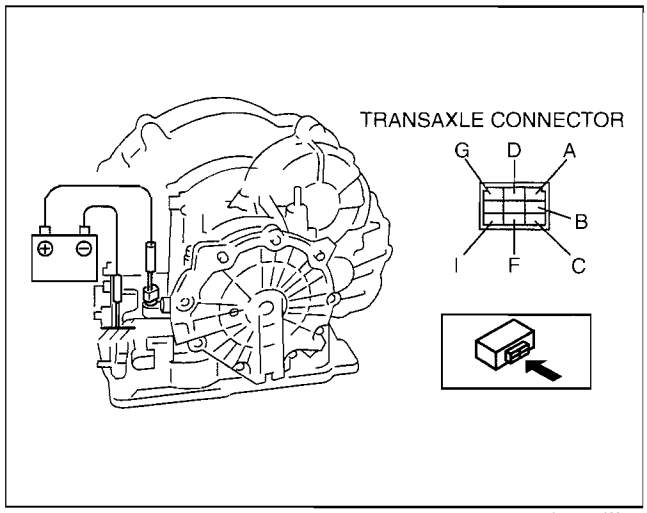
Caution

- **Do not apply battery position voltage to terminals A, B, C, D, F and G for more than 3 s.**

Note

- Because the operation sound of the valves is small, perform inspection in a quiet place.

2. Apply battery positive voltage to the transaxle connector terminals A, B, C, F or G and battery negative voltage to GND, and verify that operating sound is heard from the solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If the transaxle harness is normal, perform the resistance inspection (off-vehicle inspection).
     — If there is any malfunction, repair or replace the transaxle harness.
3. Apply battery positive voltage to the transaxle connector terminal D and battery negative voltage to the transaxle connector terminal I, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If transaxle harness is normal, perform the resistance inspection (off-vehicle inspection).
     — If there is any malfunction, repair or replace the transaxle harness.



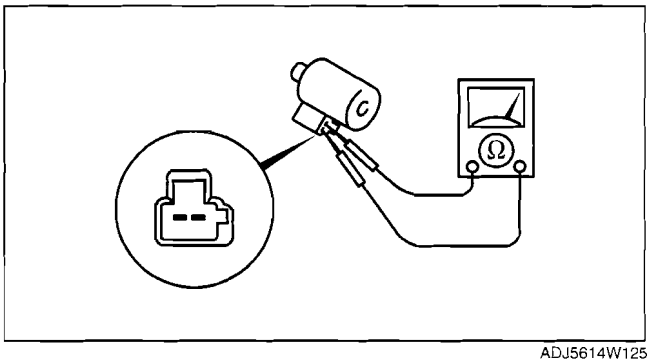
B3E0517W070

Resistance Inspection (Off-Vehicle Inspection)

1. Remove the control valve body. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)
2. Measure the resistance of each solenoid valve individually.
   - If there is any malfunction, replace the solenoid valve.
3. Install the control valve body. (See 05-17A-27 SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL].)

Pressure control solenoid

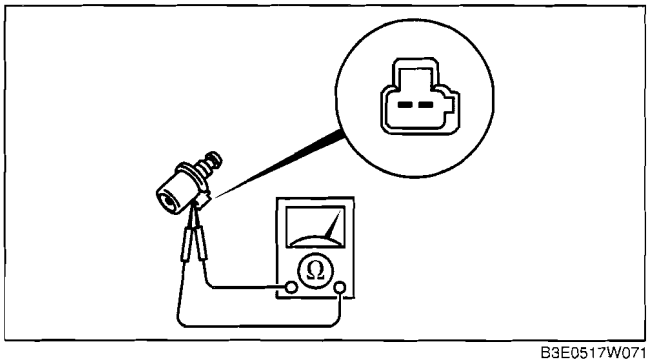
Resistance
2.4—7.3 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



ADJ5614W125

Shift solenoid A, B, C

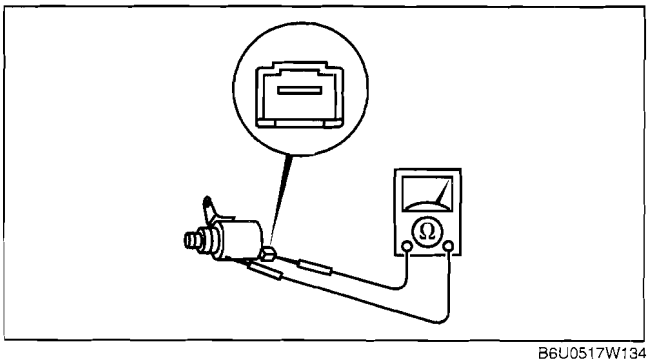
Resistance
1.0—4.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



B3E0517W071

Shift solenoid D, E

Resistance
10.9—26.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})

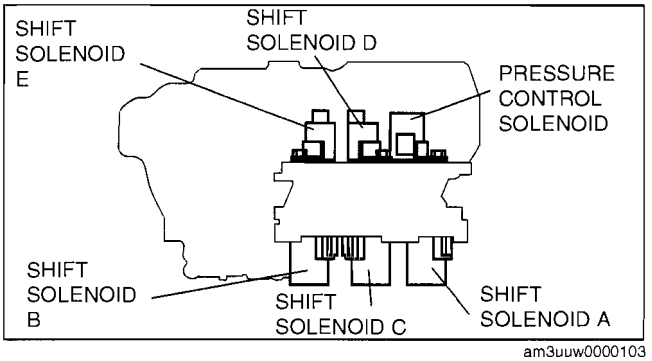


B6U0517W134

SOLENOID VALVE REMOVAL/INSTALLATION[FN4A-EL]

id0517a1804600

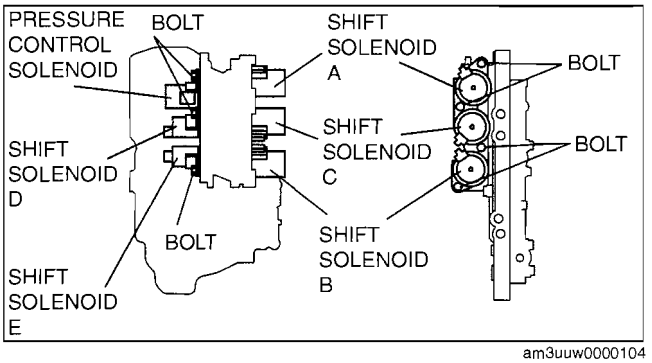
1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Remove the control valve body. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].)
5. Remove the solenoid valve (s).
6. Apply ATF to a new O-ring and install it on the solenoid valve.



am3uuw0000103

7. Install the solenoid valve in the control valve body.

   Tightening torque
   7.8—10.8 N·m
   {80—110 kgf·cm, 69.5—95.4 in·lbf}



am3uuw0000104

8. Install the control valve body. (See 05-17A-36 CONTROL VALVE BODY REMOVAL[FN4A-EL].)
9. Install the under cover.
10. Connect the negative battery cable.
11. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
12. Add ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
13. Perform the mechanical system test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)

PCM INSPECTION[FN4A-EL]

id0517a1802900

1. Inspect the PCM. (See 01-40A-13 PCM INSPECTION[LF, L3].)

PCM REMOVAL/INSTALLATION[FN4A-EL]

id0517a1803000

1. Remove and install the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].)

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL]

id0517a1802400

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Remove the following parts.
   (1) Battery, battery tray and battery box. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (3) Exhaust manifold insulator.
   (4) Front tires and splash shield.
   (5) Under cover.
3. Drain the ATF. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

Warning

- **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

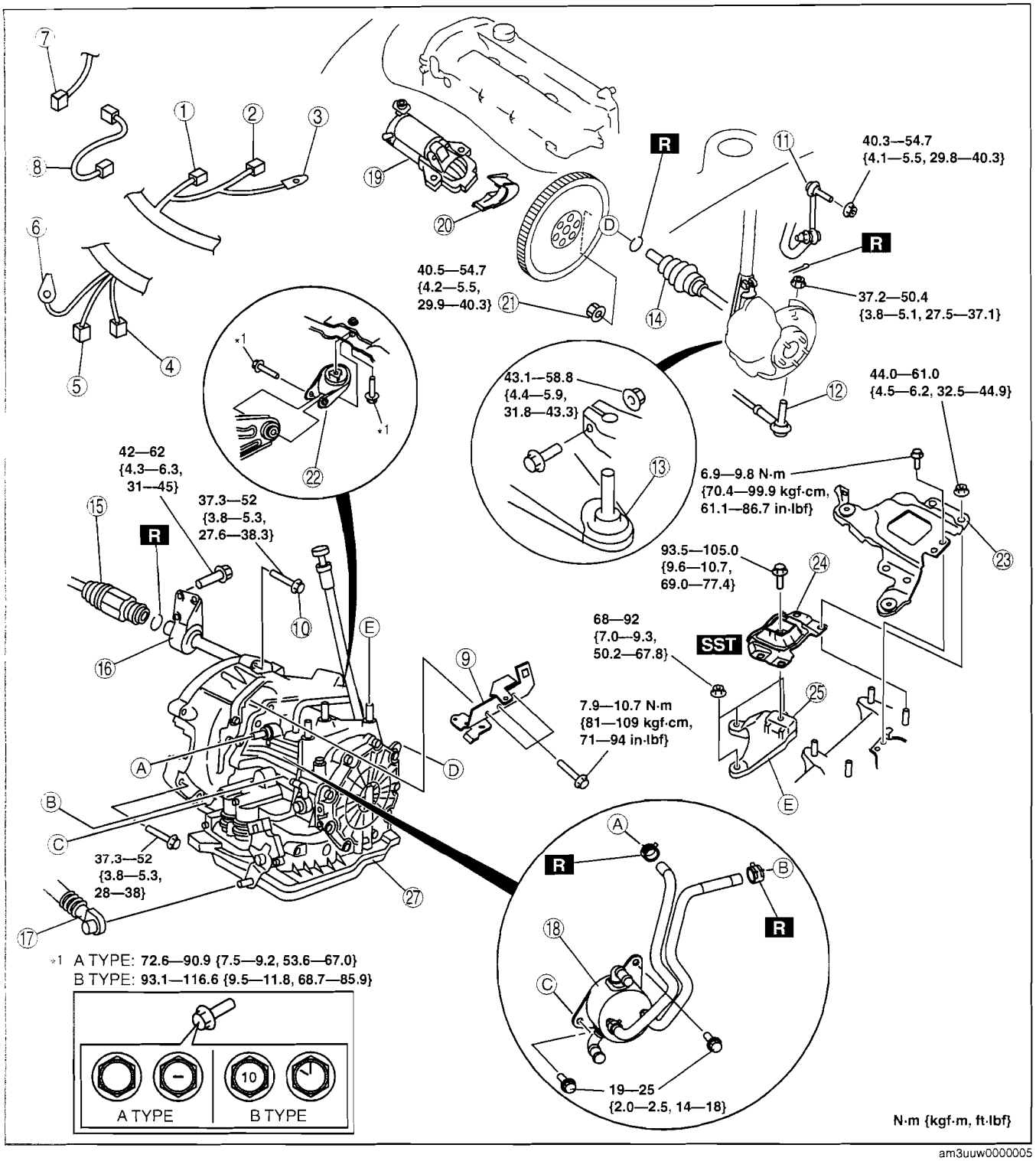
Caution

- **To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.**

4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add ATF to the specified level. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
7. Perform the following test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)(See 05-17A-6 ROAD TEST[FN4A-EL].)

Service item	Test item			
	Line pressure test	Stall test	Time lag test	Road test
ATX replacement	X			
ATX overhaul	X	X	X	X
Torque converter replacement	X	X		
Oil pump replacement	X			
Clutch system replacement	X		X	X

X : Test to be performed after the service work



am3uuw0000005

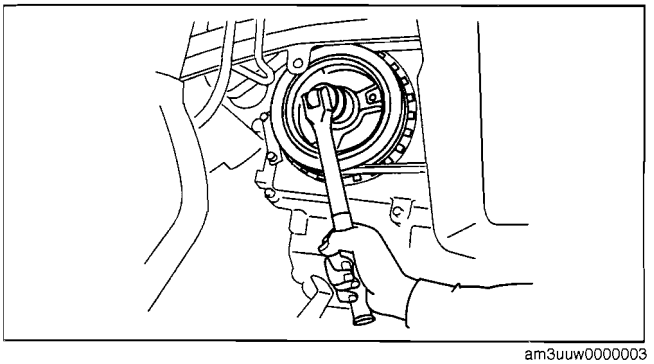
1	Input/turbine speed sensor connector
2	VSS connector
3	GND wiring harness
4	Transaxle connector
5	TR switch connector
6	GND wiring harness
7	Oil pressure switch connector (for oil filter)
8	Oil pressure switch connector (for L3 ATX)
9	Harness bracket
10	Transaxle mounting bolt (upper side)

11	Stabilizer control link
12	Tie-rod end ball joint (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.)
13	Lower arm ball joint (See 02-13-9 FRONT LOWER ARM REMOVAL/ INSTALLATION.)
14	Drive shaft (See 03-13-9 DRIVE SHAFT REMOVAL/ INSTALLATION.)

15	Drive shaft (See 03-13-9 DRIVE SHAFT REMOVAL/ INSTALLATION.)
16	Joint shaft (See 03-13-2 JOINT SHAFT REMOVAL/ INSTALLATION[LF].)
17	Selector cable
18	Oil cooler (See 05-17A-40 OIL COOLER REMOVAL/ INSTALLATION[FN4A-EL].)
19	Starter (See 01-19A-2 STARTER REMOVAL/ INSTALLATION[LF, L3].)
20	End plate cover
21	Torque converter installation nuts (See 05-17A-30 Torque Converter Nuts Removal Note.) (See 05-17A-35 Torque Converter Nuts Installation Note.)
22	No.1 engine mount rubber (See 05-17A-34 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
23	Battery tray bracket
24	No.4 engine mount rubber (See 05-17A-31 No.4 Engine Mount Removal Note.) (See 05-17A-34 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
25	No.4 engine mount bracket (See 05-17A-31 No.4 Engine Mount Removal Note.) (See 05-17A-34 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
26	Transaxle mounting bolt (lower side)
27	Transaxle (See 05-17A-32 Transaxle Removal Note.) (See 05-17A-33 Transaxle Installation Note.)

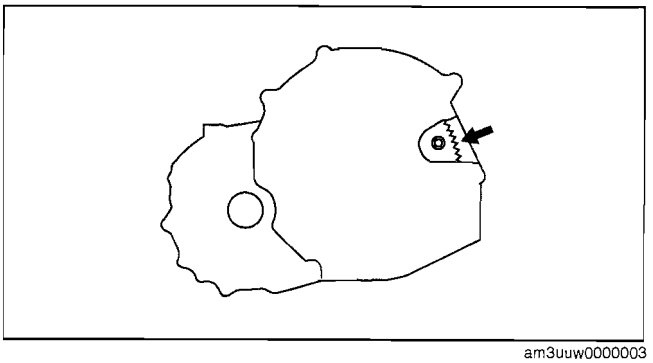
Torque Converter Nuts Removal Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.



am3uuw0000003

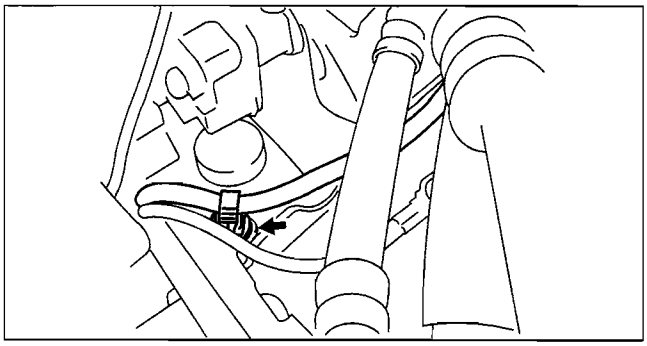
2. Remove the torque converter nuts from the starter installation hole.



am3uuw0000003

No.4 Engine Mount Removal Note

1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown in the figure.

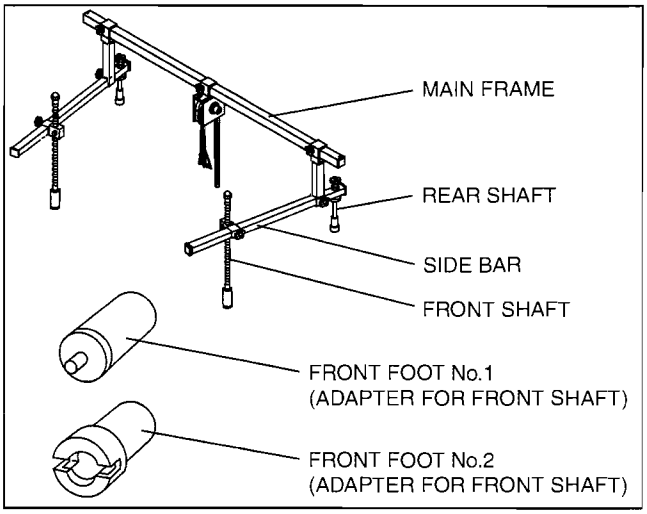


am3uuw0000003

2. Install the SST using the following procedure.

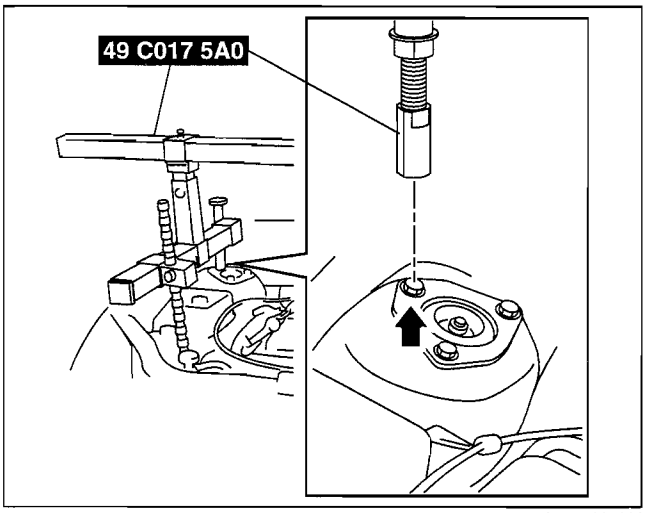
Caution

- **Refer to the SST instruction manual for the basic handing procedure.**



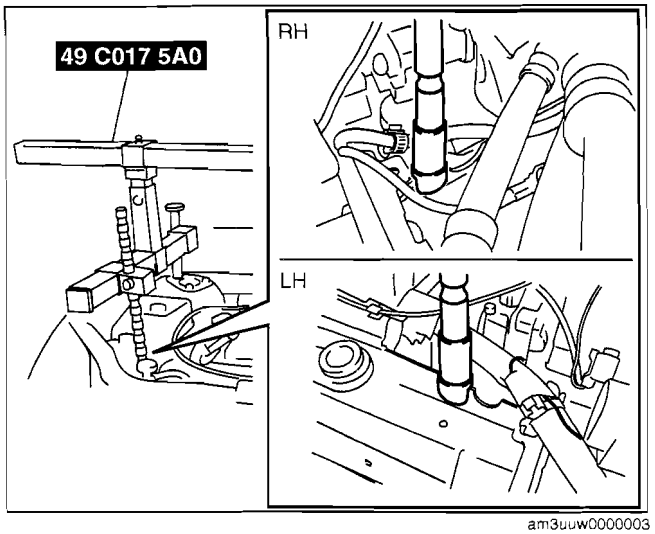
am3uuw0000003

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber (identical position to right side).



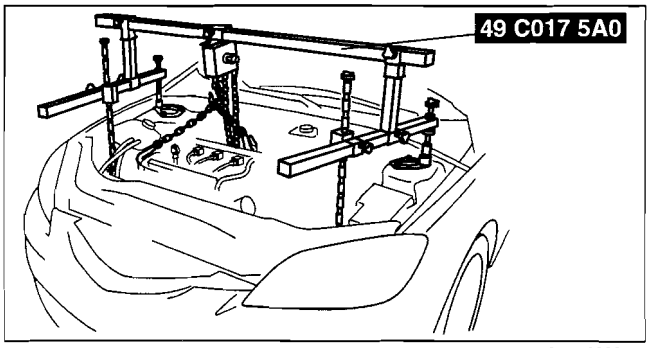
am3uuw0000003

(3) Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3uuw0000003

3. Suspend the engine using the **SST**.
4. Remove the battery tray bracket, No.4 engine mount rubber and bracket.



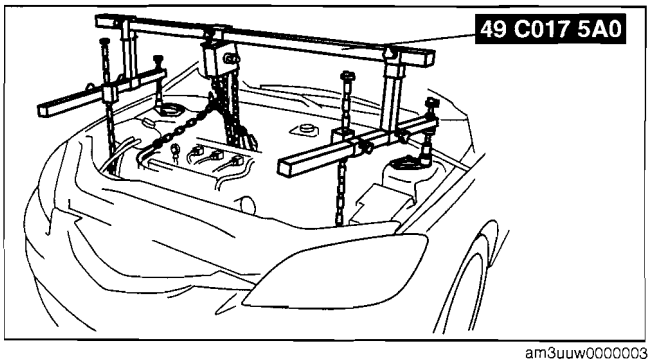
am3uuw0000003

Transaxle Removal Note

Warning
- **Remove the transaxle carefully, holding it steady. If the transmission falls it could be damaged or cause injury.**

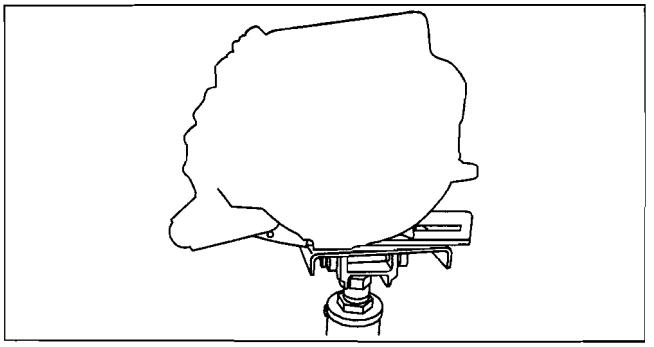
Caution
- **To prevent the torque converter and transmission from separating, remove the transmission without tilting it toward the torque converter.**

1. Lean the engine toward the transaxle.
2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.



am3uuw0000003

4. Remove the transaxle.



am3uuw0000004

Transaxle Installation Note

Warning

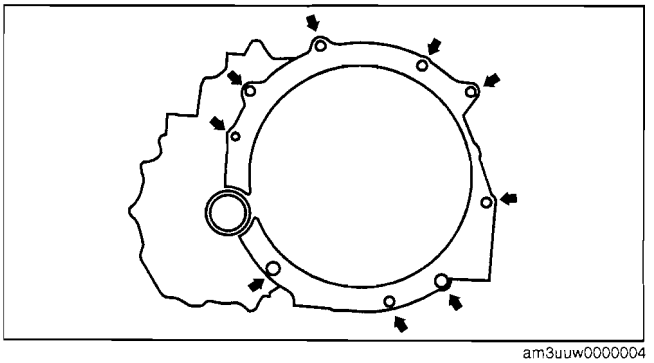
- **Install the transaxle carefully, holding it steady. If the transmission falls it could be damaged or cause injury.**

Caution

- **To prevent the torque converter and transmission from separating, install the transmission without tilting it toward the torque converter.**

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

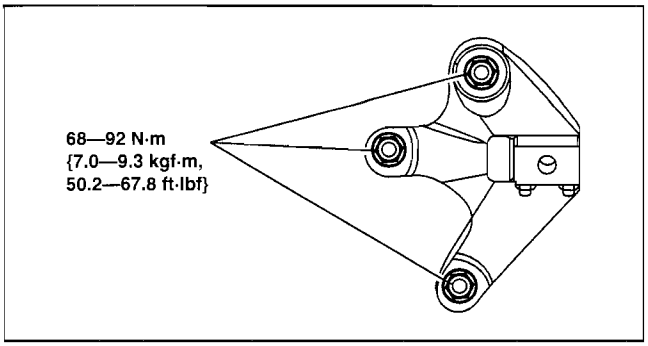
Tightening torque
37.3—52.0 N·m
{3.8—5.3 kgf·m, 27.6—38.3 ft·lbf}



am3uuw0000004

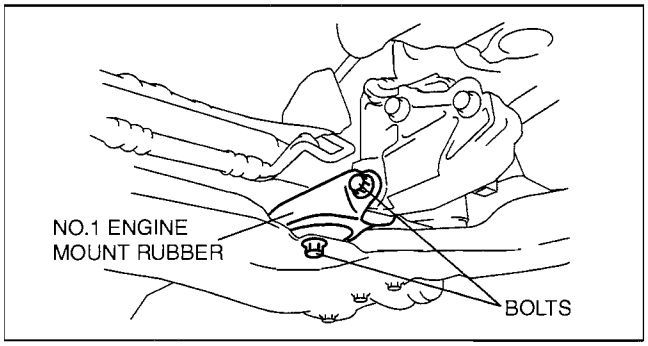
No.1 Engine Mount and No.4 Engine Mount Installation Note

1. Install the No.4 engine mount bracket on the transaxle case and tighten nuts.



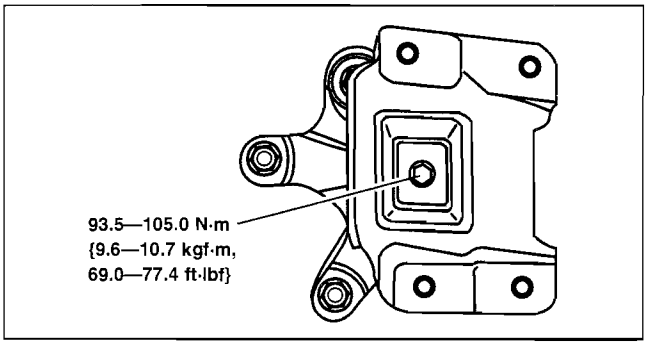
am3uuw0000074

2. Install the No.1 engine mount rubber to the crossmember and temporarily tighten bolts.



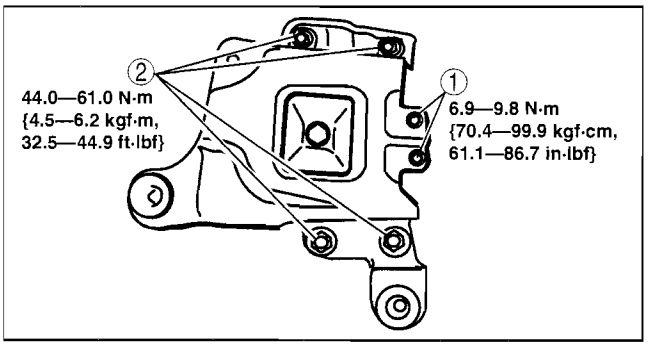
am3uuw0000004

3. Place the No.4 engine mount rubber with the body stud bolts passing through the holes and tighten the bolt as shown in the figure.



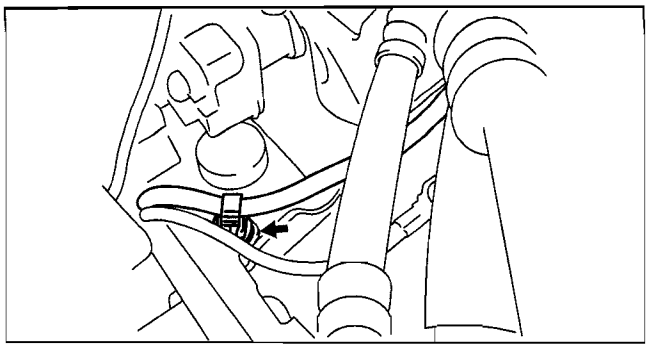
am3uuw0000004

4. Place the battery tray bracket on the No.4 engine mount rubber with body stud bolts passing through the holes and tighten bolts and nuts in the order as shown in the figure.
5. Remove the **SST**.



am3uuw0000004

6. Install the clip as shown in the figure.



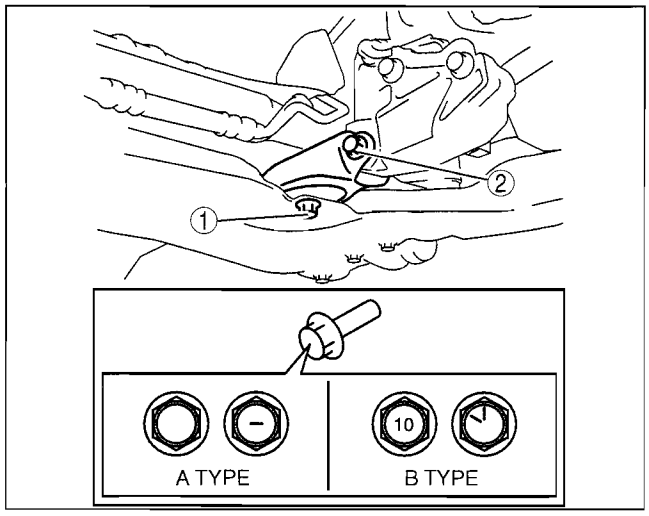
am3uuw0000003

7. Fully tighten the bolts

Caution
- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

Bolt length (measured from below the head)
Front crossmember side: 62 mm {2.441 in}
No.1 engine mount bracket side: 65 mm {2.559 in}

Tightening torque
A type: 72.6—90.9 N.m {7.5—9.2 kgf.m, 53.6—67.0 ft.lbf}
B type: 93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

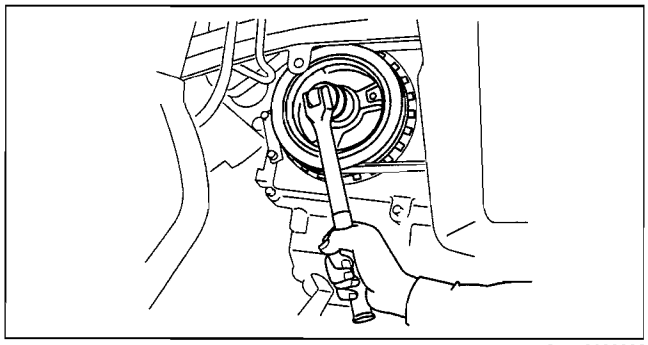


c3u515zw3204

Torque Converter Nuts Installation Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.

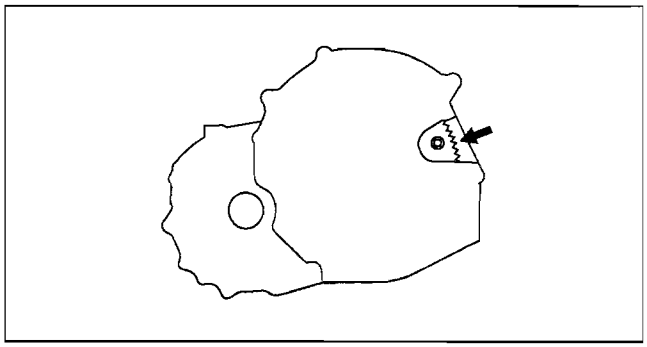
Caution
- **Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.**



am3uuw0000003

2. Tighten the torque converter mounting nuts.

Tightening torque
40.5—54.7 N·m {4.2—5.5 kgf·m, 29.9—40.3 ft·lbf}



am3uuw0000004

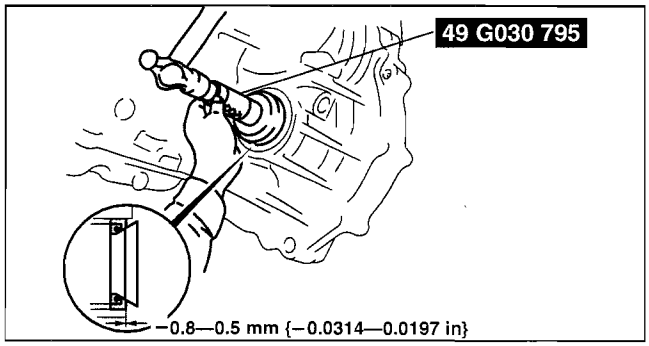
OIL SEAL REPLACEMENT[FN4A-EL]

id0517a1804400

1. Drain the ATF. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)

Caution
- **The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.**

2. Remove the drive shaft and joint shaft. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].)
3. Remove the oil seal.
4. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the transaxle case.
5. Coat the lip of the oil seal with transaxle oil.
6. Install the drive shaft and joint shaft. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-2 JOINT SHAFT REMOVAL/INSTALLATION[LF].)
7. Add ATF to the specified level. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
8. Perform the mechanical system test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)



am3uuw0000103

CONTROL VALVE BODY REMOVAL[FN4A-EL]

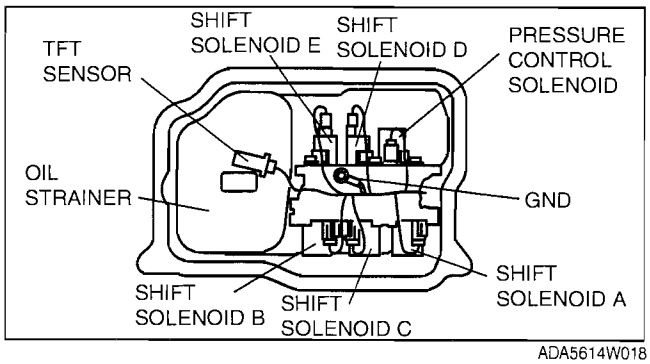
id0517a1806300

On-Vehicle Removal

Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyeglasses whenever using compressed air.**

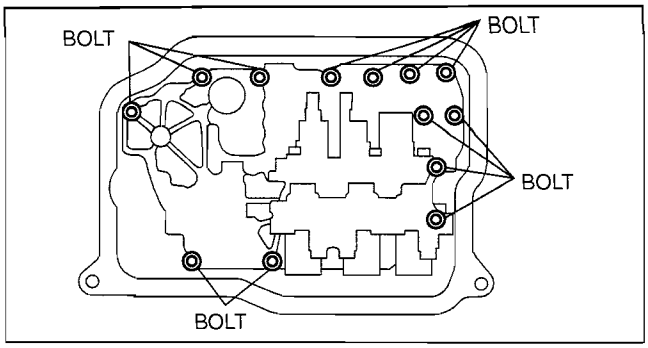
Caution
- **Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Drain the ATF into a separate suitable container. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
4. Remove the under cover.
5. Remove the oil pan.
6. Disconnect the solenoid connectors and GND.
7. Remove the oil strainer.



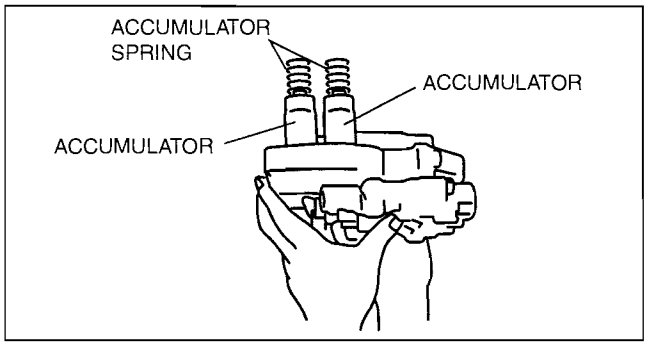
ADA5614W018

8. Remove the control valve body installation bolts as shown in the figure, then remove the control valve body component as shown in the figure.



B3E0517W074

9. Remove the accumulators and accumulator springs.



B3E0517W075

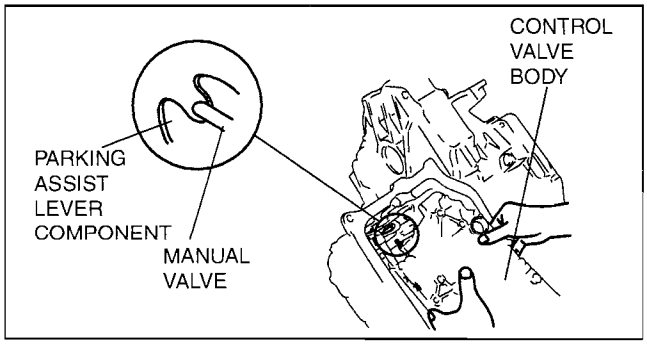
CONTROL VALVE BODY INSTALLATION[FN4A-EL]

id0517a1806200

On-Vehicle Installation

Caution

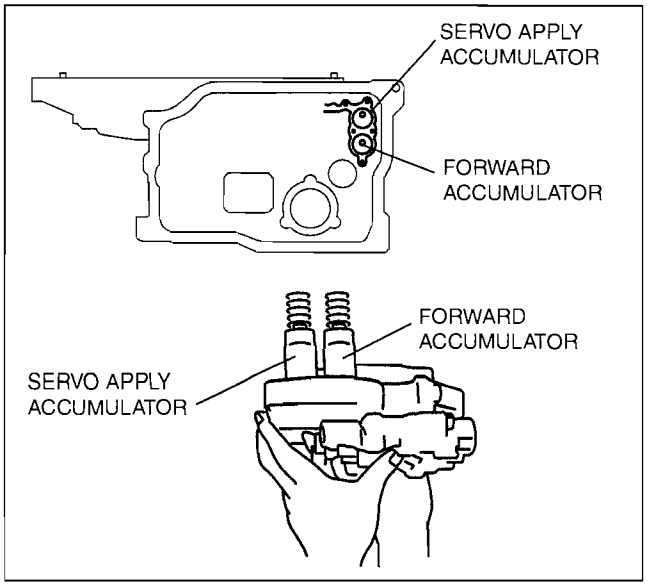
- **Be sure to align the parking rod and the manual valve.**



B6U0517W023

1. Install the accumulator springs and accumulators into the transaxle case.

Spring	Outer diameter (mm {in})	Free Length (mm {in})	No. of coils	Wire diameter (mm {in})
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator large spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator small spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}

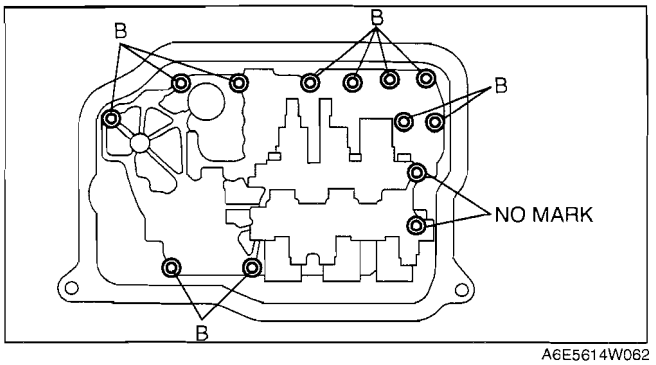


B3E0517W076

2. Install the control valve body component.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

Bolt length (measured from below the head)
Mark B: 40 mm {1.575 in}
No mark: 70 mm {2.756 in}

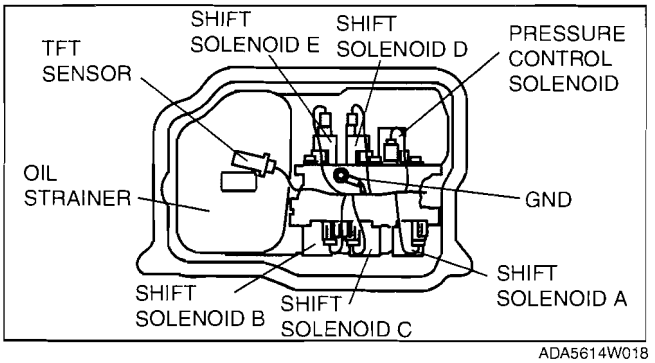


A6E5614W062

3. Install the oil strainer.

4. Match the harness colors, then connect the solenoid connectors and GND, and install the TFT sensor.

Spring	Color of connector (harness side)
Pressure control solenoid	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	White
Shift solenoid E	Black



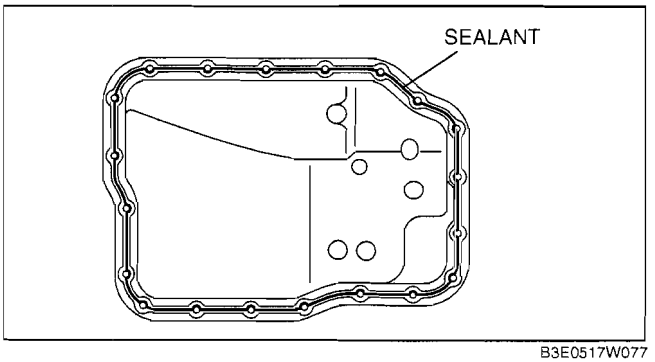
ADA5614W018

5. Install the GND.

Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

6. Apply a light coat of silicon sealant to the contact surfaces of the oil pan and transaxle case.
7. Install the oil pan.

Tightening torque
6—8 N·m {62—81 kgf·cm, 53—70 in·lbf}



B3E0517W077

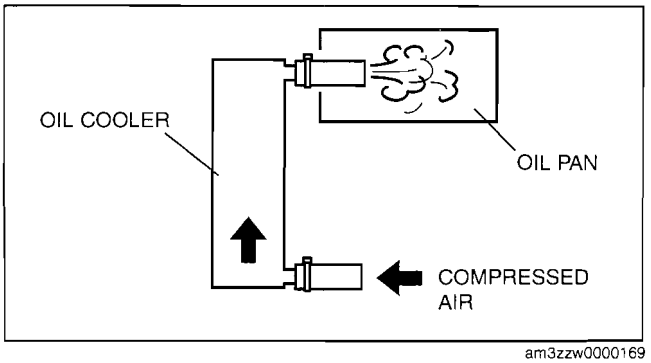
8. Install the under cover.
9. Connect the negative battery cable.
10. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
11. Add ATF and with the engine idling, inspect the ATF level. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
12. Perform the mechanical system test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)

OIL COOLER FLUSHING[FN4A-EL]

id0517a1801500

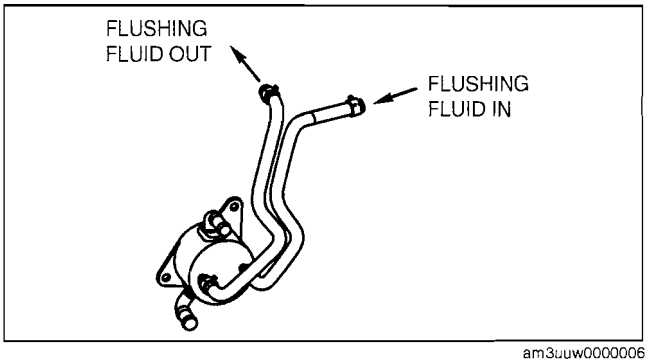
Note
- If the automatic transaxle is replaced, flush and inspect the oil cooler.
- When replacing the automatic transaxle, inspect the oil cooler together with flushing it using the following procedure, and with the oil cooler hose removed.

1. Disconnect the oil cooler hose.
2. Set a clean oil pan up to the oil cooler hose inlet.



am3zzw0000169

3. Blow **491—882 kPa {5—9 kgf/cm^2, 72—127 psi}** of compressed air from the oil cooler hose outlet to drain remaining oil.
4. Add new ATF from the oil cooler hose outlet and blow **491—882 kPa {5—9 kgf/cm^2, 72—127 psi}** of compressed air to flush. (Repeat 2 or 3 times)
5. Verify that none of the following foreign material is mixed in with the drained ATF:
   - Large metal fragments of ϕ 0.5 mm {0.02 mm} or more that cannot pass through the oil strainer
   - Fibrous clutch facing
6. Repeat the procedures from Step 3 to 4 and flush the inside of the oil cooler.



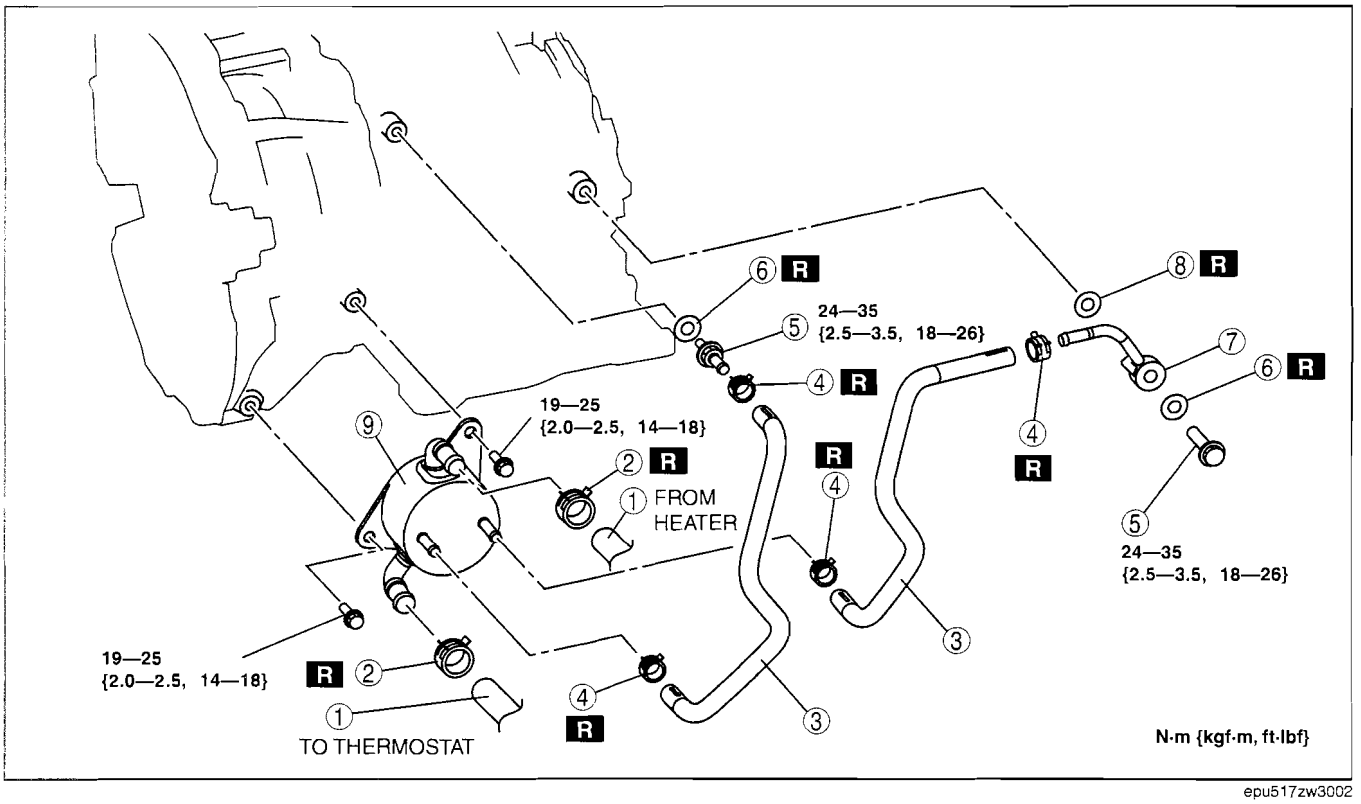
am3uuw0000006

7. If foreign material such as metal fragments or clutch facing remains even after the oil cooler is flushed repeatedly, replace the oil cooler (radiator).

OIL COOLER REMOVAL/INSTALLATION[FN4A-EL]

id0517a1801600

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
4. Remove the under cover.
5. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
6. Drain the ATF into a container. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Refill the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
10. Inspect the engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)
11. Add ATF to the specified level. (See 05-17A-9 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FN4A-EL].)
12. Inspect for oil leakage from the oil pipes and oil hoses.
13. Inspect for coolant from the hoses.
14. Inspect the ATF level and condition. (See 05-17A-8 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FN4A-EL].)
15. Perform the line pressure test. (See 05-17A-3 MECHANICAL SYSTEM TEST[FN4A-EL].)



epu517zw3002

1	Water hose
2	Hose clamp
3	Oil hose (See05-17A-41 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
4	Hose clamp (See 05-17A-41 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)

5	Connector bolt
6	Packing
7	Oil pipe
8	Packing
9	Oil cooler (See 05-17A-41 Oil Cooler Installation Note.)

Oil Cooler Installation Note

1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

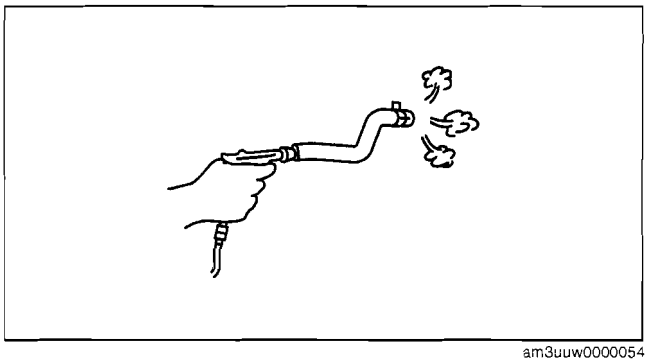
Note

- Flushing must be performed after installation of the overhauled or replaced transaxle.

2. Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

1. Apply compressed air to the cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than 1 min**.

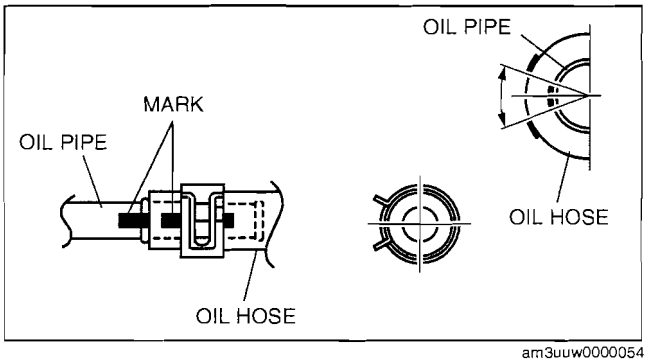


am3uuw0000054

2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.

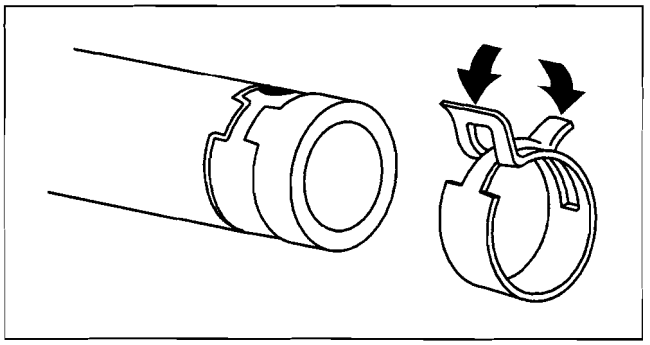
Note

- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose clamp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in place.



am3uuw0000054

3. Install the new hose clamp onto the hose.
4. Verify that the hose clamp does not interfere with any other components.



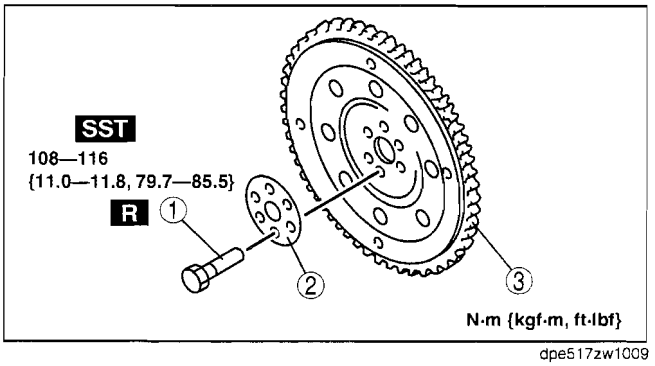
am3uuw0000054

DRIVE PLATE REMOVAL/INSTALLATION[FN4A-EL]

id0517a1802500

1. Remove the transaxle. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FN4A-EL].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

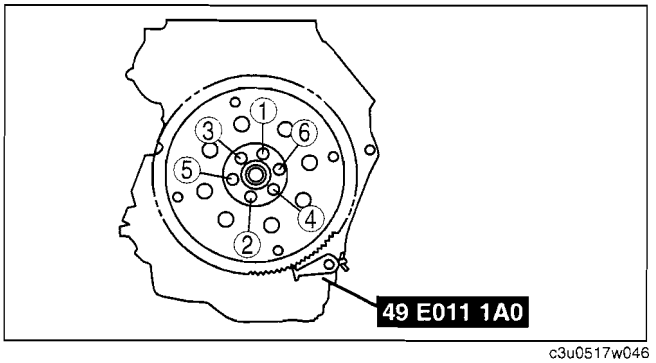
1	Drive plate mounting bolts (See 05-17A-42 Drive Plate Mounting Bolts Removal Note.)
2	Backing plate
3	Drive plate (See 05-17A-42 Drive Plate Installation Note.)



dpe517zw1009

Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.
2. Remove the bolts and the drive plate.



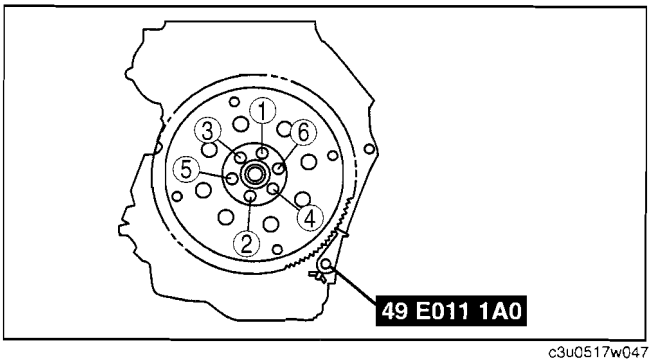
c3u0517w046

Drive Plate Installation Note

1. Remove the sealant from bolt holes in the crankshaft and from the drive plate mounting bolts.
2. Install the drive plate.
3. Install the backing plate.
4. Set the **SST** or equivalent against the drive plate.
5. Tighten the drive plate mounting bolts in two or three steps in the order as shown in the figure.

   Tightening torque
   108—116 N·m
   {11.0—11.8 kgf·m, 79.7—85.5 ft·lbf}

6. Install the transaxle. (See 05-17A-28 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FN4A-EL].)

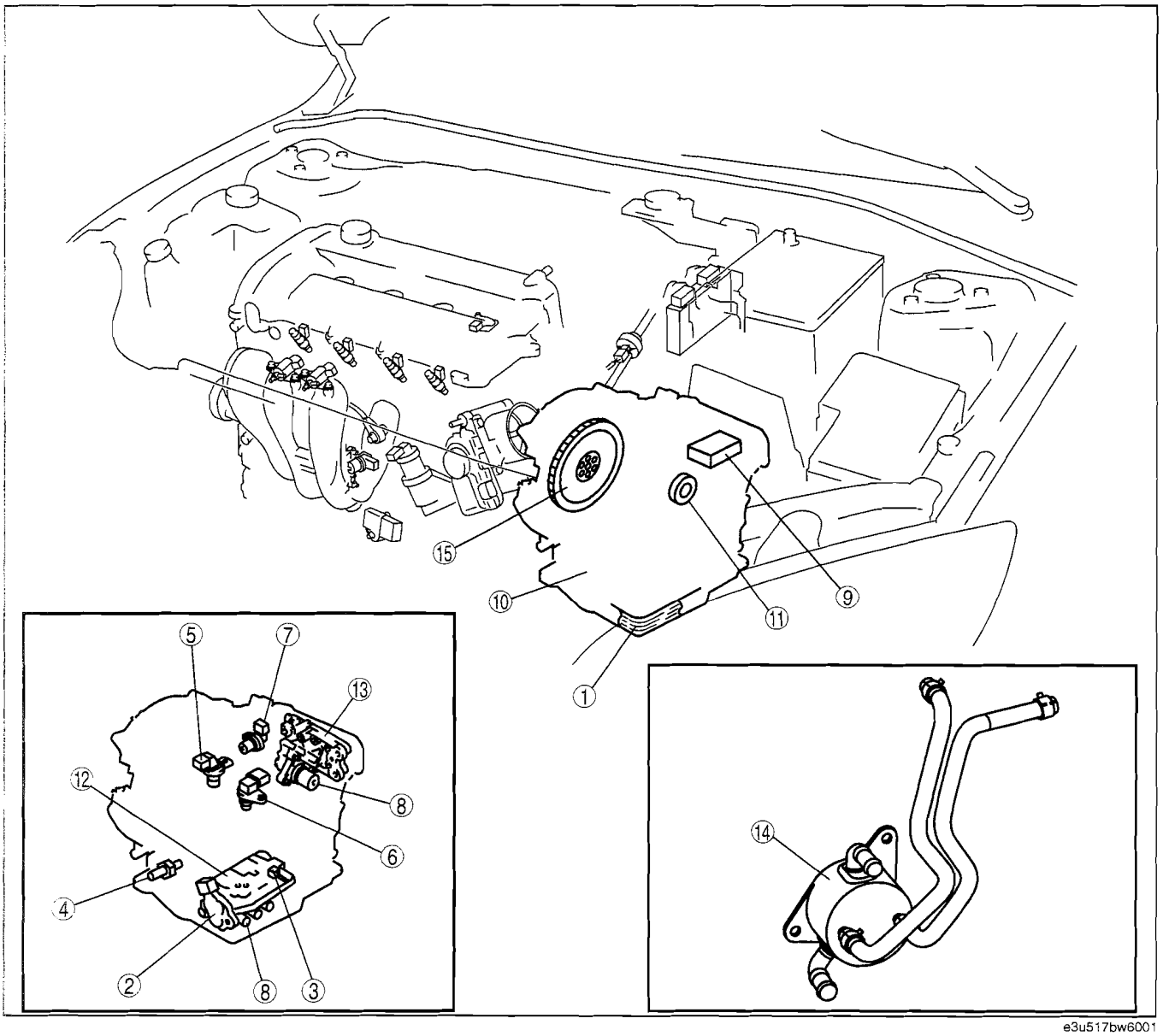


c3u0517w047

05-17B AUTOMATIC TRANSAXLE [FS5A-EL]

AUTOMATIC TRANSAXLE LOCATION INDEX[FS5A-EL]

id051721802000



e3u517bw6001

1	Automatic transaxle fluid (ATF) (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].) (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)

2	Transaxle range (TR) switch (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].) (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].) (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)

3	Transaxle fluid temperature (TFT) sensor (See 05-17B-19 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FS5A-EL].) (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
4	Oil pressure switch (See 05-17B-22 OIL PRESSURE SWITCH INSPECTION[FS5A-EL].) (See 05-17B-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
5	Input/turbine speed sensor (See 05-17B-24 INPUT/TURBINE SPEED SENSOR INSPECTION[FS5A-EL].) (See 05-17B-25 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
6	Intermediate sensor (See 05-17B-25 INTERMEDIATE SENSOR INSPECTION[FS5A-EL].) (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
7	Vehicle speed sensor (See 05-17B-28 VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL].) (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)
8	Solenoid valve (See 05-17B-30 SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) (See 05-17B-32 SOLENOID VALVE REMOVAL/INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].) (See 05-17B-33 SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].) (See 05-17B-34 SOLENOID VALVE REMOVAL/INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)
9	TCM (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
10	Automatic transaxle (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
11	Oil seal (See 05-17B-51 OIL SEAL REPLACEMENT[FS5A-EL].)
12	Primary control valve body (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-52 PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
13	Secondary control valve body (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].) (See 05-17B-55 SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL].)
14	Oil cooler (See 05-17B-56 OIL COOLER FLUSHING[FS5A-EL].) (See 05-17B-56 OIL COOLER REMOVAL/INSTALLATION[FS5A-EL].)
15	Drive plate (See 05-17B-58 DRIVE PLATE REMOVAL/INSTALLATION[FS5A-EL].)

MECHANICAL SYSTEM TEST[FS5A-EL]

id051721802100

Mechanical System Test Preparation

1. Apply the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See 01-12A-2 COOLING SYSTEM SERVICE WARNINGS[LF, L3].) (See 01-12A-2 ENGINE COOLANT LEVEL INSPECTION[LF, L3].)
3. Inspect the engine oil. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
4. Inspect the ATF levels. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
5. Inspect the idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
6. Inspect the ignition timing. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)

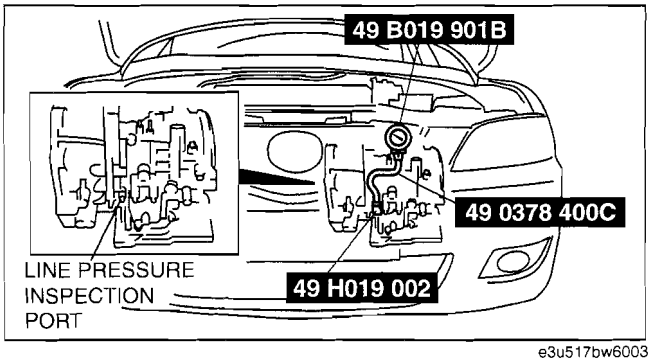
Line Pressure Test

1. Perform mechanical system test preparation. (See 05-17B-3 Mechanical System Test Preparation.)

Warning

- **Removing the square head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square head plug, allow the ATF to cool.**

2. Connect the **SSTs** (49 H019 002 and, 49 0378 400C) to the line pressure inspection port and replace the gauge of the **SST** (49 0378 400C) with the **SST** (49 B019 901B).
3. Start the engine and warm it up until the ATF reaches **60—70 °C {140—158 °F}**.
4. Shift the selector lever to the D range.
5. Read the line pressure while the engine is idling for the D range.
6. Read the line pressure while the engine is idling for the R position and M (1GR, 2GR) range in the same manner as in Steps 4—5.
7. Stop the engine, then replace the **SST** (49 B019 901B) with the gauge of the **SST** (49 0378 400C).
8. Start the engine.
9. Firmly depress the brake pedal with the left foot.
10. Shift the selector lever to the D range.



e3u517bw6003

Caution

- **If the accelerator pedal is pressed for more than 5 s while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 11 and 12 within 5 s.**

11. Gradually depress the accelerator pedal with the right foot.
12. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
13. Shift the selector lever to the N position and idle the engine for **1 min or more** to cool the ATF.
14. Read the line pressure at the engine stall speed for the M (1GR, 2GR) range and R position in the same manner as in Steps 9—13.

Line pressure specification

Position/range	Line pressure (kPa {kgf/cm^2, psi})	
	Idle	Stall
D, M (1GR, 2GR)	330—470 {3.4—4.8, 48—68}	1,200—1,320 {12.2—13.5, 174—191}
R	490—710 {5.0—7.2, 71—102}	1,640—1,860 {16.8—18.9, 238—269}

Warning

- **Removing the SST when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SST, allow the ATF to cool.**

15. Remove the **SSTs**.
16. Install a new square head plug in the inspection port.

Tightening torque

4.8—9.8 N·m {49—99 kgf·cm, 43—85 in·lbf}

Evaluation of line pressure test

Condition	Possible cause
Low pressure in all positions/ranges	• Worn oil pump • Oil leaking from oil pump, control valve body, and/or transaxle case • Pressure regulator valve stuck • Pressure control solenoid malfunction • Solenoid reducing valve stuck
Low pressure in D, M (1GR, 2GR) only	• Oil leaking from forward clutch hydraulic circuit
Low pressure in M (2GR) only	• Oil leaking from 2-4 brake band hydraulic circuit
Low pressure in M (1GR), R only	• Oil leaking from low and reverse brake hydraulic circuit
Low pressure in R only	• Oil leaking from reverse clutch hydraulic circuit
Higher pressure in all positions/ranges	• Pressure control solenoid malfunction and/or open harness • Pressure regulator valve stuck • TCM malfunction

Stall Test

1. Perform mechanical system test preparation. (See 05-17B-3 Mechanical System Test Preparation.)
2. Start the engine and shift the selector lever to R position.

Caution

- **Do not maintain WOT in any position/range for more than 5 seconds, or transaxle damage will occur.**

3. Firmly depress the brake pedal with the left foot, and depress the accelerator pedal to floor (WOT) with the right.
4. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
5. Shift the selector lever to N position and let the engine idle for **1 minute** or more to cool the ATF.
6. Perform stall tests of D, M (1GR, 2GR) ranges in the same manner.
7. Turn off the engine.

Engine stall speed

Position/range	Engine stall speed (rpm)
D, M (1GR, 2GR)	2,200—2,800
R	

Evaluation of stall test

Condition		Possible cause
Above specification	Insufficient line pressure, torque converter pressure	• Worn oil pump
		• Oil leaking from oil pump, control valve, and/or transaxle case
		• Pressure regulator valve sticking
		• Converter relief valve sticking
		• Pressure control solenoid malfunction
	In D, M (1GR, 2GR) ranges	• Forward clutch slipping
	In M (2GR) range	• 2-4 brake band slipping
	In M (1GR) range and R position	• Low and reverse brake slipping
	In R position	• Low and reverse brake slipping • Reverse clutch slipping • Perform road test to determine whether problem is in low and reverse brake or reverse clutch • Engine braking felt in M (1GR) range: Reverse clutch is defective. • Engine braking not felt in M (1GR) range: Low and reverse brake is defective.
Below specification		• Engine lack of power

Time Lag Test

1. Perform mechanical system test preparation. (See 05-17B-3 Mechanical System Test Preparation.)
2. Start the engine and warm up the engine until the ATF temperature reaches **60—70 °C {141— 158 °F}**.
3. Shift the selector lever from N position to D range.
4. Use a stopwatch to measure the time it takes from shifting until engagement is felt. Take 3 measurements for each test and average the results using the following formula.

Formula

$$\text{Average time lag} = \frac{\text{Time 1} + \text{Time 2} + \text{Time 3}}{3}$$

x3u517wd8

5. Perform the test for the following shifts in the same manner.
   - N position→R position

Average time lag

N position→D range: 0.4—0.7 sec.
N position→R position: 0.4—0.7 sec.

Evaluation of time lag test

Condition		Possible cause
N→D shift	More than specification	• Low line pressure • Forward clutch slipping • Oil leaking from forward clutch fluid circuit • Shift solenoid A not operating properly
	Less than specification	• Forward accumulator not operating properly • Shift solenoid A not operating properly • Excessive line pressure
N→R shift	More than specification	• Low line pressure • Low and reverse brake slipping • Reverse clutch slipping • Shift solenoid B not operating properly
	Less than specification	• Servo apply accumulator not operating properly • Shift solenoid B not operating properly • Excessive line pressure

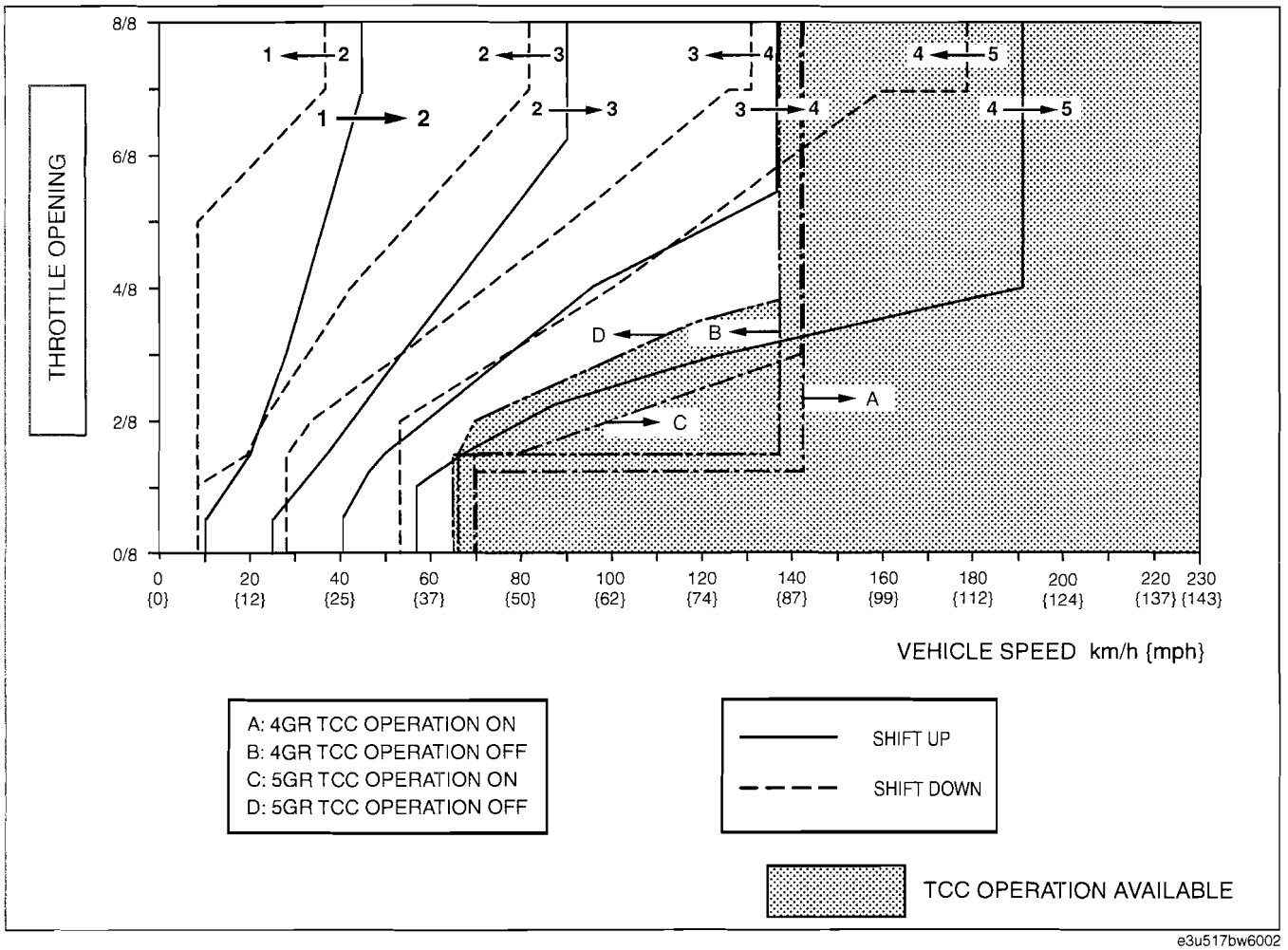
ROAD TEST[FS5A-EL]

id051721802200

Road Test Preparation

1. Inspect the engine coolant. (See 01-12A-2 COOLING SYSTEM SERVICE WARNINGS[LF, L3].) (See 01-12A-2 ENGINE COOLANT LEVEL INSPECTION[LF, L3].)
2. Inspect the engine oil level. (See 01-11A-2 ENGINE OIL LEVEL INSPECTION[LF, L3].)
3. Inspect the ATF level. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
4. Inspect the idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
5. Inspect the ignition timing. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].)
6. Bring up the engine and transaxle to normal operating temperature.

Shift Diagram
D range (normal mode)



e3u517bw6002

D Range Test

1. Perform road test preparation. (See 05-17B-6 Road Test Preparation.)
2. Shift the selector lever to D range.
3. Accelerate the vehicle at half and wide open.
4. Verify that 1→2, 2→3, 3→4 and 4→5 upshifts and downshifts are obtained. The shift points must be as shown in the table below.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)
5. Drive the vehicle in 5GR, 4GR, 3GR, and 2GR and verify that kickdown occurs for 5→4, 4→3, 3→2, 2→1 downshifts, and that the shift points are as shown in the table below.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)
6. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR, 4GR and 5GR.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)
7. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	Wide open throttle	$D_1 \rightarrow D_2$	44—49 {28—30}	5,250—5,950
			$D_2 \rightarrow D_3$	88—95 {55—58}	5,700—6,150
			$D_3 \rightarrow D_4$	134—144 {84—89}	5,800—6,200
			TCC ON (D_4)	139—149 {87—92}	4,400—4,650
			$D_4 \rightarrow D_5$	189—198 {118—122}	5,950—6,200
			TCC ON (D_5)	139—149 {87—92}	3,250—3,450
		Half throttle	$D_1 \rightarrow D_2$	28—36 {18—22}	3,450—4,350
			$D_2 \rightarrow D_3$	56—72 {35—44}	3,600—4,700
			$D_3 \rightarrow D_4$	84—114 {53—70}	3,650—4,900
			TCC ON (D_4)	133—151 {83—93}	4,200—4,700
			$D_4 \rightarrow D_5$	140—174 {87—107}	4,400—5,450
			TCC ON (D_5)	133—151 {83—93}	3,100—3,500
		Closed throttle position	$D_5 \rightarrow D_4$	50—56 {31—34}	1,200—1,300
			$D_4 \rightarrow D_3$	25—31 {16—19}	800—950
			$D_3 \rightarrow D_2$	5—11 {4—6}	250—450
			$D_2 \rightarrow D_1$	5—11 {4—6}	350—700
			$D_3 \rightarrow D_1$	5—11 {4—6}	250—450
		Kickdown	$D_5 \rightarrow D_4$	174—183 {108—113}	4,050—4,250
			$D_4 \rightarrow D_3$	126—135 {79—83}	3,950—4,250
			$D_3 \rightarrow D_2$	78—85 {49—52}	3,350—3,650
			$D_2 \rightarrow D_1$	34—39 {22—24}	2,150—2,500
	POWER	Wide open throttle	$D_1 \rightarrow D_2$	44—49 {28—30}	5,250—5,950
			$D_2 \rightarrow D_3$	88—95 {55—58}	5,700—6,150
			$D_3 \rightarrow D_4$	135—144 {84—89}	5,850—6,200
		Half throttle	$D_1 \rightarrow D_2$	30—38 {19—23}	3,700—4,600
			$D_2 \rightarrow D_3$	61—80 {38—49}	3,950—5,150
			$D_3 \rightarrow D_4$	89—117 {56—72}	3,850—5,050
		Closed throttle position	$D_4 \rightarrow D_3$	32—38 {20—23}	1,050—1,150
			$D_3 \rightarrow D_2$	5—11 {4—6}	250—450
			$D_2 \rightarrow D_1$	5—11 {4—6}	350—700
			$D_3 \rightarrow D_1$	5—11 {4—6}	250—450
		Kickdown	$D_4 \rightarrow D_3$	126—135 {79—83}	3,950—4,250
			$D_3 \rightarrow D_2$	78—85 {49—52}	3,350—3,650
			$D_2 \rightarrow D_1$	34—39 {22—24}	2,150—2,500

M Range Test

1. Perform road test preparation. (See 05-17B-6 Road Test Preparation.)
2. Shift the selector lever to M range.
3. Verify that 1→2, 2→3, 3→4 and 4→5 upshifts and 5→4, 4→3, 3→2, and 2→1 downshifts are obtained by manual shifting of the selector lever forward and back.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)
4. Decelerate the vehicle and verify that 5→4, 4→3 3→2, 2→1 and 3→1 downshifts are obtained. The shift points must be as shown in the table below.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)
5. Decelerate the vehicle and verify that engine braking effect is felt in all gears.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)

6. Drive the vehicle and verify that TCC operation is obtained in 4GR and 5GR. The operation points must be as shown in the table below.
   - If there is any malfunction, inspect the TCM and ATX. (See 05-17B-36 TCM INSPECTION[FS5A-EL].) (See ATX Workshop Manual.)

Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
M	Manual	Half throttle	TCC ON (M_4)	133—151 {83—93}	4,200—4,700
			TCC ON (M_5)	137—147 {85—91}	3,200—3,400
		All round	$M_5 \rightarrow M_4$	27—33 {17—20}	650—750
			$M_4 \rightarrow M_3$	27—33 {17—20}	850—1,000
			$M_3 \rightarrow M_2$	7—13 {5—8}	350—550
			$M_2 \rightarrow M_1$	7—13 {5—8}	500—800
			$M_3 \rightarrow M_1$	7—13 {5—8}	350—550
		Kickdown	$M_5 \rightarrow M_4$	177—187 {110—115}	4150—4350
			$M_4 \rightarrow M_3$	128—138 {80—85}	4050—4300
			$M_3 \rightarrow M_2$	44—52 {28—32}	1950—2200
			$M_2 \rightarrow M_1$	9—15 {6—9}	600—950

P Position Test

1. Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.
   - If the vehicle rolls, inspect the ATX. (See ATX Workshop Manual.)

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL]

id051721800500

Automatic Transaxle Fluid (ATF) Condition Inspection

1. One way of determining whether the transaxle should be disassembled is by noting:
   - If the ATF is muddy or varnished.
   - If the ATF smells strange or unusual.

ATF Condition

Condition			Possible cause
Clear red		Normal	—
Light red: pink		Contaminated with water	• Broken oil cooler inside of radiator • Poor filler tube installation: Problem could be occurring to parts inside the transaxle by water contamination. It is necessary to overhaul transaxle and detect defected parts. If necessary, exchange transaxle.
Reddish brown	Has burnt smell and metal specks are found	Deteriorated ATF	Defect powertrain components inside of transaxle: Specks cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator. • When large amount of metal specks are found, overhaul transaxle and detect defected parts. If necessary, exchange transaxle. • Implement flushing operation as there is a possibility to have specks plugging up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	Normal	• Discoloration by oxidation

Automatic Transaxle Fluid (ATF) Level Inspection

Caution
- **If there is no ATF adhering to the dipstick after warming up the engine, there is insufficient ATF. Therefore do not drive the vehicle as it could damage the ATX.**
- **If a final inspection of the ATF level is performed without driving the vehicle, or the ATF amount is inspected while the ATF temperature is not at about 60—70 °C {140—158 °F}, the ATX could be damaged because the ATF level inspection would be incorrect.**
- **If too much ATF is added, the ATF temperature will increase and oil could leak from the breather hose.**

Note
- The dipstick of the FS5A-EL type measures the ATF level on the differential side and, under the condition that the ATF temperature on the differential side does not rise even after warming up the engine, ATF adhering to the end of the dipstick is normal.

1. Park the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
3. Verify visually that there is no ATF leakage from the oil hose or housing.

Caution
- **If the oil level decreases dramatically while warming up the engine, do not shift the selector lever as it could damage the ATX.**

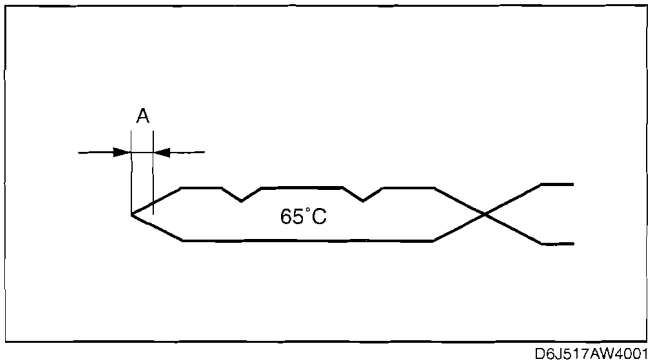
4. Start the engine and warm it up in the P position.
5. Verify that the ATF level is in the range while the engine is idling.

ATF adherence range
A: Within 5 mm {0.197 in}

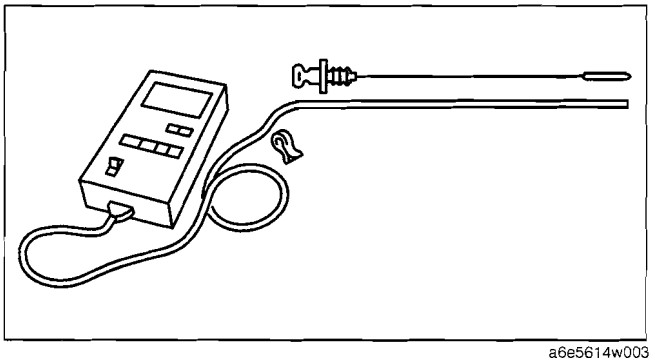
- If necessary, add ATF to the specification.

ATF type
ATF M-V

6. Shift the selector lever and pause momentarily in each range (P—M) while depressing the brake pedal.
7. Shift the selector lever to P position.
8. Drive on city roads at a minimum of 5 km.
9. Adjust the length or thermometer probe so that the length is the same as the depth gauge, and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
10. Warm up the engine until the ATF reaches **60—70 °C {140—158 °F}**.

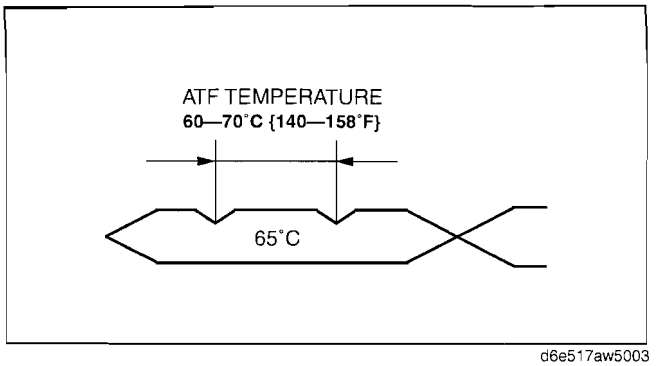


D6J517AW4001


a6e5614w003

11. Verify that the ATF level is in the range while the engine is idling.
    - If necessary, add ATF to the specification.

ATF type
ATF M-V



d6e517aw5003

AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL]

id051721800600

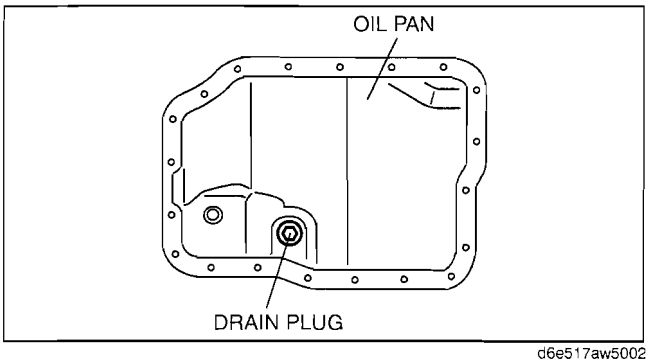
Warning
- **When the transaxle and ATF are hot, they can badly burn you. Turn off the engine and wait until they are cool before changing the ATF.**

1. Remove the oil dipstick.
2. Remove the oil drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and drain plug.

Tightening torque
29.4—41.2 N·m {3.0—4.2 kgf·m, 22—30 ft·lbf}

5. Add the specified ATF until ATF level reaches lower notch of dipstick type of ATF through the oil filler tube.

ATF type
ATF M-V



d6e517aw5002

Capacity (approx. quantity)
Draining ATF from drain plug: 3.0 L {3.2 US qt, 2.4 Imp qt}
Overhauling ATX: 5.0 L {5.3 US qt, 4.4 Imp qt}

6. Adjust the ATF amount to within the specified range according to the ATF inspection procedure. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)

Note
- The full amount of ATF for the ATX is as follows

Capacity (approx. quantity)
8.14 L {8.6 US qt, 7.2 Imp qt}

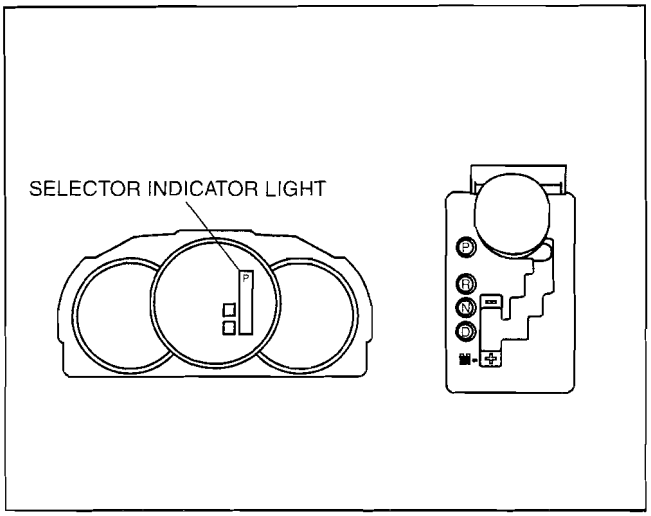
TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL]

id051721800900

Operating Inspection

1. Verify that the starter operates only when the ignition switch is turned to the START position with the selector lever in P or N position.
   - If there is any malfunction, adjust the TR switch.
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
   - If there is any malfunction, adjust the TR switch.

3. Verify that the positions of the selector lever and the indicator are aligned.
   - If there is any malfunction, adjust the TR switch.

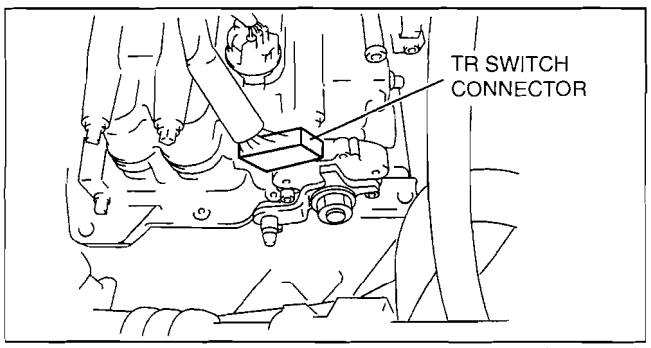


B3E0518W002

Continuity Inspection

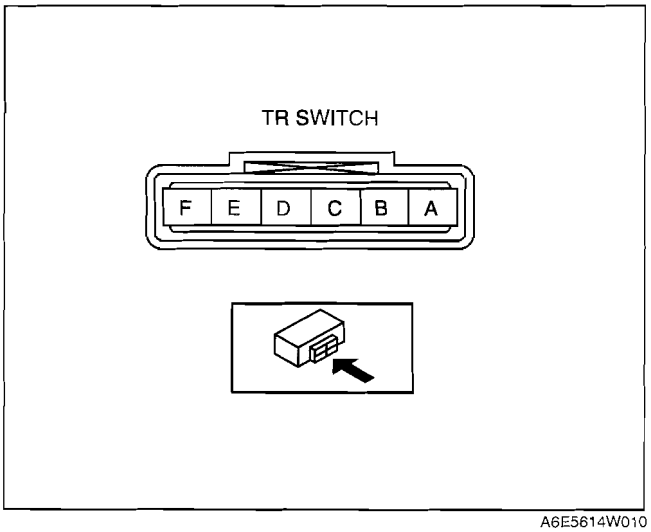
Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the TR switch connector.



d6e517aw5004

5. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, adjust the TR switch and go to Step 5.



A6E5614W010

○—○ : Continuity

Position/Range	Connector terminal			
	A	F	D	E
P	○—○			
R			○—○	
N	○—○			
D				

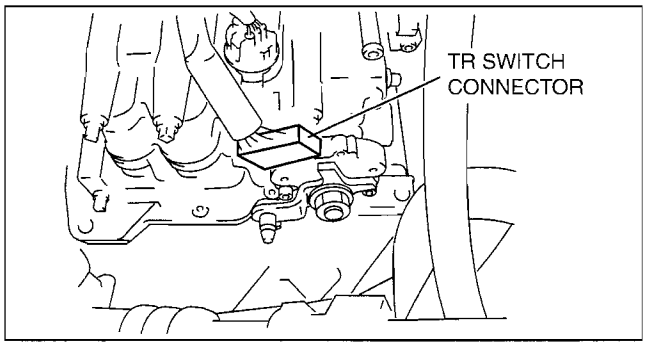
B3E0517W006

6. Reinspect for continuity at TR switch.
   - If there is any malfunction, replace the TR switch. (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
7. Connect the TR switch connector.
8. Install the under cover.
9. Connect the negative battery cable.
10. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Resistance Inspection (On-Vehicle Inspection)

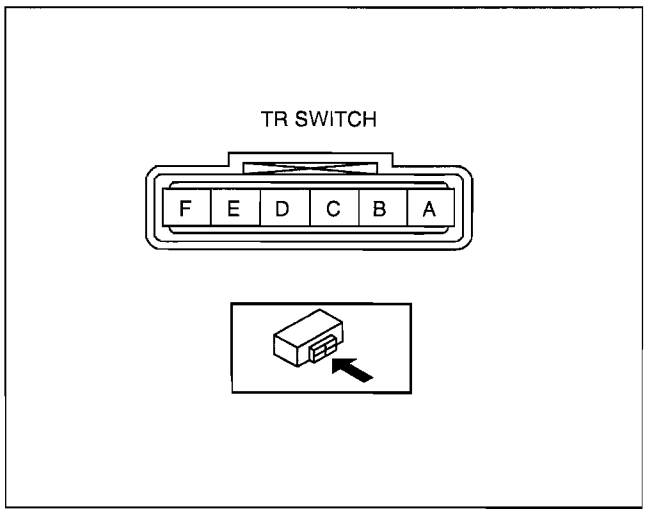
Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the TR switch connector.



d6e517aw5004

5. Measure the resistance between the following terminals.
   - If there is any malfunction, inspect the ground, then perform the operating inspection.



A6E5614W010

Transaxle range (TR) switch

Terminal	Position/Range	Resistance (ohm)
B—C	P	4,085—4,515
	R	1,425—1,575
	N	713—788
	D	371—409

6. Connect the TR switch connector.
7. Install the under cover.
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL]

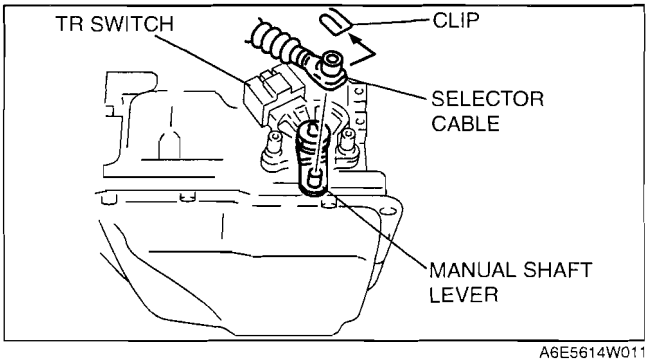
id051721804000

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.

Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

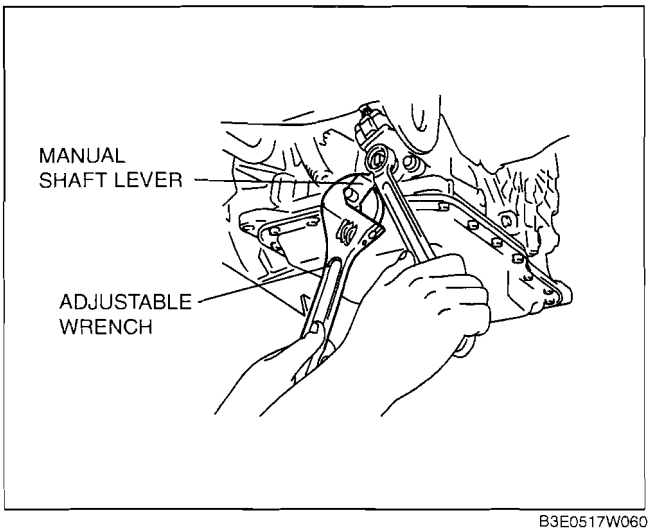
4. Disconnect the TR switch connector.
5. Remove the clip and disconnect the selector cable.

Caution
- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**



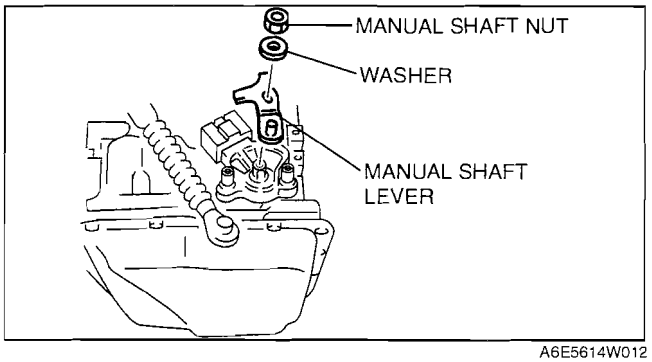
A6E5614W011

6. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.
7. Remove the manual shaft nut and washer.



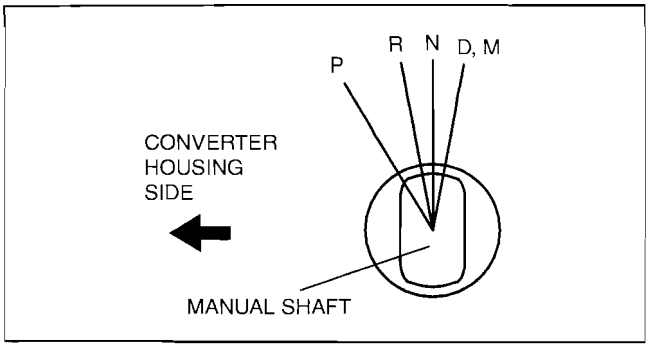
B3E0517W060

8. Remove the manual shaft lever.
9. Remove the TR switch.



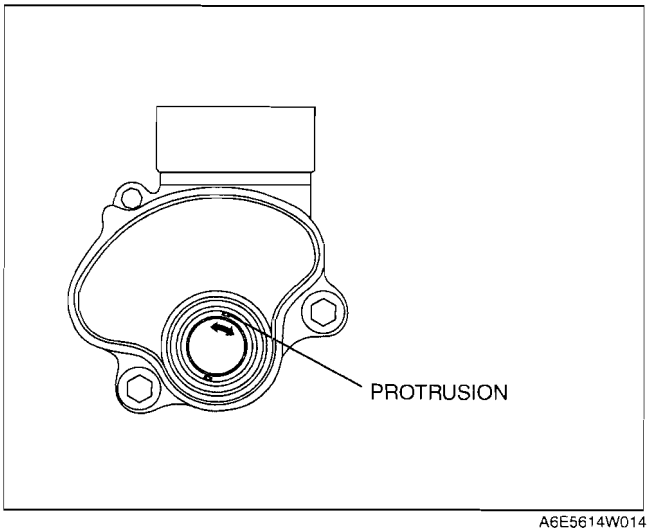
A6E5614W012

10. Rotate the manual shaft to the converter housing side fully, then return two notches to set the N position.

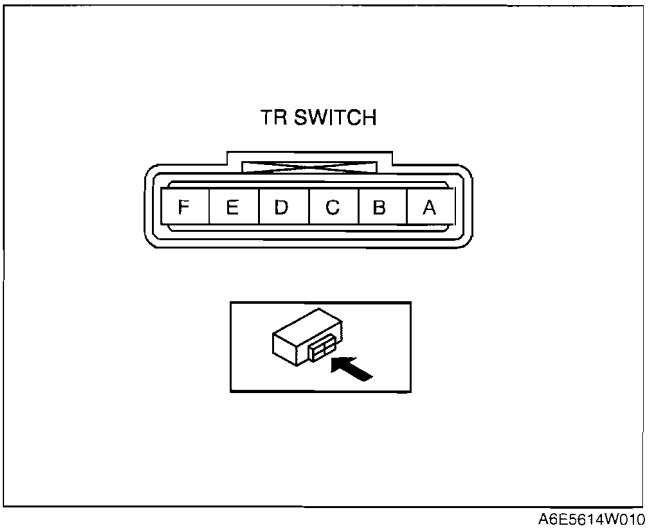


c3u0517w095

11. Turn the protrusion between the TR switch terminals B and C until the resistance becomes **750 ohms**.

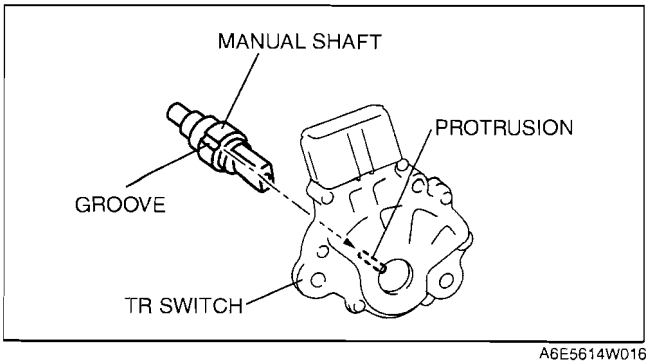


A6E5614W014



A6E5614W010

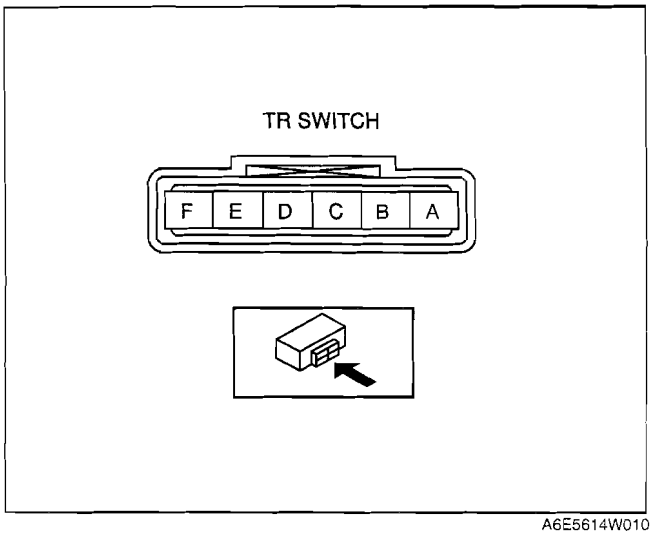
12. Install the TR switch while aligning the protrusion and groove as shown in the figure.
13. Hand-tighten the TR switch mounting bolts.



A6E5614W016

14. Inspect the resistance between the TR switch terminals B and C.
    - If there is any malfunction, readjust the TR switch. (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)

    Resistance
    750 ohms



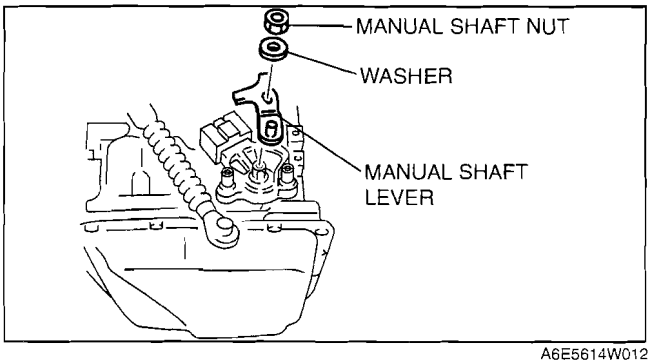
A6E5614W010

15. Tighten the TR switch mounting bolts.

    Tightening torque
    8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

    Caution
    - **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**

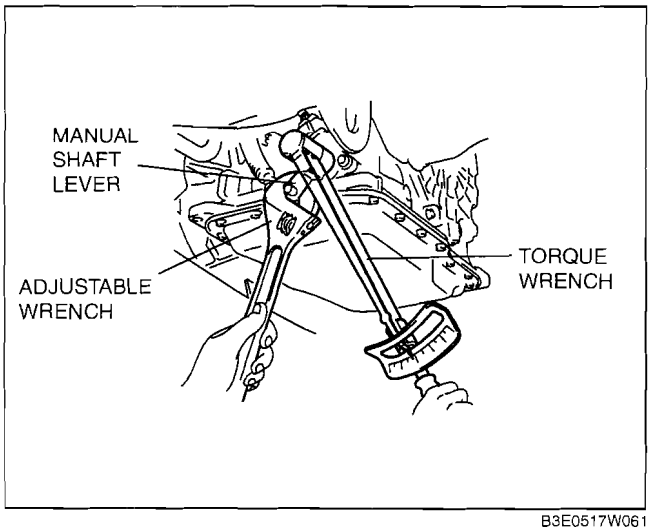
16. Install the manual shaft lever and the washer.



A6E5614W012

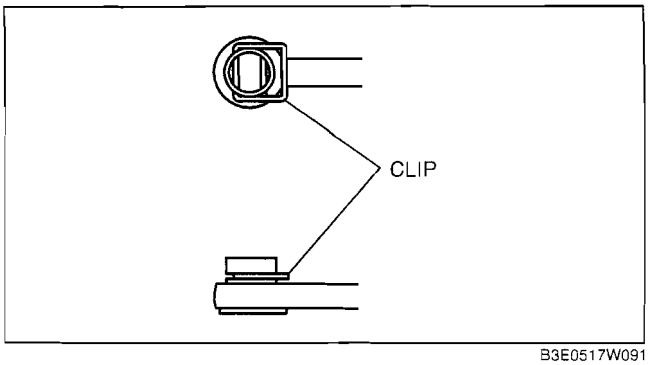
17. Set the adjustable wrench as shown in the figure to hold the manual shaft lever, and tighten the manual shaft nut.

    Tightening torque
    31.4—46.1 N·m
    {3.2—4.7 kgf·m, 23.2—33.9 ft·lbf}



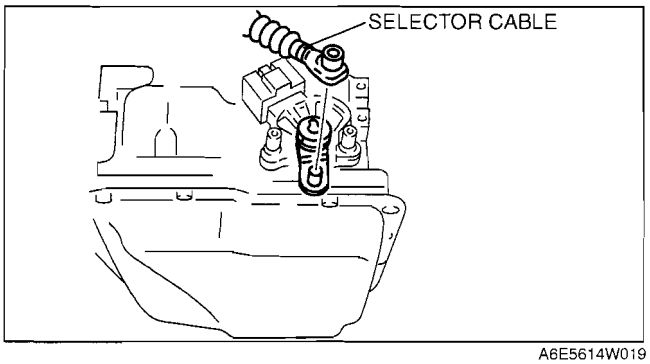
B3E0517W061

18. Install the clip to the selector cable as shown in the figure.
19. Shift the selector lever to P position.
20. Turn the manual shaft lever to P position.



B3E0517W091

21. Connect the selector cable.
22. Inspect for continuity at the TR switch. (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)
    - If there is any malfunction, readjust the TR switch. (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)
23. Connect the TR switch connector.
24. Install the under cover.
25. Connect the negative battery cable.
26. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



A6E5614W019

27. Inspect operation of the TR switch. (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)
    - If there is any malfunction, readjust the TR switch. (See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)

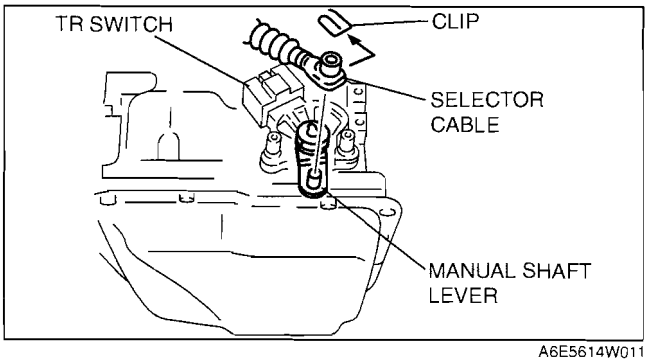
TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL]

id051721803700

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.

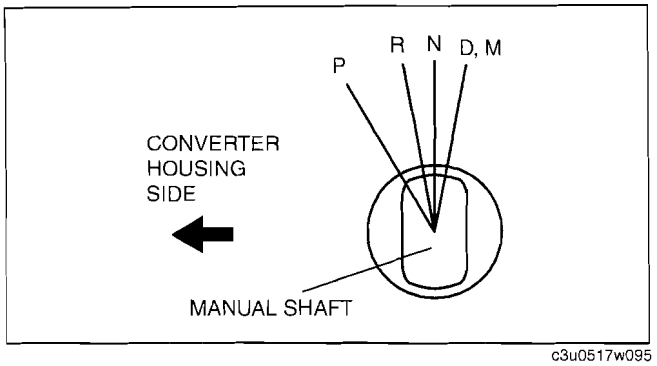
Caution
- **Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.**

4. Remove the clip and disconnect the selector cable.



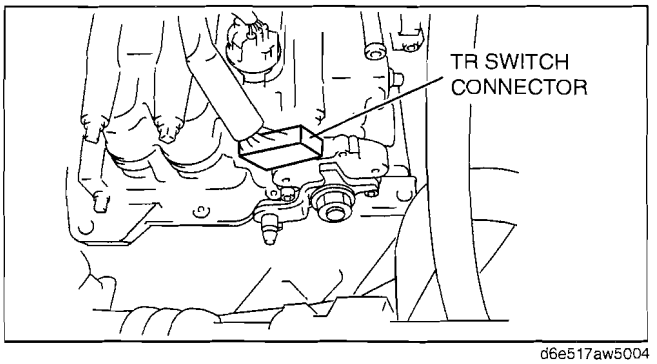
A6E5614W011

5. Rotate the manual shaft to the converter housing side fully, then return two notches to set the N position.



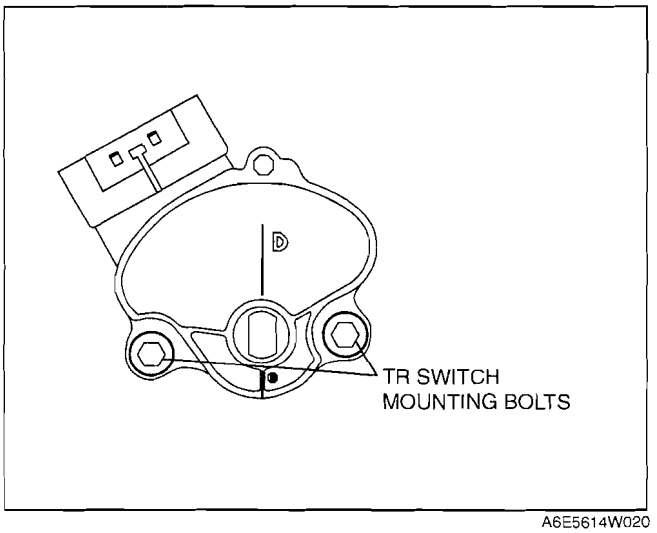
c3u0517w095

6. Disconnect the TR switch connector.



d6e517aw5004

7. Loosen the TR switch mounting bolts.



A6E5614W020

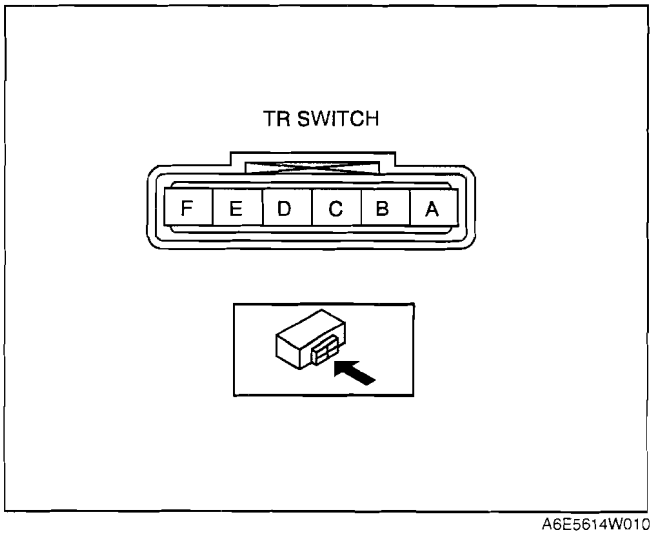
8. Measure the resistance between the TR switch terminals B and C.
9. Adjust the switch to the point as follows.

Resistance
750 ohms

10. Tighten the TR switch mounting bolts.

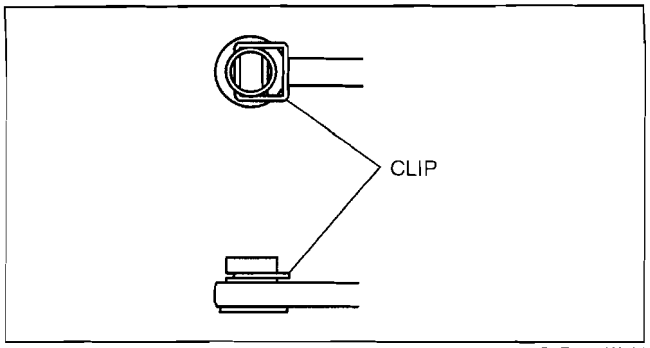
Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

11. Move the selector lever to N position.
12. Verify that the TR switch is aligned with N position.
13. Connect the TR switch connector.



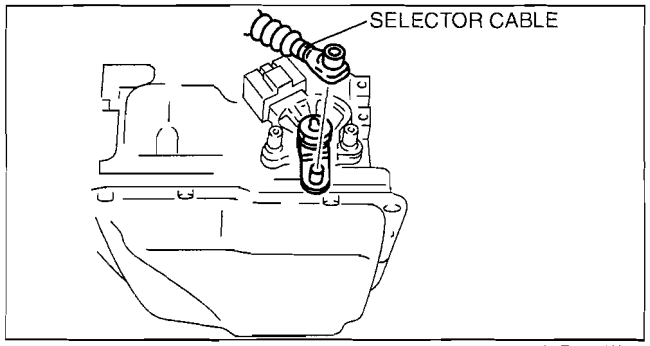
A6E5614W010

14. Install the clip to the selector cable as shown in the figure.



B3E0517W091

15. Connect the selector cable to the manual shaft lever as shown in the figure.
16. Inspect the TR switch operation. (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].)
    - If there is any malfunction, readjust the TR switch.
17. Install the under cover.
18. Connect the negative battery cable.
19. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



A6E5614W019

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION[FS5A-EL]

id051721801000

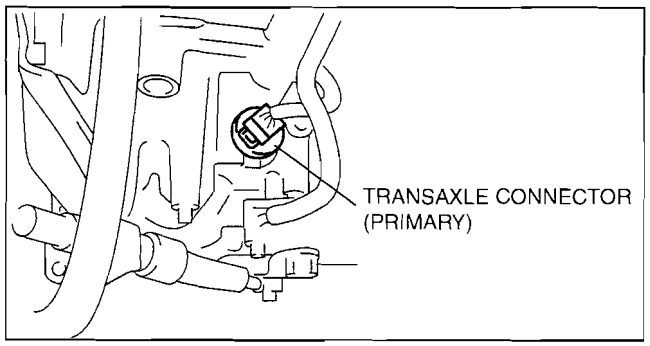
On-Vehicle Inspection

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)

Caution

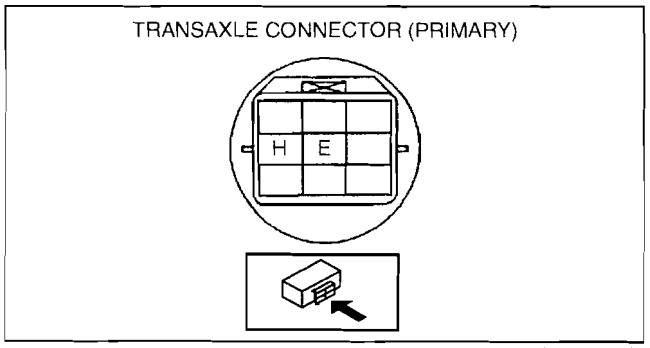
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

4. Disconnect the transaxle connector (primary).



d6e517aw5008

5. Measure the resistance between the terminals E and H.
    - If it is out of specification, perform the off-vehicle inspection of TFT sensor. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)



d6e517aw5009

Transaxle fluid temperature (TFT) sensor

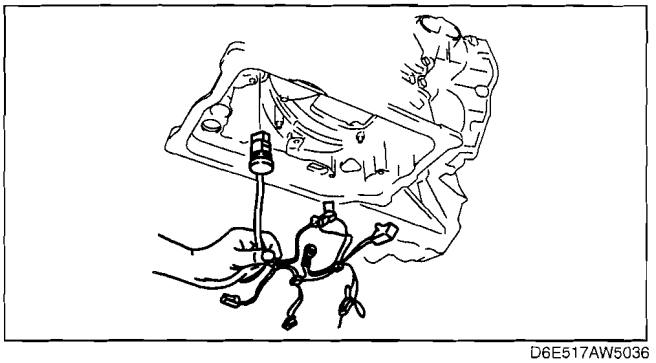
ATF temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

6. Install the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
7. Connect the negative battery cable.
8. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Off-Vehicle Inspection

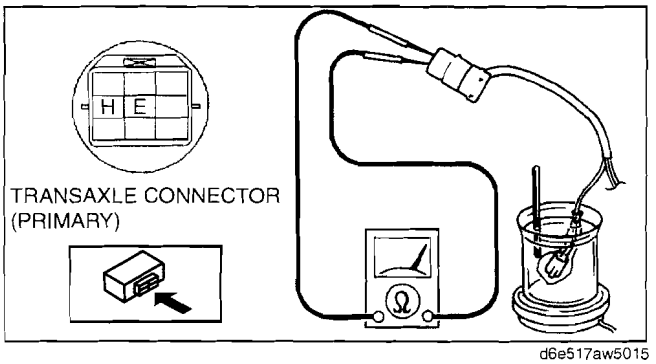
Warning
- **When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing ATF.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the coupler component. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
4. Place the TFT sensor and a thermometer in ATF as shown, and heat the ATF gradually.



D6E517AW5036

5. Measure resistance between the terminals of the TFT sensor.
   - If not as specified, replace the TFT sensor. (See 05-17B-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL].)



d6e517aw5015

Transaxle fluid temperature (TFT) sensor

ATF temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

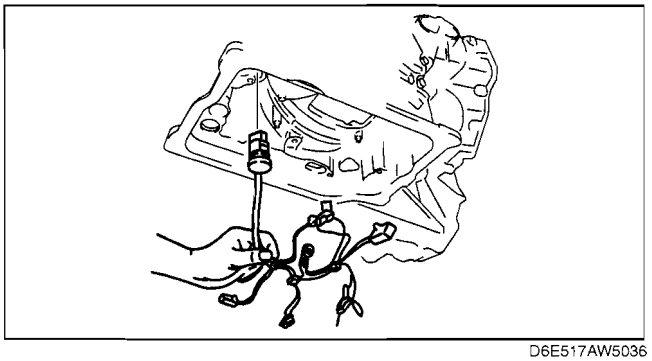
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION[FS5A-EL]

id051721801100

Warning

- **When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing the ATF.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Drain the ATF.
5. Remove the oil pan.
6. Remove the primary control valve body. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
7. Remove the coupler component.
8. Install the coupler component.
9. Install the primary control valve body. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
10. Install the oil pan. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
11. Install the under cover.
12. Connect the negative battery cable.
13. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
14. Add ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
15. Perform the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)
16. Perform the road test. (See 05-17B-6 ROAD TEST[FS5A-EL].)



D6E517AW5036

OIL PRESSURE SWITCH INSPECTION[FS5A-EL]

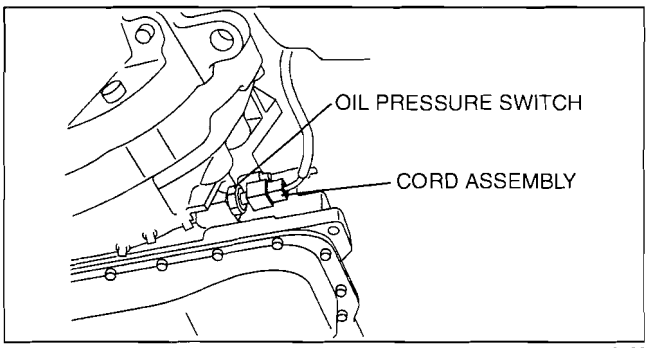
id051721805900

Caution

- **Water or foreign objects entering the connector can cause poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

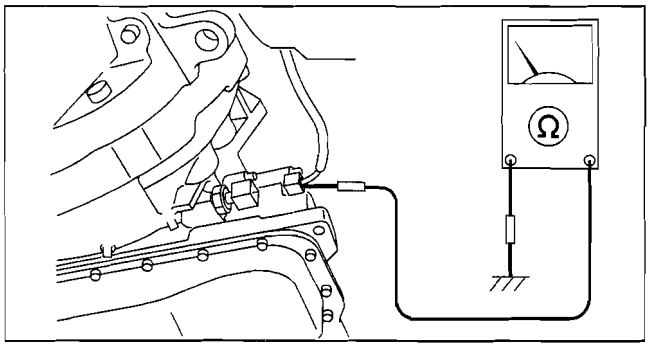
On-vehicle Inspection (harness inspection)

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the cord assembly connector.



am3uuw0000103

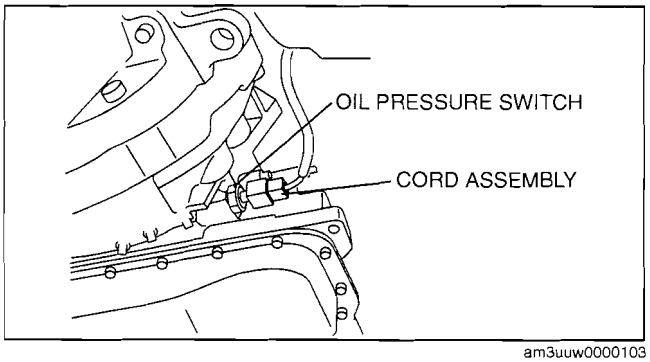
5. Verify that there is no continuity between cord assembly terminal and ground.
   - If as continuity, inspect the cord assembly.
   - If the cord assembly is okay, inspect the oil pressure switch. (See 05-17B-22 On-vehicle Inspection (oil pressure switch inspection).)
6. Connect the cord assembly connector.
7. Install the under cover.
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



am3uuw0000103

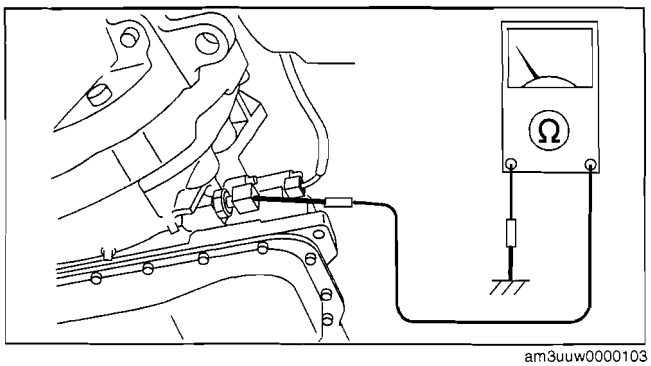
On-vehicle Inspection (oil pressure switch inspection)

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the cord assembly connector.
5. Start the engine, with gear position in N or P.
6. Reaffirm that there is no continuity between cord assembly terminal and ground.
7. Firmly depress the brake pedal with the left foot.
8. Shift the selector lever to D range.



am3uuw0000103

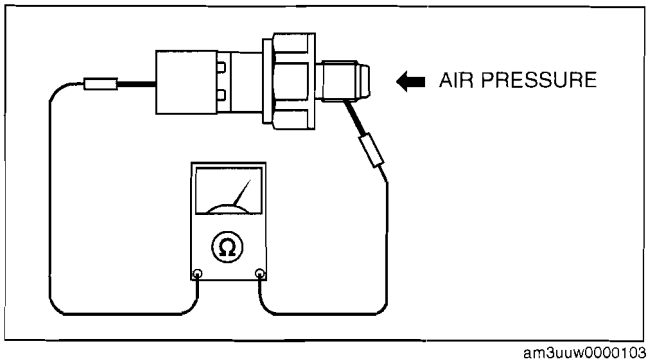
9. Verify that there is continuity between oil pressure switch terminal and ground.
   - If not as specified, replace the oil pressure switch. (See 05-17B-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
10. Connect the oil pressure switch connector.
11. Install the under cover.
12. Connect the negative battery cable.
13. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



am3uuw0000103

Off-vehicle inspection

1. Remove the oil pressure switch.
2. Apply air pressure at **400—440 kPa {4.1—4.4 kgf/cm^2,58—63 psi}**
3. Inspect continuity the between oil pressure switch terminal and screw part.
   - If not as continuity, replace the oil pressure switch. (See 05-17B-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
4. Install the oil pressure switch.



am3uuw0000103

OIL PRESSURE SWITCH REMOVAL/INSTALLATION[FS5A-EL]

id051721806000

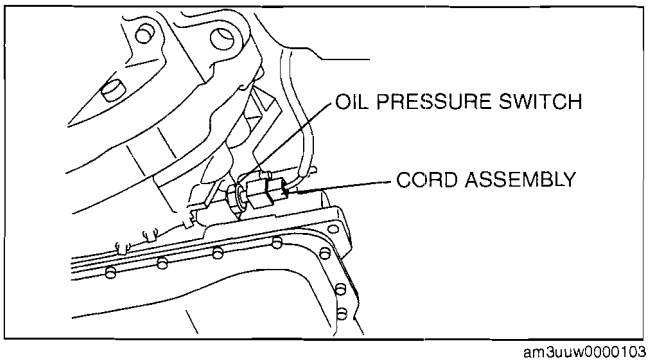
Warning

- **When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing ATF.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the cord assembly connector.
5. Remove the oil pressure switch.
6. Install the oil pressure switch.

Tightening torque
17.1—22.1N·m {1.75—2.25 kgf·m, 13—16 ft·lbf}

7. Connect the oil pressure switch connector.
8. Install the under cover.
9. Connect the negative battery cable.
10. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



am3uuw0000103

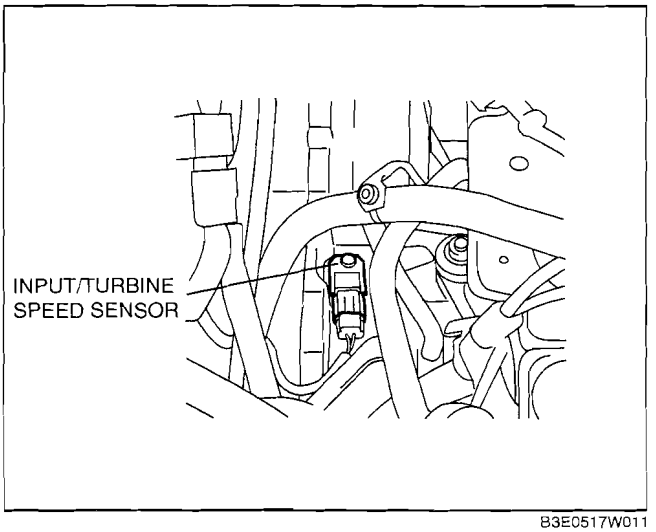
INPUT/TURBINE SPEED SENSOR INSPECTION[FS5A-EL]

id051721801200

Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

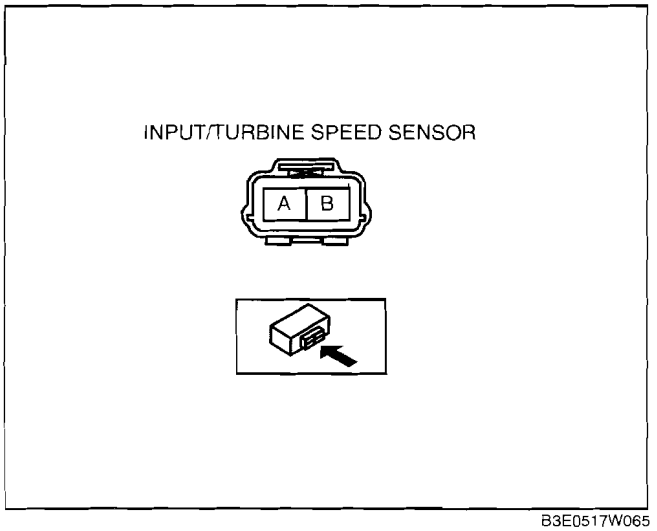
1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
5. Disconnect the input/turbine speed sensor connector.



B3E0517W011

6. Measure resistance between the terminals of the input/turbine speed sensor.
   - If not as specified, replace the input/turbine speed sensor.

   Input/turbine speed sensor resistance
   250—600 ohms (ATF temperature: –40—160 °C {–40—320 °F})



B3E0517W065

7. Connect the input/turbine speed sensor connector.
8. Install the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
9. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
10. Connect the negative battery cable.
11. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

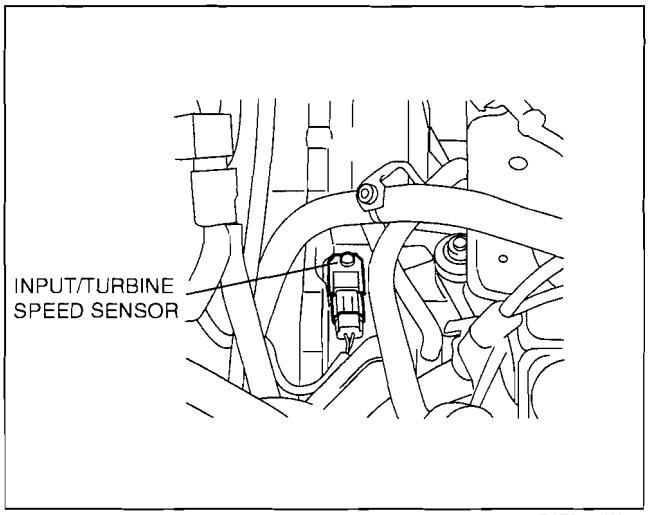
INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION[FS5A-EL]

id051721801300

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
5. Disconnect the input/turbine speed sensor connector.
6. Remove the input/turbine speed sensor.
7. Apply ATF to a new O-ring and install it on a new input/turbine speed sensor.
8. Install the input/turbine speed sensor.

   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

9. Connect the input/turbine speed sensor connector.
10. Install the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
11. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
12. Connect the negative battery cable.
13. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



B3E0517W011

INTERMEDIATE SENSOR INSPECTION[FS5A-EL]

id051721807100

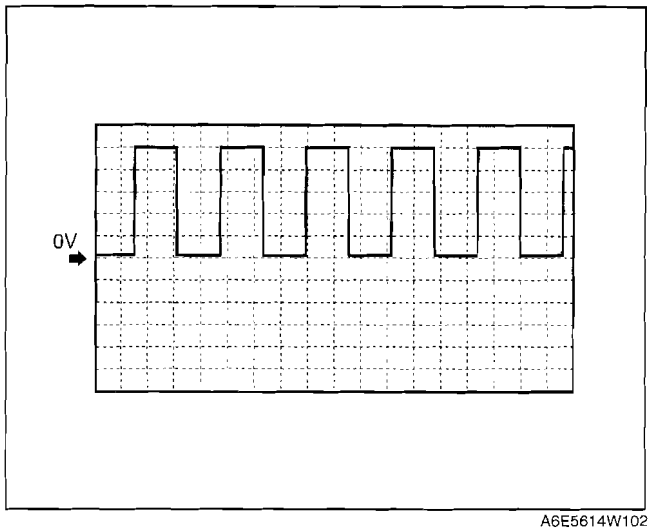
1. Connect the M-MDS, drive the vehicle, and verify the input value of the ISS PID.
   - If the input value is 0 rpm, perform the "Power Supply Voltage Inspection", "Open Circuit Inspection", or "Short Circuit Inspection".
   - If the input value is other than 0 rpm, perform the "Visual Inspection" or "Wave Profile Inspection".

Visual Inspection

1. Remove the intermediate sensor. (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
2. Make sure that the sensor is free of any metallic shavings or particles.
   - If any are found on the sensor, clean them off.
3. Install the intermediate sensor. (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL].)

Wave profile Inspection

1. Remove the TCM. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
2. Connect M-MDS to DLC connector.
3. Connect oscilloscope test leads to the following TCM connector terminals.
   - (+) lead: TCM terminal AC
   - (-) lead: TCM terminal M
4. Start the engine.
5. Monitor VSS PID.
6. Inspect wave profile.
   - TCM terminal: AC (+) - M (-)
   - Oscilloscope setting: 1 V/DIV (Y), 2.5 ms/DIV (X), DC range
   - Vehicle condition: drive the vehicle with 32 km/h{20 mph}
     — If wave profile or voltage are out of specifications, carry out the "Open Circuit Inspection" or "Short Circuit Inspection"



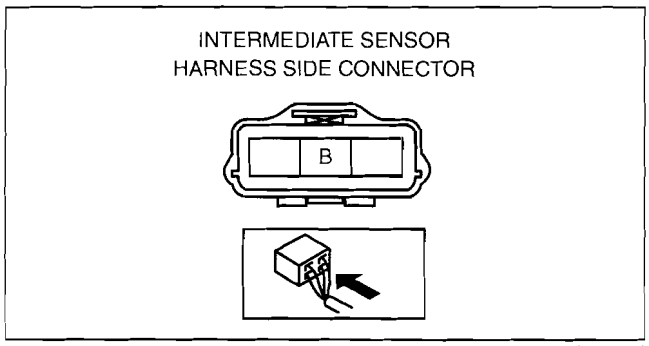
A6E5614W102

Power Supply Voltage Inspection

1. Disconnect the intermediate sensor connector.
2. Turn the ignition switch to ON.
3. Measure voltage at intermediate sensor connector terminal B (wiring harness side).

   Intermediate sensor voltage
   4.5—5.5 V

   - If voltage is okay, go to Open Circuit Inspection and Short Circuit Inspection.
   - If voltage is wrong, repair wiring harness between intermediate sensor and TCM.



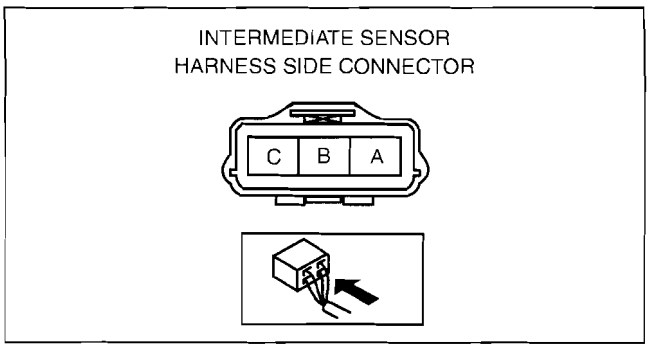
d6e517aw5013

Open Circuit Inspection

1. Inspect the following circuit for open.
   - Power circuit (intermediate sensor connector terminal A to main relay terminal D)
   - Ground circuit (intermediate sensor connector terminal C to GND)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.

Short Circuit Inspection

1. Inspect the following circuit for short.
   - Power circuit (intermediate sensor connector terminal A to main relay terminal D)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.



d6e517aw5014

Secondary Gear Inspection

1. Remove the intermediate sensor. (See 05-17B-27 INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL].)
2. Shift the selector lever to N position.
3. Inspect secondary gear surface via intermediate sensor installation hole while rotating the front tire manually.
   (1) Is secondary gear free of damage and cracks?
   (2) Is secondary gear free of any metallic shavings or particles?
      - If secondary gear is okay, replace the intermediate sensor.
      - If there is a problem, clean or replace the secondary gear.

INTERMEDIATE SENSOR REMOVAL/INSTALLATION[FS5A-EL]

id051721807200

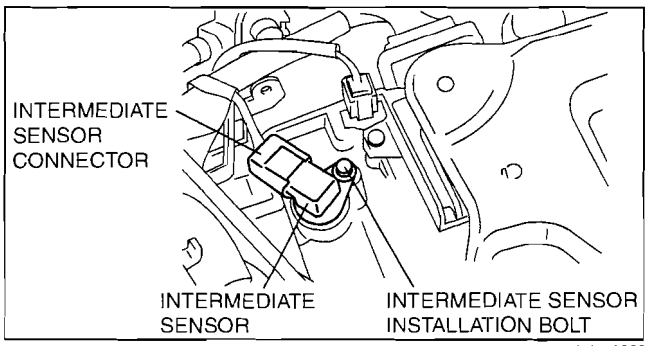
Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**
- **If foreign materials are stuck to the intermediate sensor, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the intermediate sensor during installation.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the intermediate sensor connector.
5. Remove the intermediate sensor.
6. Apply ATF to a new O-ring and install it on a new intermediate sensor.
7. Install the intermediate sensor.

   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

8. Connect the intermediate sensor connector.
9. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
10. Connect the negative battery cable.
11. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



e3u517bw6008

VEHICLE SPEED SENSOR (VSS) INSPECTION[FS5A-EL]

id051721801400

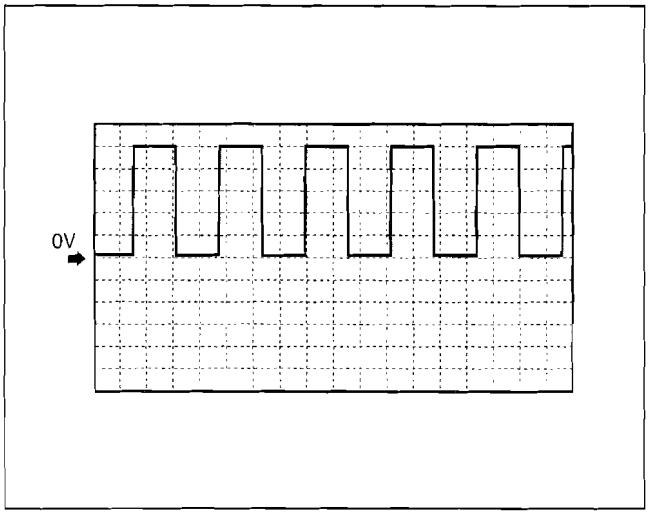
1. Connect the M-MDS, drive the vehicle, and verify the input value of the OSS PID.
   - If the input value is 0 rpm, perform the "Power Supply Voltage Inspection", "Open Circuit Inspection", or "Short Circuit Inspection".
   - If the input value is other than 0 rpm, perform the "Visual Inspection" or "Wave Profile Inspection".

Visual Inspection

1. Remove the VSS. (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)
2. Make sure that the sensor is free of any metallic shavings or particles.
   - If any are found on the sensor, clean them off.
3. Install the VSS. (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)

Wave profile Inspection

1. Remove the TCM. (See 05-17B-42 TCM REMOVAL/INSTALLATION[FS5A-EL].)
2. Connect M-MDS to DLC connector.
3. Connect oscilloscope test leads to the following TCM connector terminals.
   - (+) lead: TCM terminal Z
   - (-) lead: TCM terminal M
4. Start the engine.
5. Monitor VSS PID.
6. Inspect wave profile.
   - TCM terminal: Z (+) - M (-)
   - Oscilloscope setting: 1 V/DIV (Y), 2.5 ms/DIV (X), DC range
   - Vehicle condition: drive the vehicle with 32 km/h{20 mph}
     — If wave profile or voltage are out of specifications, carry out the "Open Circuit Inspection" or "Short Circuit Inspection"



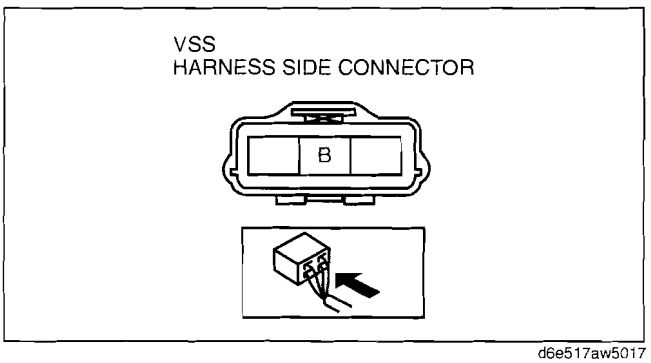
A6E5614W102

Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to ON.
3. Measure voltage at VSS connector terminal B (wiring harness side).

Vehicle speed sensor (VSS) voltage
4.5—5.5 V

- If voltage is okay, go to Open Circuit Inspection and Short Circuit Inspection.
- If voltage is wrong, repair wiring harness between VSS and TCM.



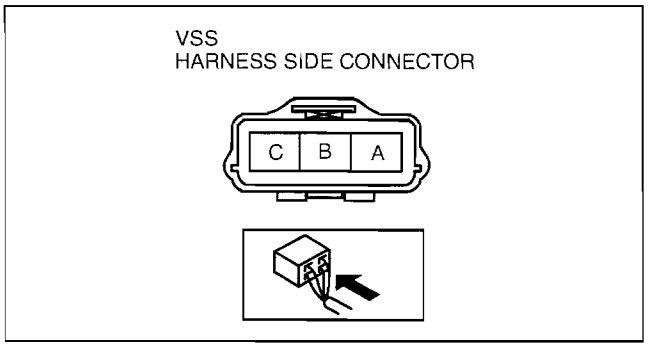
d6e517aw5017

Open Circuit Inspection

1. Inspect the following circuit for open.
   - Power circuit (VSS connector terminal A to main relay terminal D)
   - Ground circuit (VSS connector terminal C to GND)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.

Short Circuit Inspection

1. Inspect the following circuit for short.
   - Power circuit (VSS connector terminal A to main relay terminal D)
   - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
   - If there are no open or short circuits, perform the sensor rotor inspection.



d6e517aw5018

Sensor Rotor Inspection

1. Remove the VSS. (See 05-17B-29 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL].)
2. Shift the selector lever to N position.
3. Inspect sensor rotor surface via VSS installation hole while rotating the front tire manually.
   (1) Is sensor rotor free of damage and cracks?
   (2) Is sensor rotor free of any metallic shavings or particles?
      - If sensor rotor is okay, replace the VSS.
      - If there is a problem, clean or replace the sensor rotor.

VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[FS5A-EL]

id051721806100

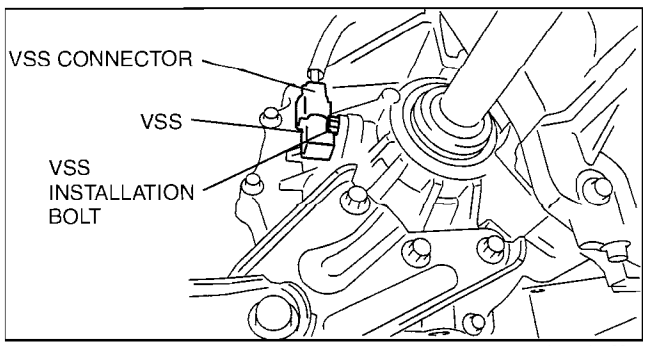
Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**
- **If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Disconnect the VSS connector.
5. Remove the VSS.
6. Apply ATF to a new O-ring and install it on a new VSS.
7. Install the VSS.

   Tightening torque
   8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

8. Connect the VSS connector.
9. Install the under cover.
10. Connect the negative battery cable.
11. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)



e3u517bw6010

SOLENOID VALVE INSPECTION (PRIMARY CONTROL VALVE BODY)[FS5A-EL]

id051721807700

Resistance Inspection (On-Vehicle Inspection)

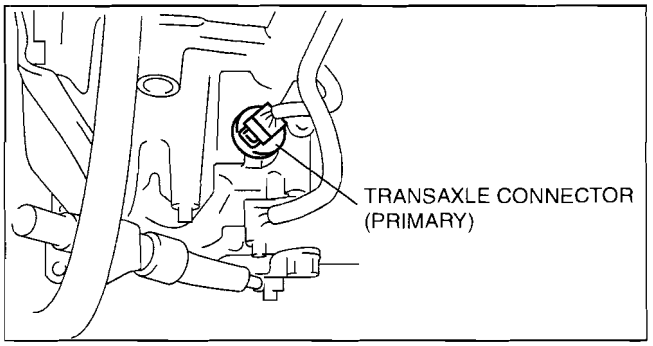
Caution

- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the transaxle connector (primary).

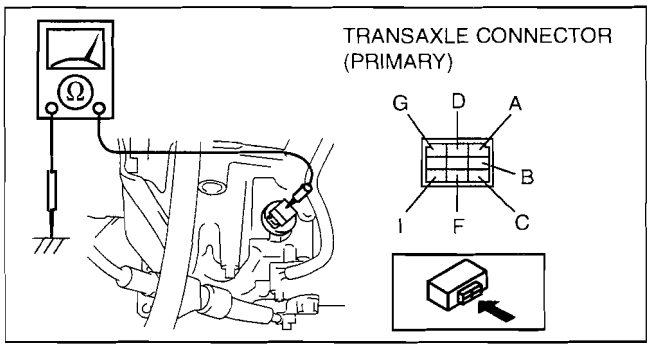
Note

- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (terminal I) of the pressure control solenoid inside the solenoid valve connector.



d6e517aw5008

5. Measure the resistance between the following terminals.
   - If not as specified, inspect the ground, then perform the operating inspection.



d6e517aw5020

Primary control valve body (ATF temperature: –40—150 °C {–40—302 °F})

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Shift solenoid A	1.0—4.2
C—GND	Shift solenoid B	1.0—4.2
G—GND	Shift solenoid C	1.0—4.2
B—GND	Shift solenoid D	10.9—26.2
F—GND	Shift solenoid E	10.9—26.2
D—I	Pressure control solenoid A	2.4—7.3

6. Connect the transaxle connector (primary).
7. Install the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Operating Inspection

1. Disconnect the transaxle connector (primary).

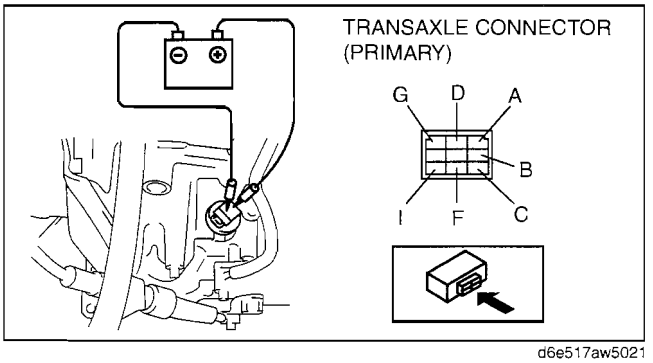
Caution

- **Do not apply battery position voltage to terminals A, B, C, D, F and G for more than three seconds.**

Note

- Because the operation sound of the valves is small, perform inspection in a quiet place.

2. Apply battery positive voltage to terminals A,B,C, F or G and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
     — If there is a problem, repair or replace the transaxle harness.
3. Apply battery positive voltage to terminal D and battery negative voltage to terminal I, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If transaxle harness is okay, perform the resistance inspection (off-vehicle inspection)
     — If there is a problem, repair or replace the transaxle harness.



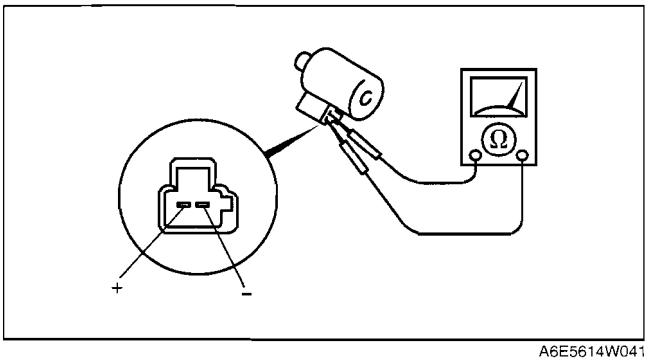
d6e517aw5021

Resistance Inspection (Off-Vehicle Inspection)

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the solenoid valve(s). (See 05-17B-32 SOLENOID VALVE REMOVAL/INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
4. Measure the resistance of each solenoid valve individually.
   - If not as specified, replace the solenoid valve.
5. Install the solenoid valve(s). (See 05-17B-32 SOLENOID VALVE REMOVAL/INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL].)
6. Connect the negative battery cable.
7. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Pressure control solenoid A

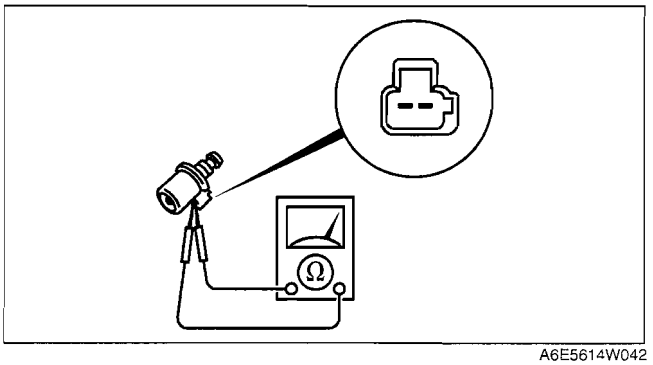
Resistance
2.4—7.3 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



A6E5614W041

Shift solenoid A, B, C

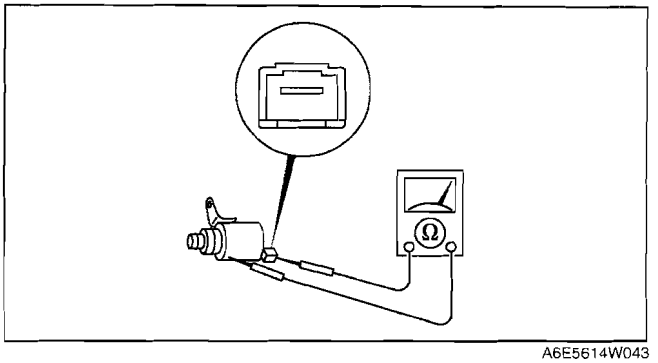
Resistance
1.0—4.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



A6E5614W042

Shift solenoid D, E

Resistance
10.9—26.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})

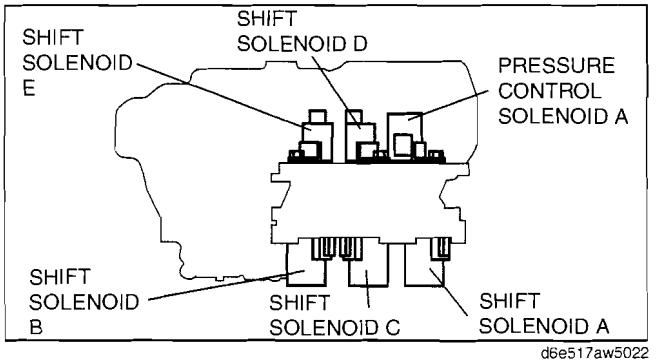


A6E5614W043

SOLENOID VALVE REMOVAL/INSTALLATION (PRIMARY CONTROL VALVE BODY)[FS5A-EL]

id051721807800

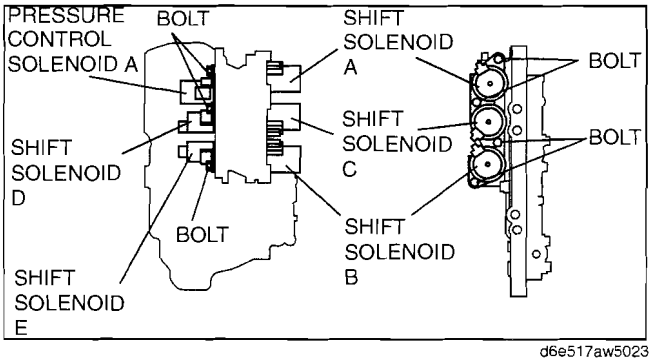
1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the under cover.
4. Drain the ATF.
5. Remove the oil pan.
6. Remove the primary control valve body. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
7. Remove the solenoid valve(s).
8. Apply ATF to a new O-ring and install it on the solenoid valve.



d6e517aw5022

9. Install the solenoid valve in the primary control valve body.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 70—95.4 in·lbf}



d6e517aw5023

10. Install the primary control valve body. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
11. Install the oil pan. (See 05-17B-51 PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
12. Install the under cover.
13. Connect the negative battery cable.
14. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
15. Add ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
16. Perform the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)
17. Perform the road test. (See 05-17B-6 ROAD TEST[FS5A-EL].)

SOLENOID VALVE INSPECTION (SECONDARY CONTROL VALVE BODY)[FS5A-EL]

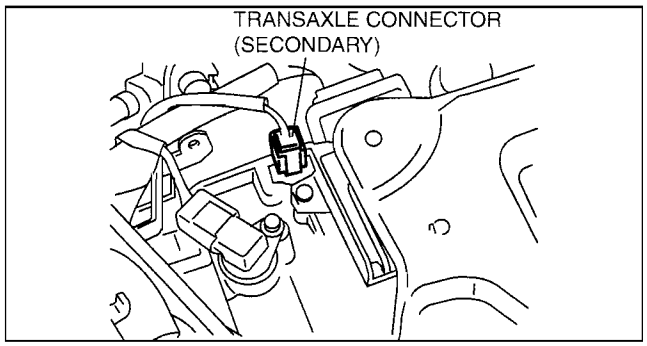
id051721807900

Resistance Inspection (On-Vehicle Inspection)

Caution
- **Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.**

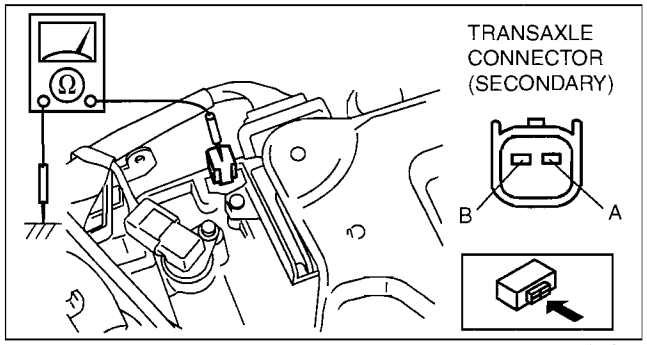
1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Disconnect the transaxle connector (secondary).

Note
- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (terminal I) of the pressure control solenoid inside the solenoid valve connector.



e3u517bw6006

5. Measure the resistance between the following terminals.
   - If not as specified, inspect the ground, then perform the operating inspection.



e3u517bw6007

Secondary control valve body (ATF temperature: –40—150 °C {–40—302 °F})

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Pressure control solenoid B	1.0—4.2
B—GND	Shift solenoid F	8.4—21.8

6. Connect the transaxle connector (secondary).
7. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Operating Inspection

1. Disconnect the transaxle connector (secondary).

Caution
- **Do not apply battery position voltage to terminals A and B for more than three seconds.**

Note
- Because the operation sound of the valves is small, perform inspection in a quiet place.

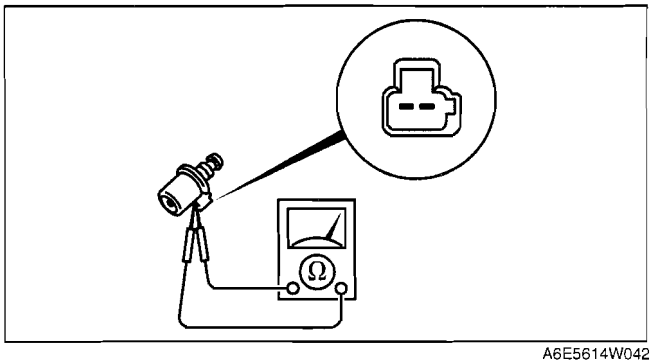
2. Apply battery positive voltage to terminals A and B and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
   - If the "click" is not heard, inspect the transaxle harness.
     — If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
     — If there is a problem, repair or replace the transaxle harness.

Resistance Inspection (Off-Vehicle Inspection)

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove the solenoid valve(s). (See 05-17B-34 SOLENOID VALVE REMOVAL/INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)
5. Measure the resistance of each solenoid valve individually.
   - If not as specified, replace the solenoid valve.
6. Install the solenoid valve(s). (See 05-17B-34 SOLENOID VALVE REMOVAL/INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL].)
7. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)

Pressure control solenoid B

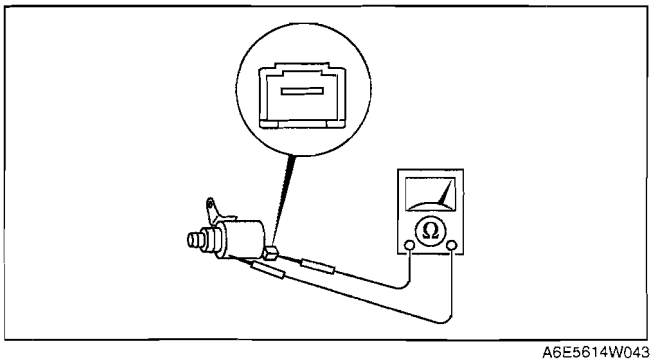
Resistance
1.0—4.2 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



A6E5614W042

Shift solenoid F

Resistance
8.4—21.8 ohms
(ATF temperature: –40—150 °C {–40—302 °F})



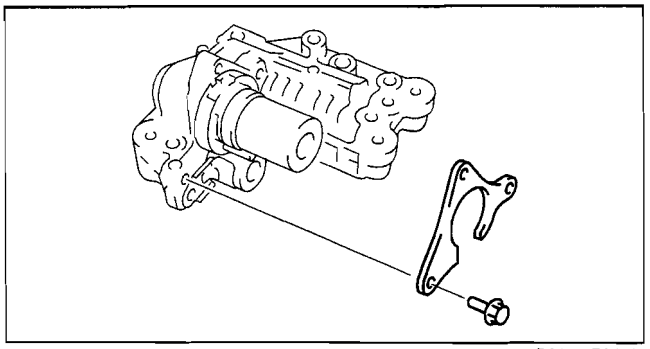
A6E5614W043

SOLENOID VALVE REMOVAL/INSTALLATION (SECONDARY CONTROL VALVE BODY)[FS5A-EL]

id051721808000

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove the under cover.
5. Drain the ATF.
6. Remove the oil cover.
7. Remove the secondary control valve body. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)

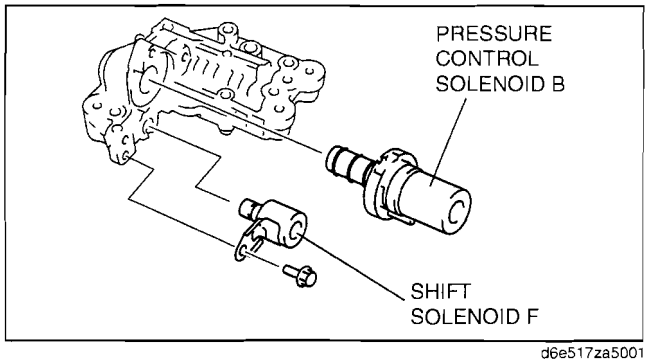
8. Remove the bracket.



D6J517ZA4115

9. Remove the solenoid valve(s).
10. Apply ATF to a new O-ring and install it on the solenoid valve.
11. Install the solenoid valve in the secondary control valve body.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 70—95.4 in·lbf}



d6e517za5001

12. Install the secondary control valve body. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
13. Install the oil cover. (See 05-17B-54 SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL].)
14. Install the under cover.
15. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
16. Connect the negative battery cable.
17. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
18. Add ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
19. Perform the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)
20. Perform the road test. (See 05-17B-6 ROAD TEST[FS5A-EL].)

TCM INSPECTION[FS5A-EL]

id051721800300

Caution

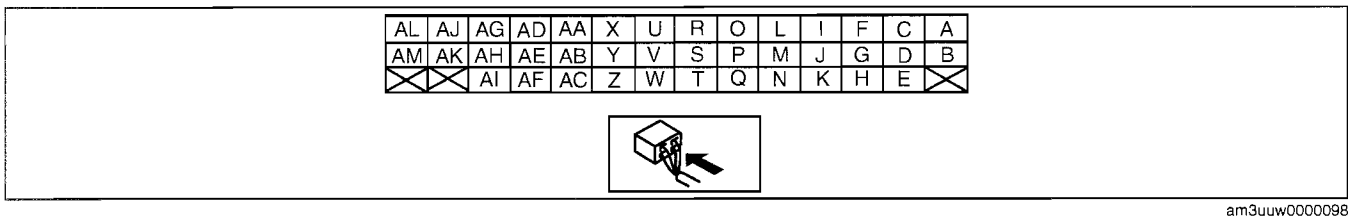
- **The TCM terminal voltages vary with changes in measuring and vehicle conditions. Always carry out a total inspection of the input and output systems, and the TCM to determine the cause of trouble. Otherwise, a mis-diagnosis could occur.**

1. Measure the voltage at each terminal.
   - If any incorrect voltage is detected, inspect the related system(s), wiring harnesses and connector(s) referring to the Action column in the terminal voltage table.

Terminal Voltage Table (Reference)

Note

- Use the ground of terminal L and M of the TCM when measuring terminal voltage, as an error may occur when connecting the negative circuit tester to ground.



am3uuw0000098

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
A	—	—	—		—	—
B	CAN_H	Instrument cluster, ABS HU/CM, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.			—
C	—	—	—		—	—
D	—	—	—		—	—
E	CAN_L	Instrument cluster, ABS HU/CM, ABS/TCS HU/CM, DSC HU/CM	Because this terminal is for CAN, adequate determination by terminal voltage is not possible.			—
F	Manual down	Down switch	Ignition switch ON	Detects down-shift operation of selector lever in M range	Below 1.0	• Inspect down switch (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
G	Manual up	Up switch	Ignition switch ON	Detects up-shift operation of selector lever in M range	Below 1.0	• Inspect up switch (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
H	—	—	—		—	—
I	B+	Main relay	Ignition switch OFF		Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON		B+	
J	Back-up power supply	Battery (positive terminal)	Under any condition		B+	• Inspect battery • Inspect related harness

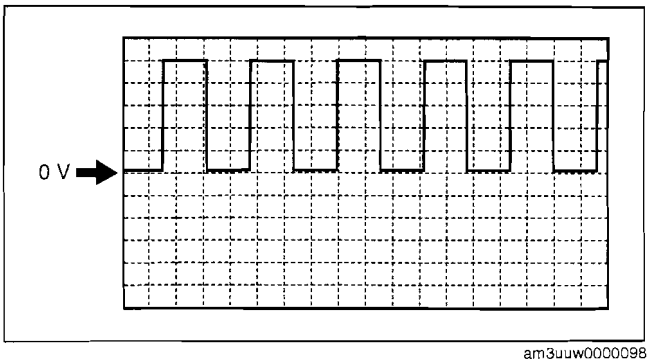
Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
K	M range	M range switch	Ignition switch ON	Manual mode	Below 1.0	• Inspect M range switch (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.) • Inspect related harness
				Other	B+	
L	GND	GND	Under any condition		Below 1.0	• Inspect related harness
M	GND	GND	Under any condition		Below 1.0	• Inspect related harness
N	—	—	—		—	—
O	B+	Main relay	Ignition switch OFF		Below 1.0	• Inspect battery • Inspect related harness
			Ignition switch ON		B+	
P	Main relay control	Main relay	Ignition switch OFF		B+	• Inspect main relay • Inspect related harness
			Ignition switch ON		Below 1.0	
Q	—	—	—		—	—
R	—	—	—		—	—
S	Oil pressure	Oil pressure switch	Ignition switch ON	Detects forward clutch pressure	Below 1.0	• Inspect oil pressure switch • Inspect related harness
T	—	—	—		—	—
U	Selector lever position	TR switch (terminal C)	Ignition switch ON	P position	Approx. 4.6	• Inspect TR switch (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].) • Inspect related harness
				R position	Approx. 3.9	
				N position	Approx. 3.2	
				D range M range	Approx. 2.5	
V	Sensor GND	MAF/IAT sensor, HO2S (front, rear), Variable resistor, ECT sensor, TP sensor, MAP sensor, TFT sensor, TR switch	Under any condition		Below 1.0	• Inspect related harness
W	Cruise control switch	Cruise control switch	Ignition switch to the ON position	ON/OFF switch pressed in	Approx. 0	• Cruise control switch • Inspect related harness
				CANCEL switch pressed in	Approx. 1.1	
				SET/COAST switch pressed in	Approx. 3.1	
				RES/ACCEL switch pressed in	Approx. 4.2	
				Except above	Approx. 5.0	
X	Cruise control switch GND	Cruise control switch	Under any condition		Below 1.0	• Inspect related harness
Y	Input/turbine speed sensor (–)	Input/turbine speed sensor	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect input/turbine speed sensor • Inspect related harness
Z	Vehicle speed	VSS	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect VSS • Inspect related harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
AA	ATF temperature	TFT sensor	Ignition switch ON	TFT 20 °C {68 °F}	Approx. 3.3	• Inspect TFT sensor • Inspect related harness
				TFT 40 °C {104 °F}	Approx. 2.4	
				TFT 60 °C {140 °F}	Approx. 1.5	
AB	Input/turbine speed sensor (+)	Input/turbine speed sensor	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect input/turbine speed sensor • Inspect related harness
AC	Secondary gear rotating speed	Intermediate sensor	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect intermediate sensor • Inspect related harness
AD	Pressure control solenoid A (+)	Pressure control solenoid A	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect pressure control solenoid A • Inspect related harness
AE	Pressure control solenoid A (−)	Pressure control solenoid A	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect pressure control solenoid A • Inspect related harness
AF	—	—	—		—	—
AG	Shift solenoid A control	Shift solenoid A	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect shift solenoid A • Inspect related harness
AH	Shift solenoid D control	Shift solenoid D	Selector lever is at P, N, D (2GR, 4GR, 5GR), M (1GR) position		B+	• Inspect shift solenoid D • Inspect related harness
			Other		Below 1.0	
AI	Shift solenoid F control	Shift solenoid F	1GR, 2GR, 3GR, 4GR		B+	• Inspect shift solenoid F • Inspect related harness
			5GR		Below 1.0	
AJ	Shift solenoid B control	Shift solenoid B	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect shift solenoid B • Inspect related harness
AK	Shift solenoid E control	Shift solenoid E	Detects TCC operation		B+	• Inspect shift solenoid E • Inspect related harness
			Other		Below 1.0	
AL	Shift solenoid C control	Shift solenoid C	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect shift solenoid C • Inspect related harness
AM	Pressure control solenoid B	Pressure control solenoid B	• Inspect using the wave profile. (See 05-17B-39 Inspection Using an Oscilloscope (Reference).)			• Inspect pressure control solenoid B • Inspect related harness

Inspection Using an Oscilloscope (Reference)
Secondary gear rotating speed signal
TCM terminals
- AC (+)—M (–)

Oscilloscope setting
- 1 V/DIV (Y), 2.5 ms/DIV (X), DC range

Vehicle condition
- Drive the vehicle at approx. 32 km/h {19.9 mph}

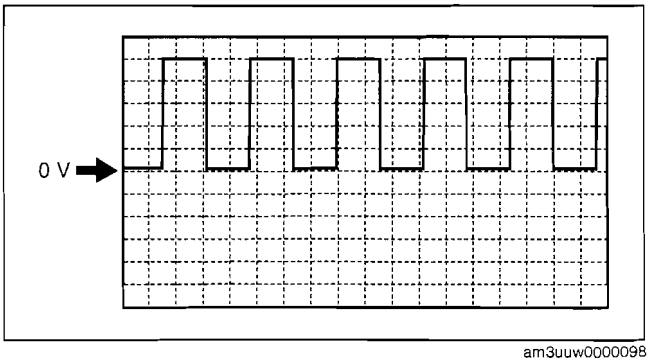


am3uuw0000098

VSS signal
TCM terminals
- Z (+)—M (–)

Oscilloscope setting
- 1 V/DIV (Y), 2.5 ms/DIV (X), DC range

Vehicle condition
- Drive the vehicle at approx. 32 km/h {19.9 mph}

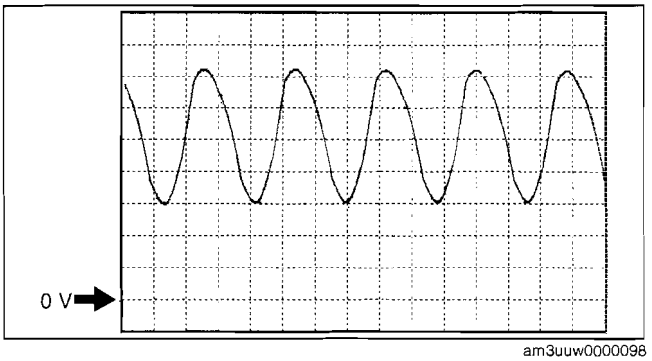


am3uuw0000098

Input/turbine speed sensor signal
TCM terminals
- AB (+)—M (–)

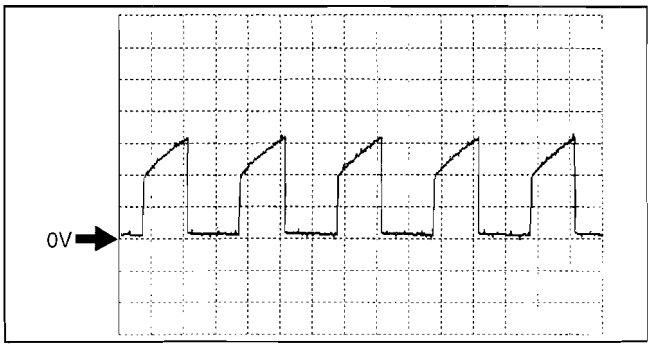
Oscilloscope setting
- 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)



am3uuw0000098

Pressure control solenoid A signal
(–)
TCM terminals
AE (+)—M (–)
Oscilloscope setting
200 mV/DIV (Y), 1 ms/DIV (X), DC range
Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

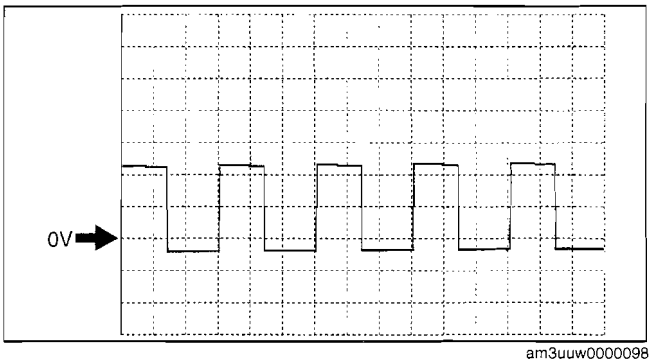


am3uuw0000098

(+)
TCM terminals
- AD (+)—M (–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up (engine speed approx. 700 rpm, no load, P/S off, A/C off)

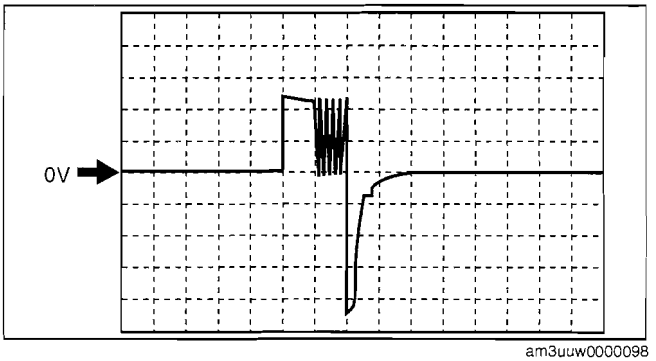


am3uuw0000098

Pressure control solenoid B signal
TCM terminals
- AM (+)—M (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 4GR→5GR, 5GR→4GR

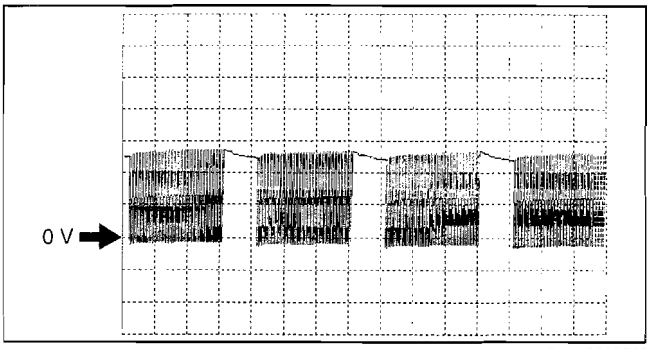


am3uuw0000098

Shift solenoid A control
TCM terminals
- AG (+)—M (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 4GR (D range)

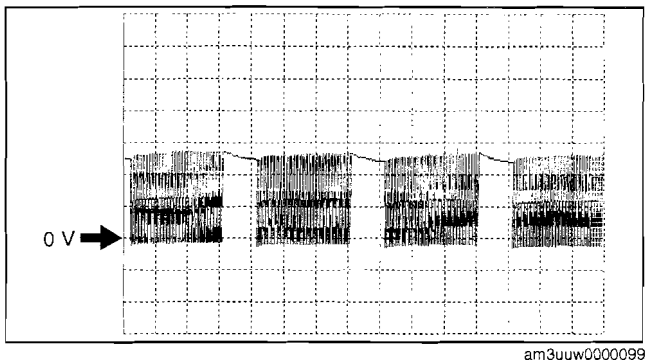


am3uuw0000098

Shift solenoid B control
TCM terminals
- AJ (+)—M (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 1GR (D range)

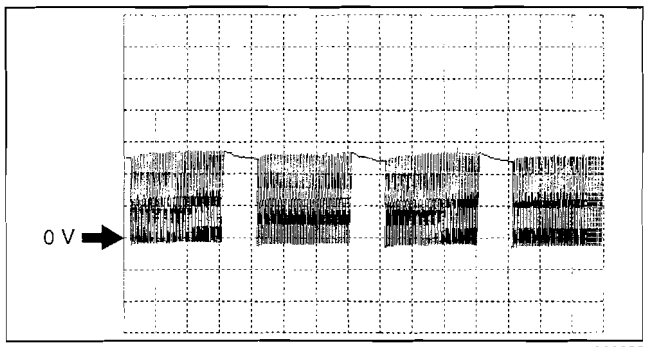


am3uuw0000099

Shift solenoid C control
TCM terminals
- AL (+)—M (–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- 1GR or 2GR



am3uuw0000099

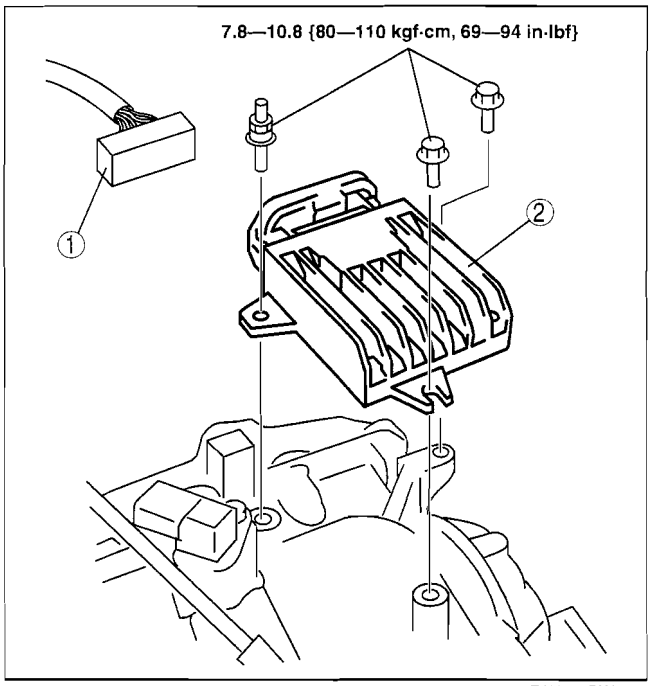
TCM REMOVAL/INSTALLATION[FS5A-EL]

id051721800400

Caution
- **Do not apply a shock to or touch the projection on the TCM, otherwise it may not operate normally.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.

1	TCM connector
2	TCM



E3U517BW6009

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL]

id051721802400

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the following parts.
   (1) Battery, battery tray and battery box. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
   (3) Exhaust manifold insulator.
   (4) Front tires and splash shield.
   (5) Under cover.
4. Drain the ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

Warning
- **Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.**

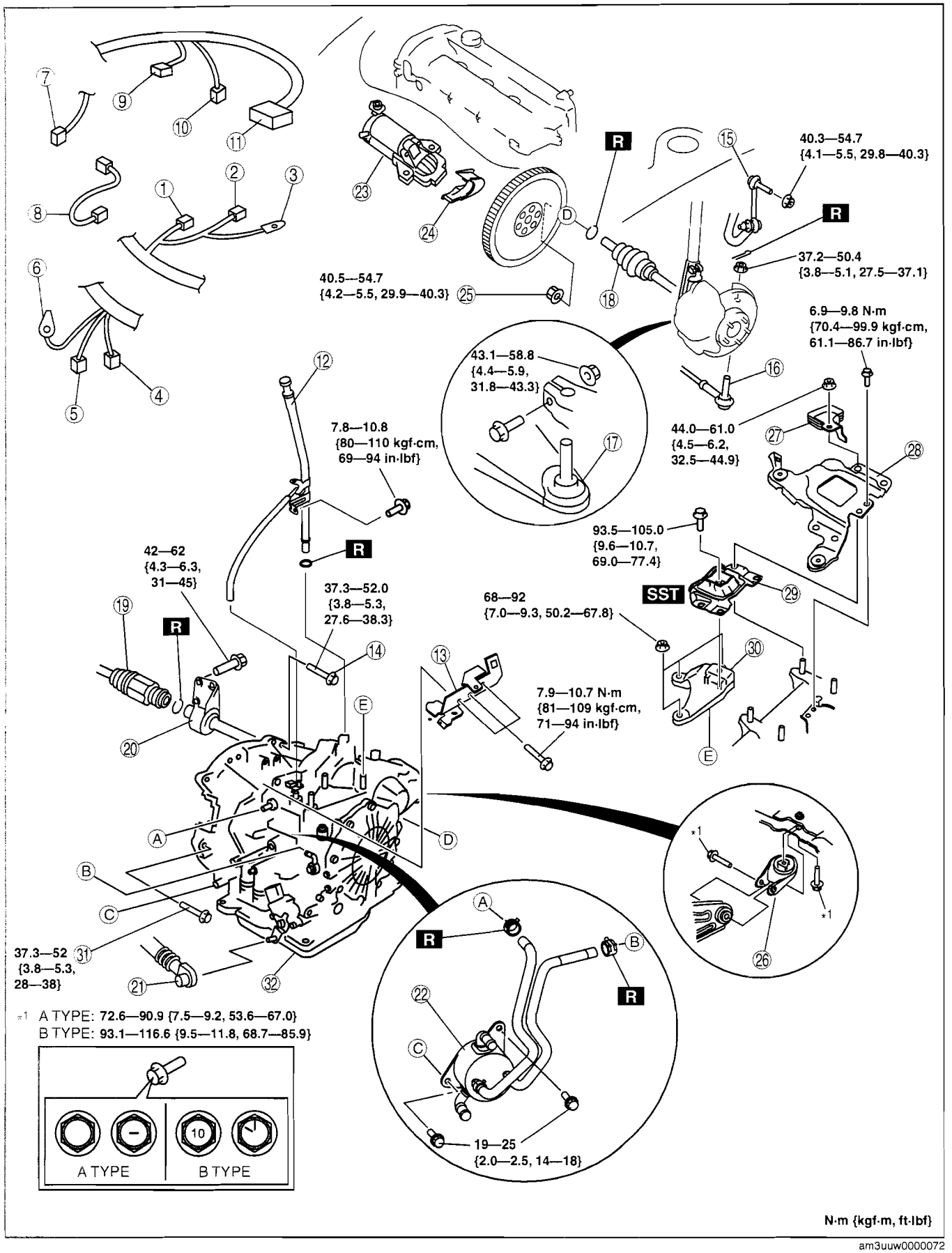
Caution
- **To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.**

5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Add ATF to the specified level. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

8. Perform the following test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].) (See 05-17B-6 ROAD TEST[FS5A-EL].)

Service item	Test item			
	Line pressure test	Stall test	Time lag test	Road test
ATX replacement	X			
ATX overhaul	X	X	X	X
Torque converter replacement	X	X		
Oil pump replacement	X			
Clutch system replacement	X		X	X

X : Test to be performed after the service work



am3uuw0000072

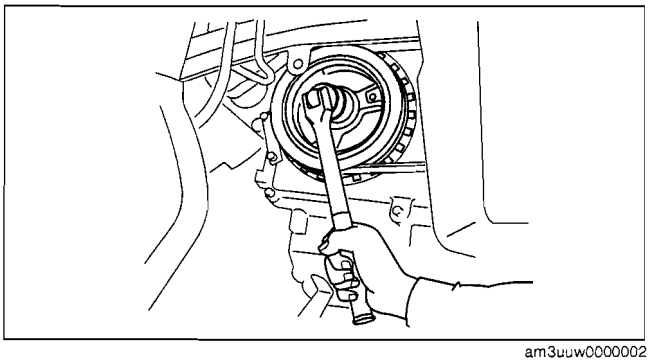
1	Input/turbine speed sensor connector
2	VSS connector

3	GND wiring harness
4	Transaxle connector (primary)

5	TR switch connector
6	GND wiring harness
7	Oil pressure switch connector (for oil filter)
8	Oil pressure switch connector (for ATX)
9	Intermediate sensor connector
10	Transaxle connector (secondary)
11	TCM connector
12	Oil dipstick and filler tube
13	Harness bracket
14	Transaxle mounting bolt (upper side)
15	Stabilizer control link
16	Tie-rod end ball joint (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.)
17	Lower arm ball joint (See 02-13-9 FRONT LOWER ARM REMOVAL/INSTALLATION.)
18	Drive shaft (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.)
19	Drive shaft (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.)
20	Joint shaft (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
21	Selector cable (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
22	Oil cooler (See 05-17B-56 OIL COOLER REMOVAL/INSTALLATION[FS5A-EL].)
23	Starter (See 01-19A-2 STARTER REMOVAL/INSTALLATION[LF, L3].)
24	End plate cover
25	Torque converter installation nuts (See 05-17B-45 Torque Converter Nuts Removal Note.) (See 05-17B-50 Torque Converter Nuts Installation Note.)
26	No.1 engine mount rubber (See 05-17B-49 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
27	Dynamic damper
28	Battery tray bracket
29	No.4 engine mount rubber (See 05-17B-46 No.4 Engine Mount Removal Note.) (See 05-17B-49 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
30	No.4 engine mount bracket (See 05-17B-46 No.4 Engine Mount Removal Note.) (See 05-17B-49 No.1 Engine Mount and No.4 Engine Mount Installation Note.)
31	Transaxle mounting bolt (lower side)
32	Transaxle (See 05-17B-47 Transaxle Removal Note.) (See 05-17B-48 Transaxle Installation Note.)

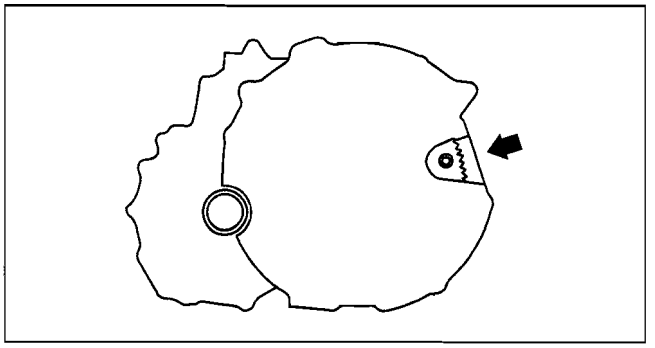
Torque Converter Nuts Removal Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.



am3uuw0000002

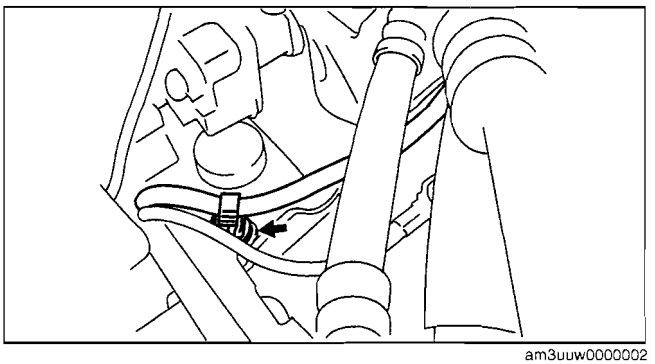
2. Remove the torque converter nuts from the starter installation hole.



am3uuw0000002

No.4 Engine Mount Removal Note

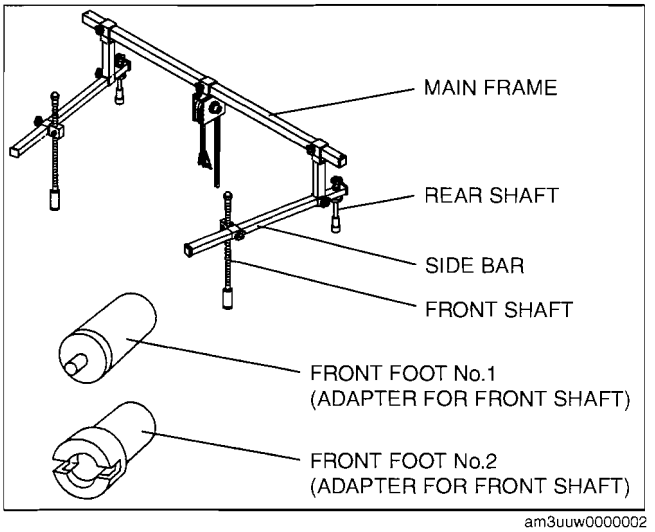
1. To install the front shaft (RH) of the **SST** (49 C017 5A0), remove the clip shown in the figure.
2. Install the **SST** using the following procedure.



am3uuw0000002

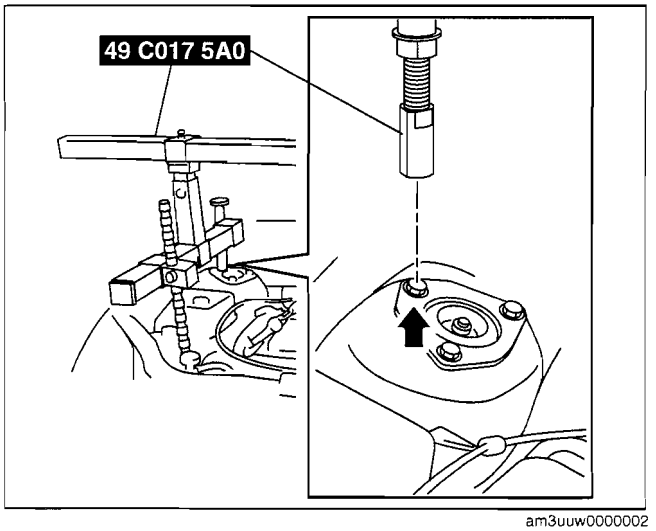
Caution

- **Refer to the SST instruction manual for the basic handing procedure.**



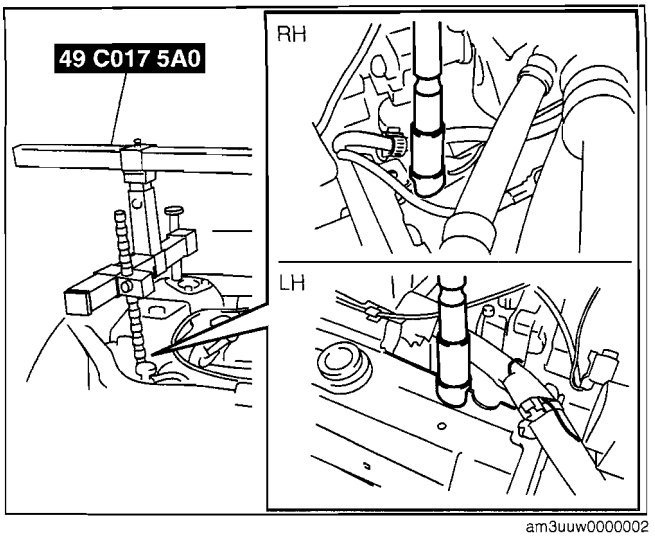
am3uuw0000002

(1) Install the right rear shaft of the **SST** to the bolt of the right shock absorber as shown in the figure.
(2) Install the left rear shaft of the **SST** to the bolt of the left shock absorber (identical position to right side).



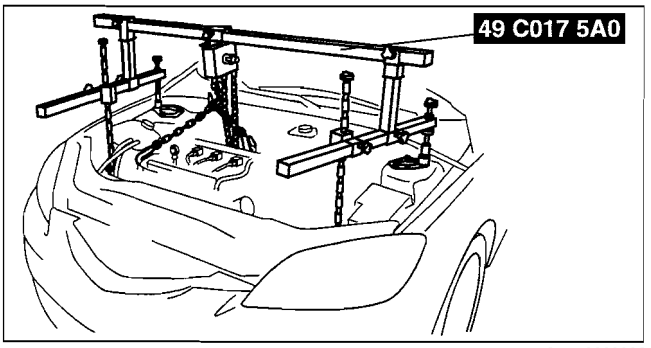
am3uuw0000002

(3) Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.
(4) Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.
(5) Make sure each joint is securely tightened.



am3uuw0000002

3. Suspend the engine using the **SST**.
4. Remove the battery tray bracket, No.4 engine mount rubber and bracket.



am3uuw0000002

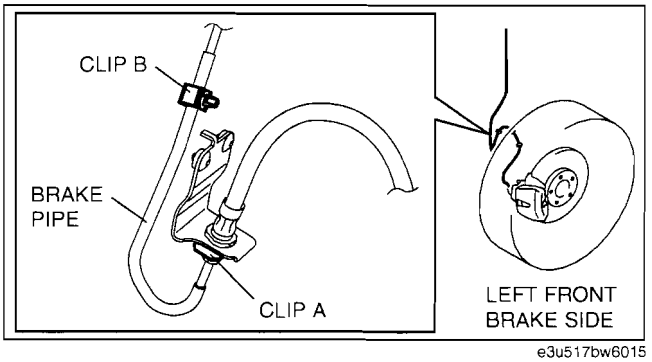
Transaxle Removal Note

Warning
- **Remove the transaxle carefully, holding it steady. If the transmission falls it could be damaged or cause injury.**

Caution
- **To prevent the torque converter and transmission from separating, remove the transmission without tilting it toward the torque converter.**

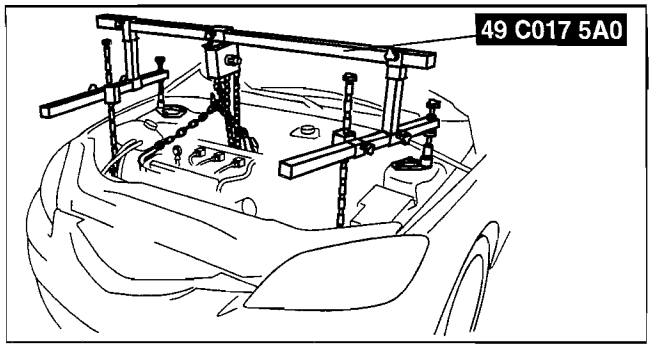
1. Remove the clip A.
2. Remove the clip B from the brake pipe (LF).

Note
- To prevent interference with the ATX, move the brake pipe (LF) and secure a space.



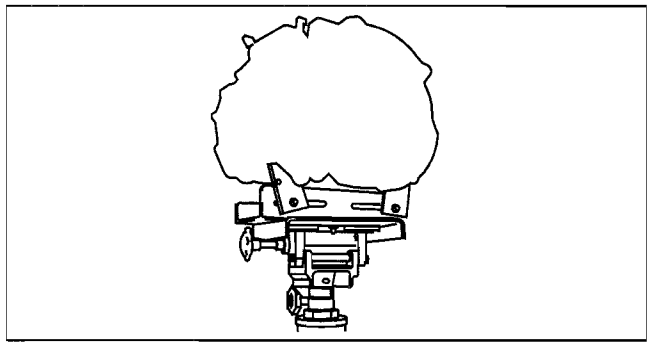
e3u517bw6015

3. Lean the engine toward the transaxle.
4. Support the transaxle on a jack.
5. Remove the transaxle mounting bolts.



am3uuw0000002

6. Remove the transaxle.


am3uuw0000004

Transaxle Installation Note

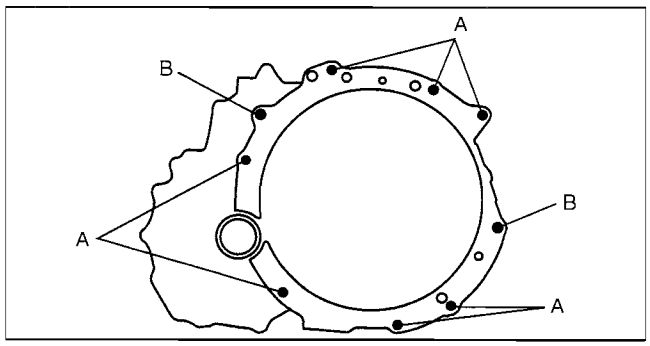
Warning
- **Install the transaxle carefully, holding it steady. If the transmission falls it could be damaged or cause injury.**

Caution
- **To prevent the torque converter and transmission from separating, install the transmission without tilting it toward the torque converter.**

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

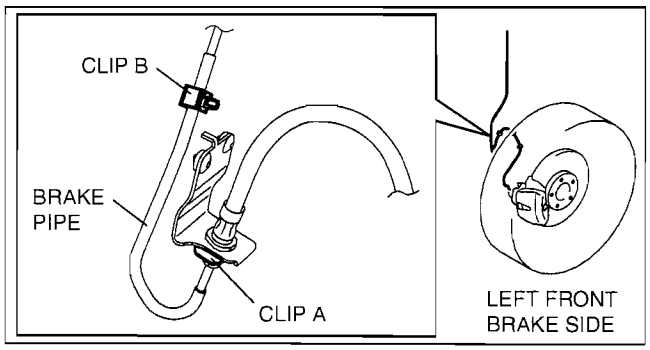
Bolt length (measured from below the head)
A: 50 mm {1.967 in}
B: 65 mm {2.559 in}

Tightening torque
37.3—52.0 N·m
{3.8—5.3 kgf·m, 27.6—38.3 ft·lbf}



am3uuw0000002

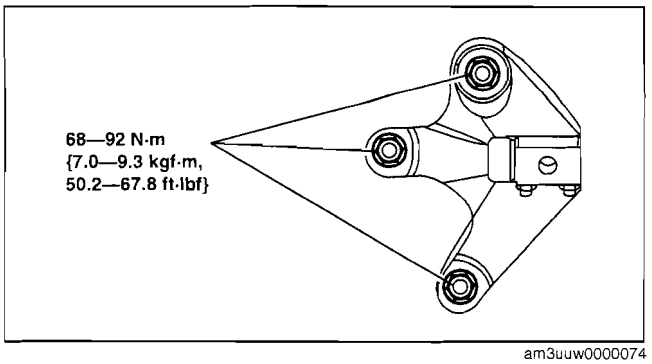
3. Install the brake pipe (LF) to the clip B.
4. Install the clip A.



e3u517bw6015

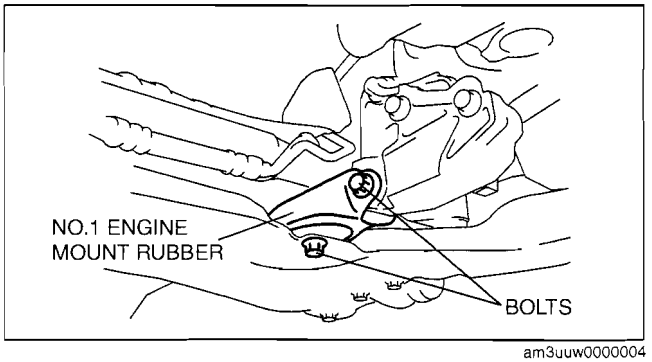
No.1 Engine Mount and No.4 Engine Mount Installation Note

1. Install the No.4 engine mount bracket on the transaxle case and tighten nuts.



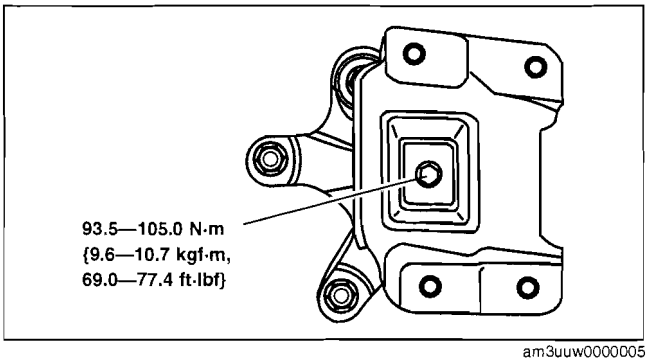
am3uuw0000074

2. Install the No.1 engine mount rubber to the crossmember and temporarily tighten bolts.



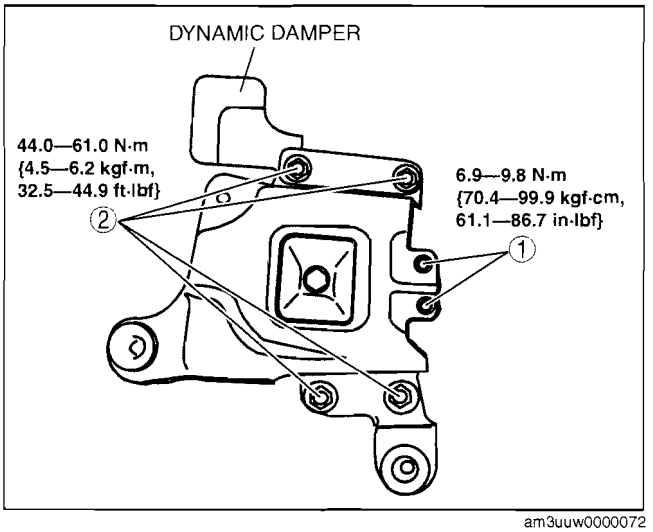
am3uuw0000004

3. Place the No.4 engine mount rubber with the body stud bolts passing through the holes and tighten the bolt as shown in the figure.
4. Place the battery tray bracket over the No.4 engine mount bracket with the body stud bolts passing through the holes.



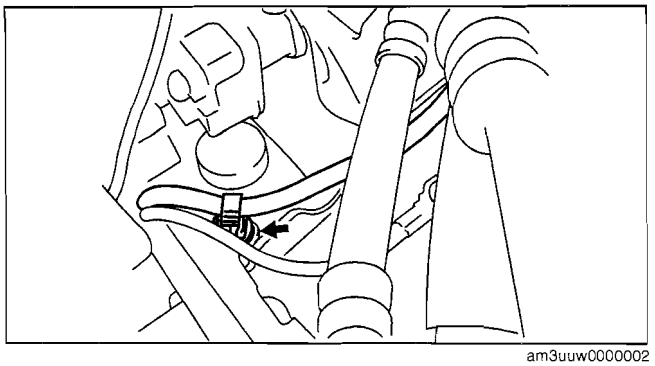
am3uuw0000005

5. Place the dynamic damper over the battery tray bracket with the body stud bolts passing through the holes, then tighten the bolts and nuts in the order shown in the figure.
6. Remove the **SST**.



am3uuw0000072

7. Install the clip as shown in the figure.



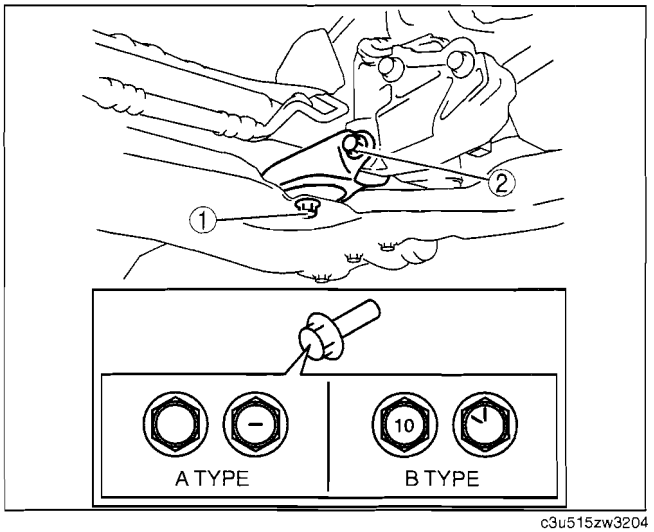
am3uuw0000002

8. Fully tighten the bolts

Caution
- **Tighten the bolts in the order shown in the figure to prevent abnormal noise and vibration after assembly.**
- **Tighten the bolts while being careful of their length to prevent interference between the steering gear housing and bolt.**

Bolt length (measured from below the head)
Front crossmember side: 62 mm {2.441 in}
No.1 engine mount bracket side: 65 mm {2.559 in}

Tightening torque
A type: 72.6—90.9 N.m {7.5—9.2 kgf.m, 53.6—67.0 ft.lbf}
B type: 93.1—116.6 N·m {9.5—11.8 kgf·m, 68.7—85.9 ft·lbf}

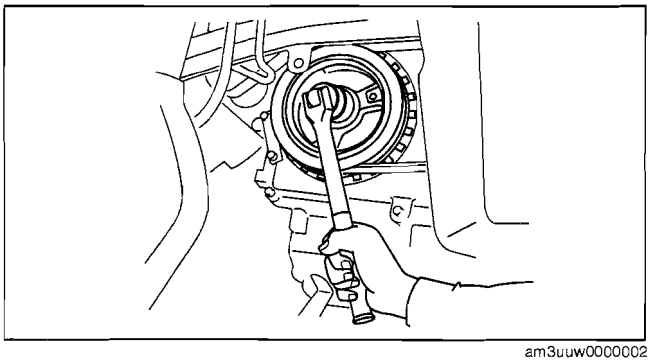


c3u515zw3204

Torque Converter Nuts Installation Note

1. Hold the crankshaft pulley to prevent the drive plate from rotating.

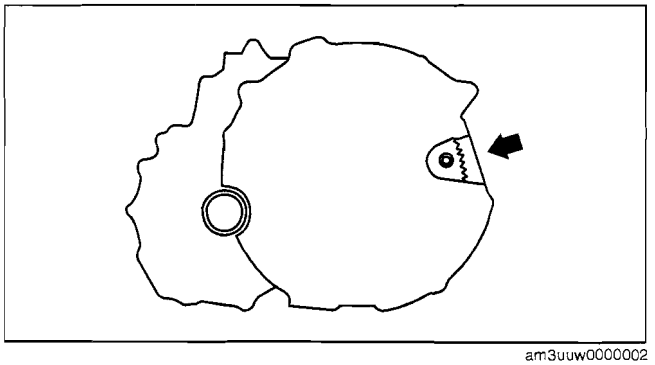
Caution
- **Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.**



am3uuw0000002

2. Tighten the torque converter mounting nuts.

Tightening torque
40.5—54.7 N·m {4.2—5.5 kgf·m, 29.9—40.3 ft·lbf}



am3uuw0000002

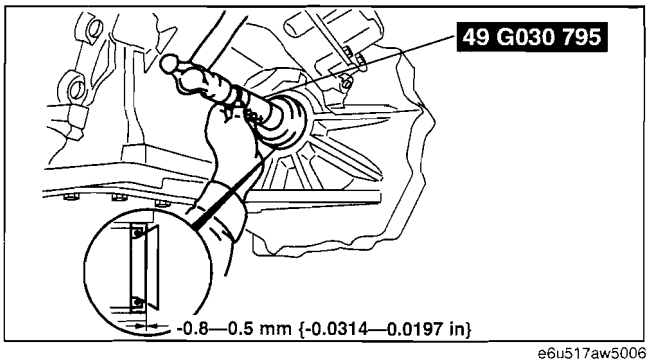
OIL SEAL REPLACEMENT[FS5A-EL]

id051721804400

1. Drain the ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)

Caution
- **The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.**

2. Remove the drive shaft and joint shaft. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
3. Remove the oil seal.
4. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the transaxle case.
5. Coat the lip of the oil seal with transaxle oil.
6. Install the drive shaft and joint shaft. (See 03-13-9 DRIVE SHAFT REMOVAL/INSTALLATION.) (See 03-13-4 JOINT SHAFT REMOVAL/INSTALLATION[L3, L3 WITH TC].)
7. Add ATF to the specified level. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
8. Perform the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)



e6u517aw5006

PRIMARY CONTROL VALVE BODY REMOVAL[FS5A-EL]

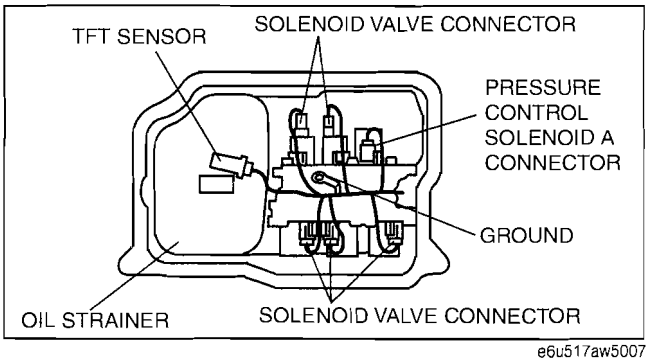
id051721807300

On-Vehicle Removal

Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyes whenever using compressed air.**

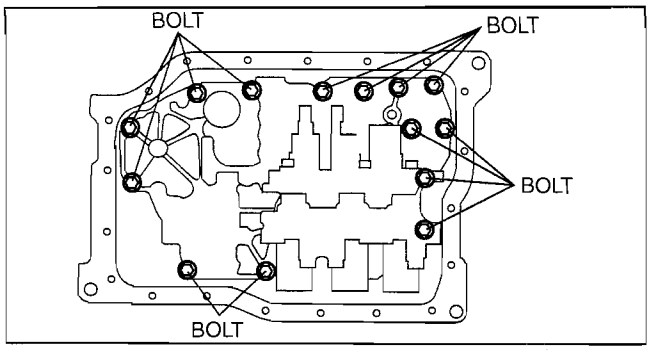
Caution
- **Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Drain the ATF into a separate suitable container. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
4. Remove the under cover.
5. Remove the oil pan.
6. Disconnect the solenoid connectors and GND.
7. Remove the oil strainer.



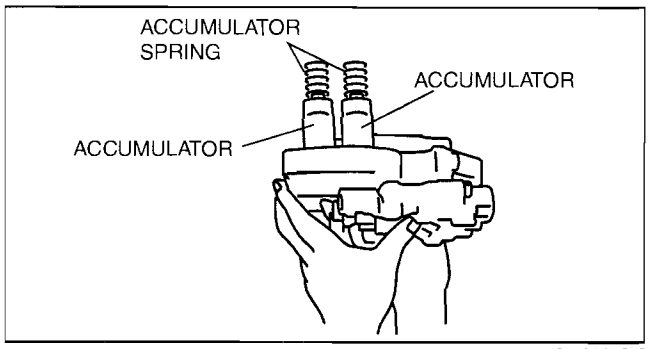
e6u517aw5007

8. Remove the primary control valve body installation bolts as shown, then remove the primary control valve body component as shown.



d6e517aw5029

9. Remove the accumulators and accumulator springs.



a6e5614w059

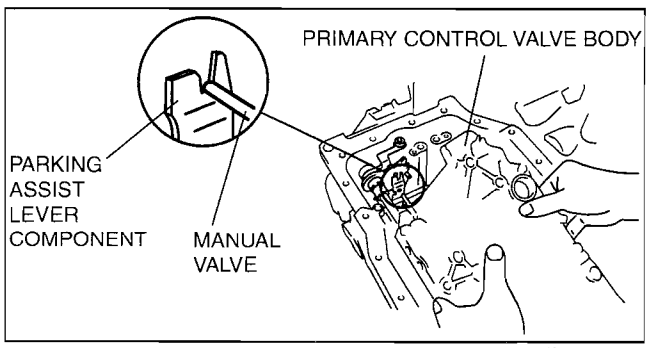
PRIMARY CONTROL VALVE BODY INSTALLATION[FS5A-EL]

id051721807400

On-Vehicle Installation

Caution

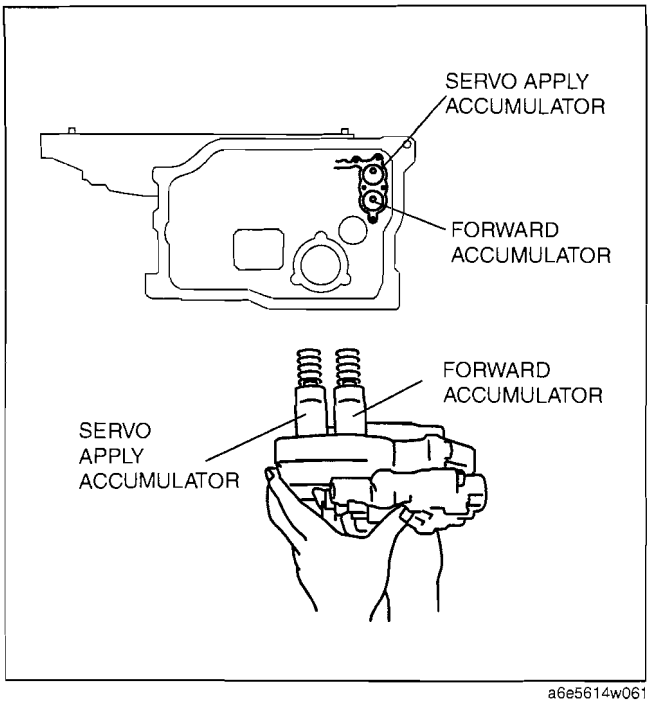
- **Be sure to align the parking rod and the manual valve.**



d6e517za5002

1. Install the accumulator springs and accumulators into the transaxle case.

Spring	Outer diameter (mm {in})	Free Length (mm {in})	No. of coils	Wire diameter (mm {in})
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator large spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator small spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}

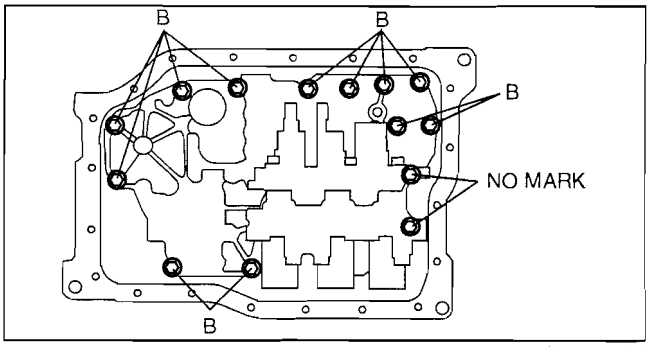


a6e5614w061

2. Install the primary control valve body component.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 70—95 in·lbf}

Bolt length (measured from below the head)
B: 40 mm {1.575 in}
No mark: 70 mm {2.756 in}

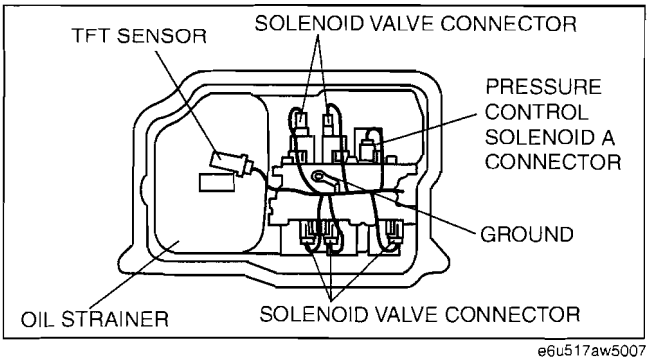


d6e517za5003

3. Install the oil strainer.

4. Match the harness colors, then connect the solenoid connectors and GND, and install the TFT sensor.

Spring	Color of connector (harness side)
Pressure control solenoid A	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	White
Shift solenoid E	Black

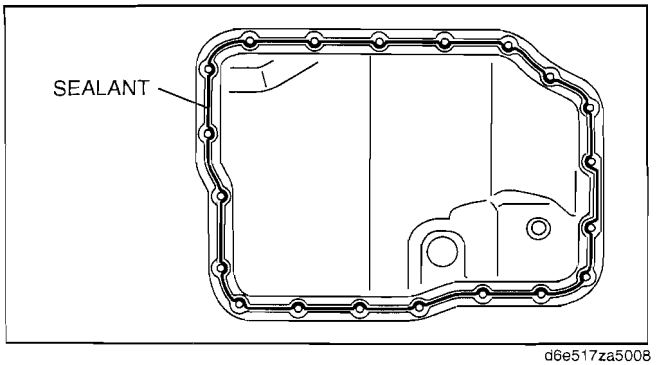


e6u517aw5007

Tightening torque
7.8—10.8 N·m {80—110 kgf·cm, 70—95 in·lbf}

5. Apply a light coat of silicon sealant to the contact surfaces of the oil pan and transaxle case.
6. Install the oil pan.

Tightening torque
6—8 N·m {62—81 kgf·cm, 53—70 in·lbf}



d6e517za5008

7. Install the under cover.
8. Connect the negative battery cable.
9. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
10. Add ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
11. Carry out the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)
12. Carry out the road test. (See 05-17B-6 ROAD TEST[FS5A-EL].)

SECONDARY CONTROL VALVE BODY REMOVAL[FS5A-EL]

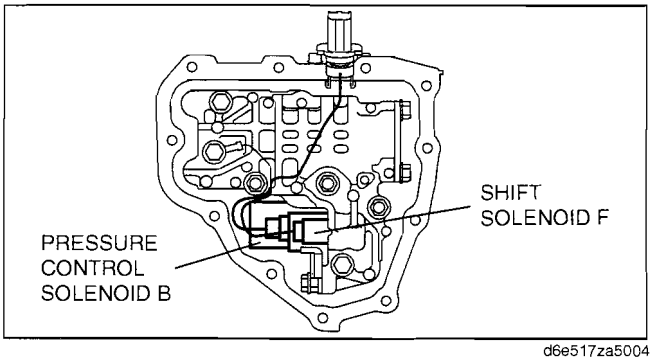
id051721807500

On-Vehicle Removal

Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyes whenever using compressed air.**

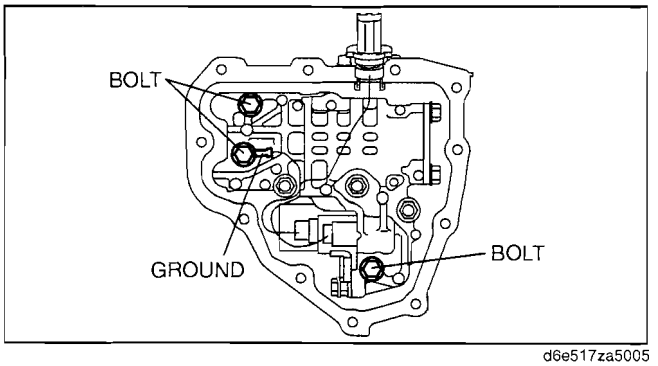
Caution
- **Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.**
- **If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.**

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Drain the ATF into a separate suitable container. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
5. Remove the oil cover.
6. Disconnect the transaxle connectors.



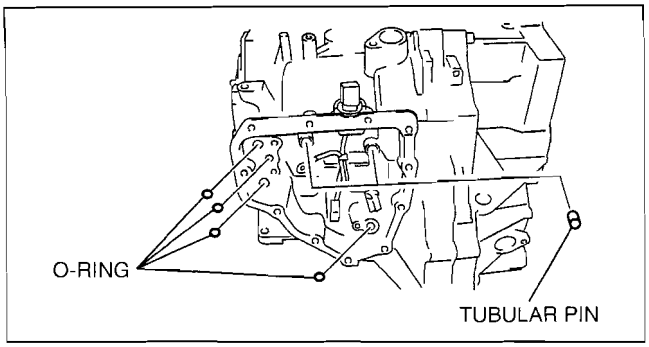
d6e517za5004

7. Remove the secondary control valve body installation bolts as shown, then remove the secondary control valve body component and ground as shown.



d6e517za5005

8. Remove the tubular pin and O-ring.



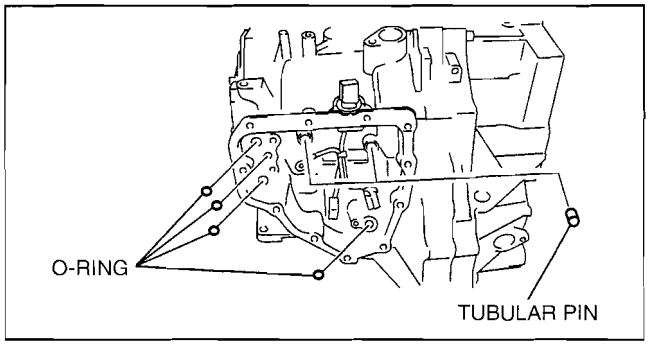
d6e517aw5031

SECONDARY CONTROL VALVE BODY INSTALLATION[FS5A-EL]

id051721807600

On-Vehicle Installation

1. Install the tubular pin and O-ring to the transaxle case.

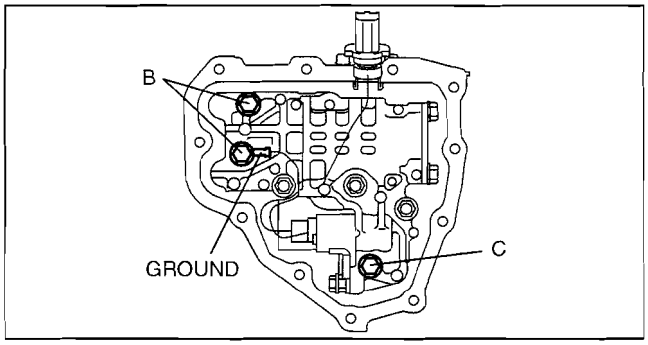


d6e517aw5031

2. Install the secondary control valve body component and ground.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 70—95 in·lbf}

Bolt length (measured from below the head)
B: 40 mm {1.575 in}
C: 50 mm {1.967 in}



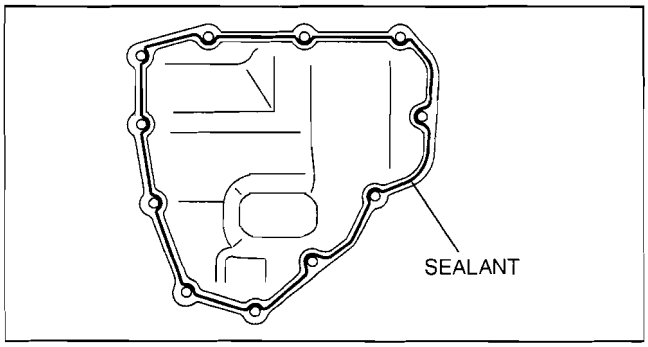
d6e517za5006

3. Match the harness colors, then connect the solenoid connector.

Spring	Color of connector (harness side)
Pressure control solenoid B	White
Shift solenoid F	Black

4. Apply a light coat of silicon sealant to the contact surfaces of the oil cover and transaxle case.
5. Install the oil cover.

Tightening torque
7.8—10.8 N·m {80—109 kgf·cm, 70—95 in·lbf}



d6e517za5007

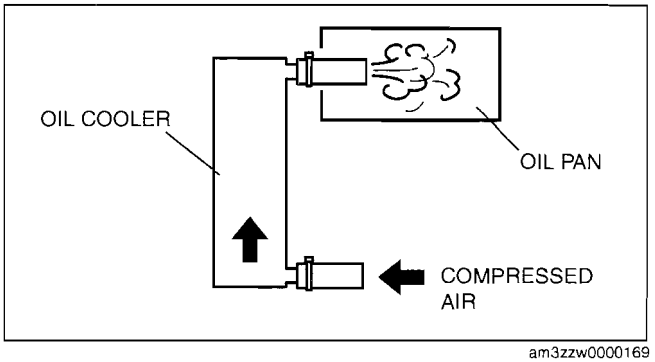
6. Install the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
7. Connect the negative battery cable.
8. Install the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
9. Add ATF. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
10. Carry out the mechanical system test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)
11. Carry out the road test. (See 05-17B-6 ROAD TEST[FS5A-EL].)

OIL COOLER FLUSHING[FS5A-EL]

id051721801500

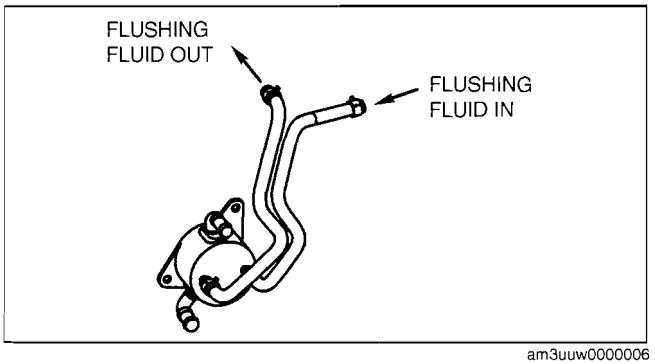
Note
- If the automatic transaxle is replaced, flush and inspect the oil cooler.
- When replacing the automatic transaxle, inspect the oil cooler together with flushing it using the following procedure, and with the oil cooler hose removed.

1. Disconnect the oil cooler hose.
2. Set a clean oil pan up to the oil cooler hose inlet.



am3zzw0000169

3. Blow **491—882 kPa {5—9 kgf/cm^2, 72—127 psi}** of compressed air from the oil cooler hose outlet to drain remaining oil.
4. Add new ATF from the oil cooler hose outlet and blow **491—882 kPa {5—9 kgf/cm^2, 72—127 psi}** of compressed air to flush. (Repeat 2 or 3 times)
5. Verify that none of the following foreign material is mixed in with the drained ATF:
   - Large metal fragments of ϕ 0.5 mm {0.02 mm} or more that cannot pass through the oil strainer
   - Fibrous clutch facing
6. Repeat the procedures from Step 3 to 4 and flush the inside of the oil cooler.
7. If foreign material such as metal fragments or clutch facing remains even after the oil cooler is flushed repeatedly, replace the oil cooler (radiator).

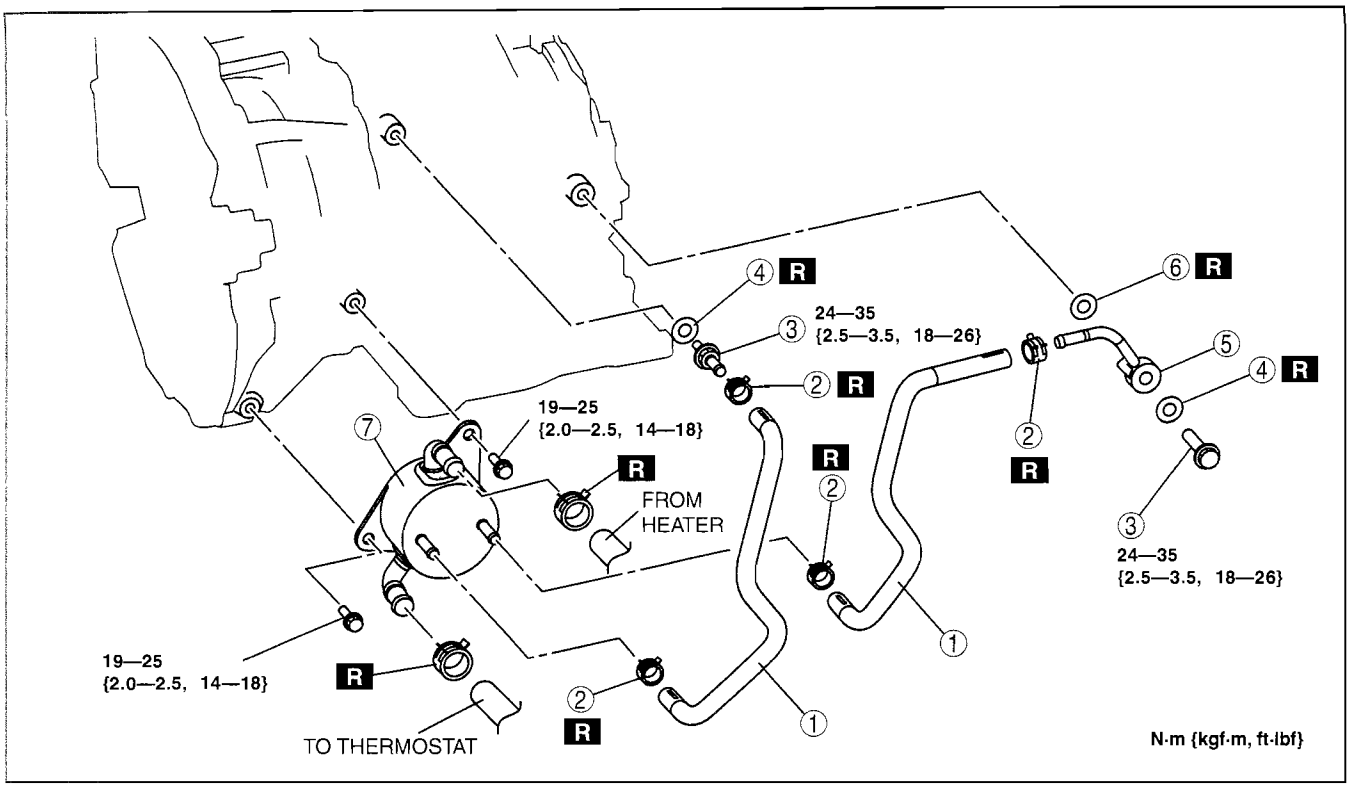


am3uuw0000006

OIL COOLER REMOVAL/INSTALLATION[FS5A-EL]

id051721801600

1. Remove the battery duct and battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
4. Remove the under cover.
5. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
6. Drain the ATF into a container. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
7. Disconnect the water hose.
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Refill the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].)
11. Inspect the engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].)
12. Add ATF to the specified level. (See 05-17B-11 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT[FS5A-EL].)
13. Inspect for oil leakage from the oil pipes and oil hoses.
14. Inspect for coolant from the hoses.
15. Inspect the ATF level and condition. (See 05-17B-9 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION[FS5A-EL].)
16. Perform the line pressure test. (See 05-17B-3 MECHANICAL SYSTEM TEST[FS5A-EL].)



am3uuw0000053

1	Oil hose (See 05-17B-57 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp (See 05-17B-57 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)

3	Connector bolt
4	Packing
5	Oil pipe
6	Packing
7	Oil cooler (See 05-17B-57 Oil Cooler Installation Note.)

Oil Cooler Installation Note

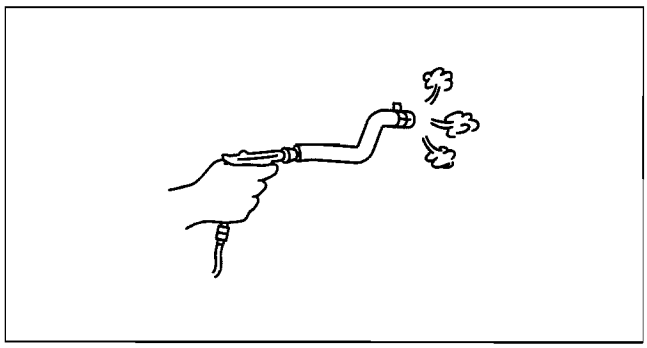
1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

   Note
   - Flushing must be performed after installation of the overhauled or replaced transaxle.

2. Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

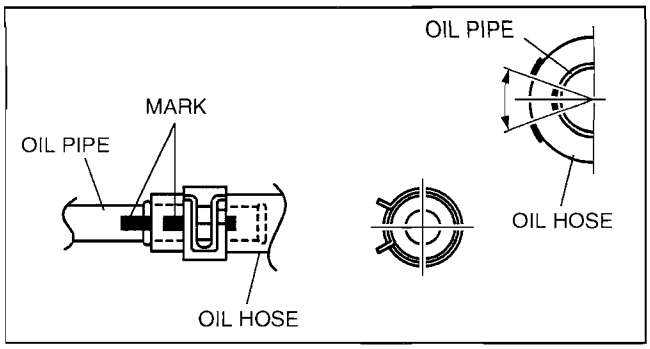
1. Apply compressed air to the cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than 1 min**.



am3uuw0000053

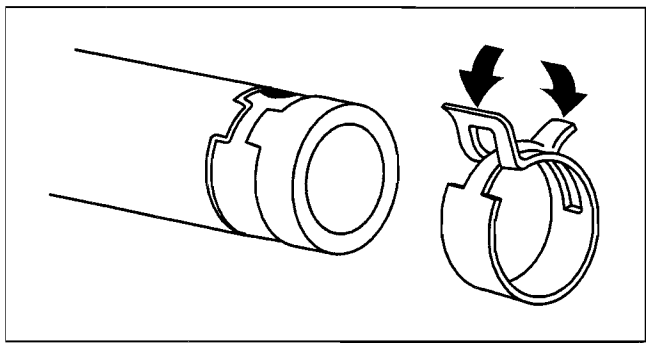
2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.

Note
- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose clamp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in place.



am3uuw0000054

3. Install the new hose clamp onto the hose.
4. Verify that the hose clamp does not interfere with any other components.

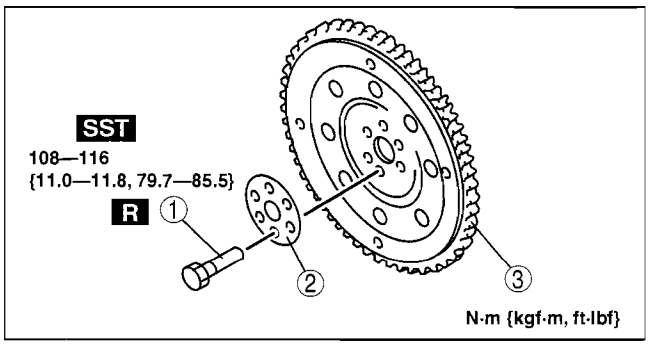

am3uuw0000053

DRIVE PLATE REMOVAL/INSTALLATION[FS5A-EL]

id051721802500

1. Remove the transaxle. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION[FS5A-EL].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

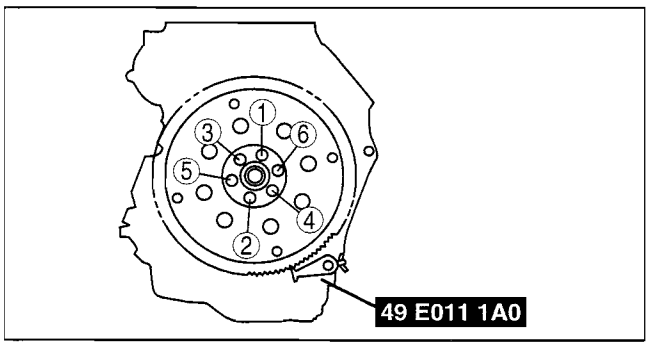
1	Drive plate mounting bolts (See 05-17B-58 Drive Plate Mounting Bolts Removal Note.)
2	Adapter
3	Drive plate (See 05-17B-59 Drive Plate Installation Note.)



dpe517zw1009

Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.
2. Remove the bolts and the drive plate.



c3u0517w046

Drive Plate Installation Note

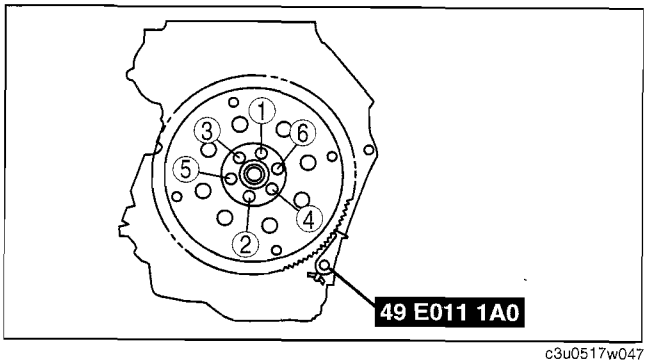
Caution

- **Clean the crankshaft threads before tightening the bolts.The threads may be damaged if the bolts are tightened with any old sealant remaining.**

1. Clean the crankshaft thread holes.
2. Install the drive plate.
3. Install the adapter.
4. Set the **SST** or equivalent against the drive plate.
5. Tighten the drive plate mounting bolts in two or three steps in the order as shown in the figure.

Tightening torque
108—116 N·m
{11.0—11.8 kgf·m, 79.7—85.5 ft·lbf}

6. Install the transaxle. (See 05-17B-42 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION[FS5A-EL].)

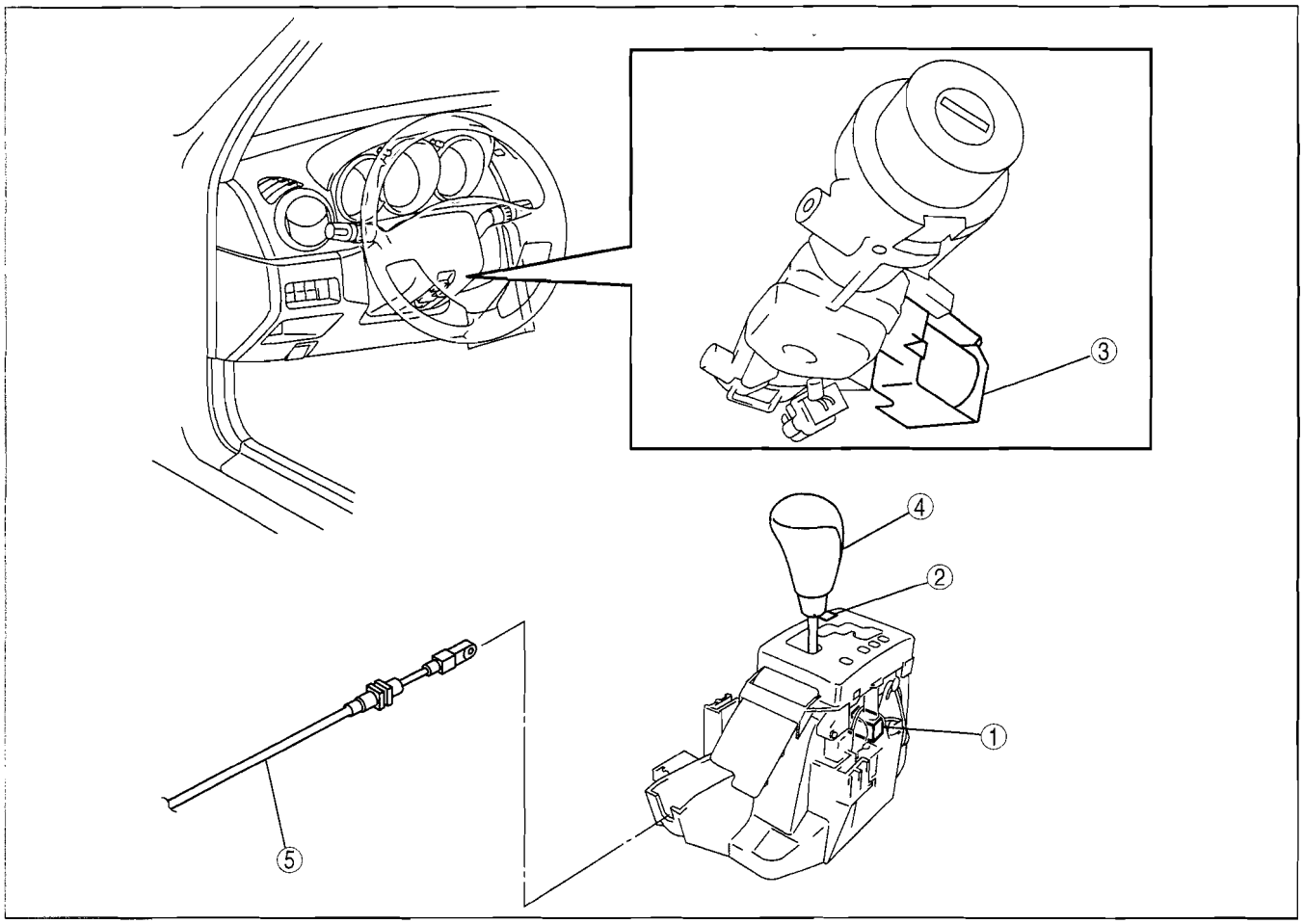


c3u0517w047

05-18 AUTOMATIC TRANSAXLE SHIFT MECHANISM

AUTOMATIC TRANSAXLE SHIFT MECHANISM LOCATION INDEX

id051800801000



c3u0518w003

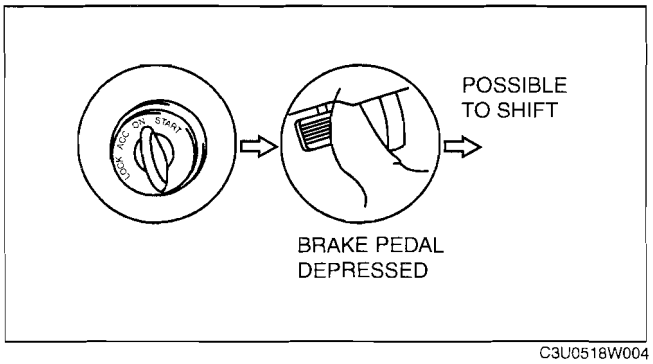
1	Shift-lock solenoid (See 05-18-2 SHIFT-LOCK INSPECTION.) (See 05-18-2 SHIFT-LOCK SOLENOID INSPECTION.)
2	Emergency override button (See 05-18-2 EMERGENCY OVERRIDE BUTTON INSPECTION.)
3	Key interlock solenoid (See 05-18-3 KEY INTERLOCK SOLENOID INSPECTION.)

4	Selector lever (See 05-18-3 SELECTOR LEVER INSPECTION.) (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.) (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.) (See 05-18-9 SELECTOR LEVER DISASSEMBLY/ASSEMBLY.)
5	Selector cable (See 05-18-5 SELECTOR CABLE ADJUSTMENT.)

SHIFT-LOCK INSPECTION

id051800800400

1. Turn the ignition switch to the ON position (engine off).
2. Verify that the selector lever is in the P position.
3. Without the brake pedal depressed, verify that the selector lever cannot be shifted from the P position.
4. Depress the brake pedal and verify that the selector lever can be shifted from the P position.
   - If there is any malfunction, inspect the selector lever component. (See 05-18-4 SELECTOR LEVER COMPONENT INSPECTION.)

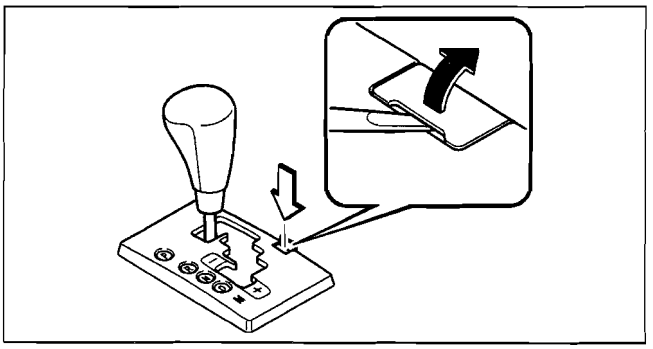


C3U0518W004

EMERGENCY OVERRIDE BUTTON INSPECTION

id051800802100

1. Turn the ignition switch to the LOCK position.
2. Verify that the selector lever is in the P position.
3. Without the brake pedal depressed, verify that the selector lever cannot be shifted from the P position.
4. Remove the panel cover using a screwdriver as shown in the figure.
5. Insert the screwdriver into the emergency override hole and push it down. Verify that the selector lever can be shifted from the P position.
   - If there is any malfunction, replace the selector lever component. (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)

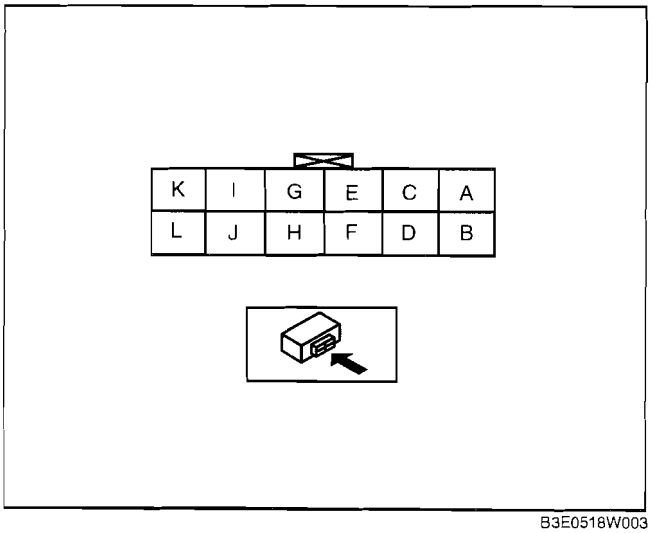


c3u0518w001

SHIFT-LOCK SOLENOID INSPECTION

id051800802200

1. Disconnect the negative battery cable.
2. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Disconnect the selector lever component connector.
4. Measure the continuity between terminals E and F.
   - If there is any malfunction, replace the selector lever component. (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)

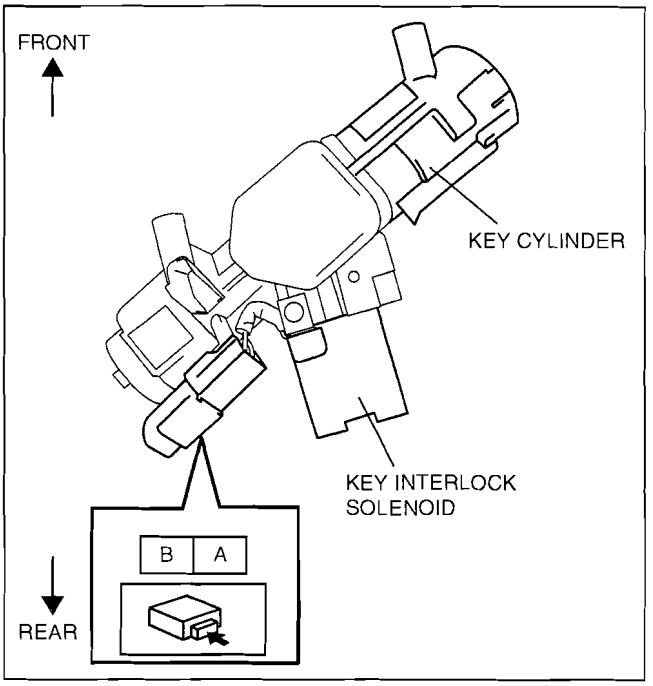


B3E0518W003

KEY INTERLOCK SOLENOID INSPECTION

id051800801100

1. Disconnect the negative battery cable.
2. Remove the column cover. (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Disconnect the key interlock solenoid connector.
4. Measure the continuity between terminals A and B.
   - If there is any malfunction, replace the key cylinder. (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)

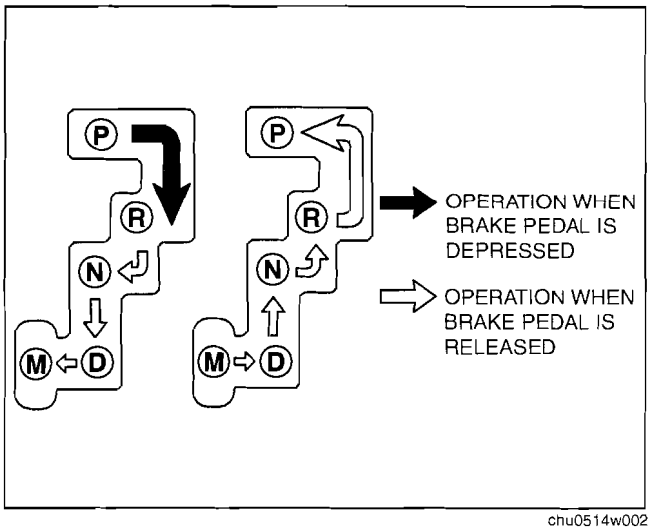


dpe518zw1007

SELECTOR LEVER INSPECTION

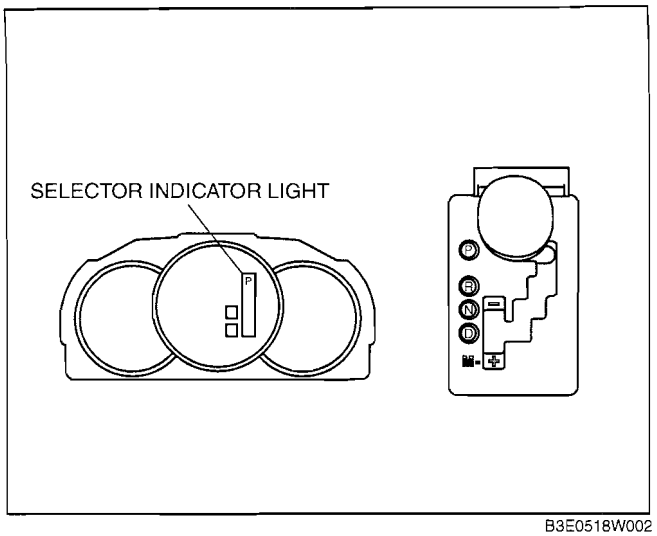
id051800800500

1. Turn the ignition switch to the ON position (engine OFF).
2. With the brake pedal depressed, verify that there is a "click" at each range when shifted.
3. Verify that the selector lever can be shifted.
4. Verify that there is a "click" at each position when shifted from the P position to M range.



chu0514w002

5. Verify that the positions of the selector lever and the indicator are aligned.
   - If there is any malfunction, adjust the TR switch. (See 05-17A-16 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FN4A-EL].)(See 05-17B-17 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT[FS5A-EL].)
6. Verify that the vehicle operates in each selected range.

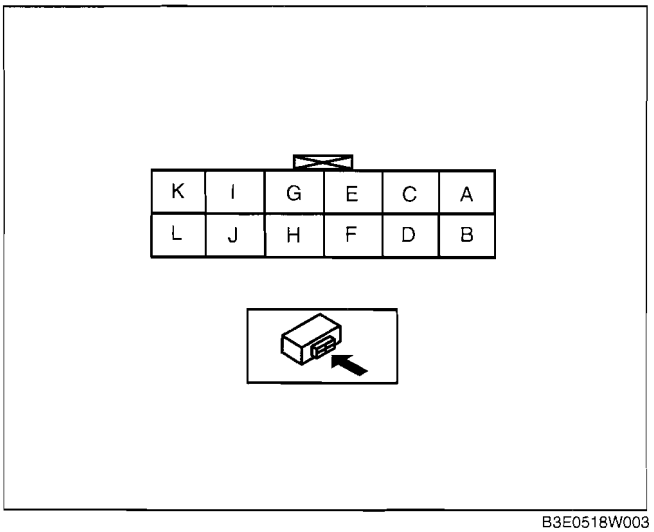


B3E0518W002

SELECTOR LEVER COMPONENT INSPECTION

id051800800600

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
4. Disconnect the selector lever component connector.
5. Verify that the continuity is as indicated in the table.
   - If there is any malfunction, replace the selector lever component. (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)



B3E0518W003

O—O : Continuity

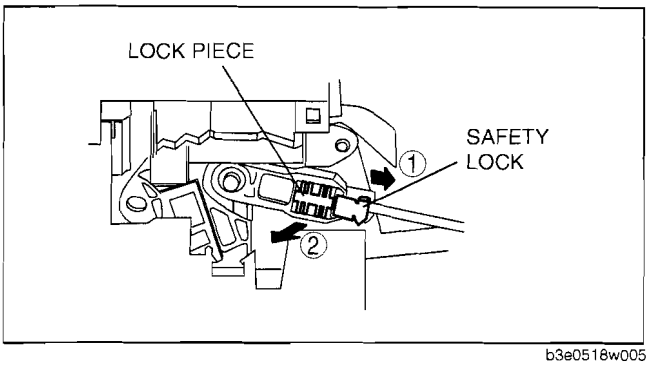
Selector lever position/range		Connector terminal											
		A	B	C	D	E	F	G	H	I	J	K	L
M range	- M			O								O	
	Center M	O										O	
	+ M		O									O	
P position									O	O			
Except P position								O	O				

C3U0518W002

SELECTOR CABLE ADJUSTMENT

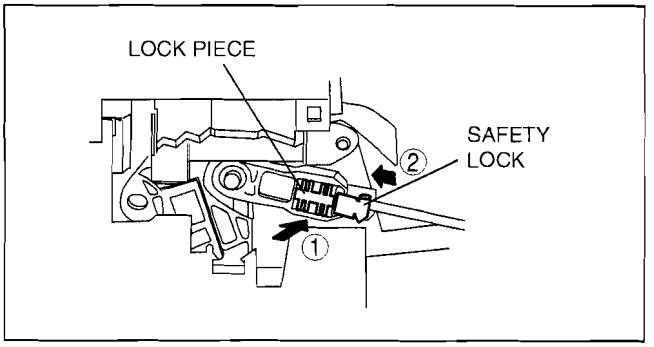
id051800800700

1. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
2. Shift the selector lever to P position.
3. Unlock the lock piece of the selector cable (selector lever side) in the order as shown in the figure.
4. Verify that the manual shaft is in the P position.



b3e0518w005

5. Lock the lock piece and safety lock of the selector cable (selector lever side) in the order as shown in the figure.
6. Install the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
7. Shift the selector lever from the P position to M range, and make sure that there are no other components in that area to interfere with the lever.

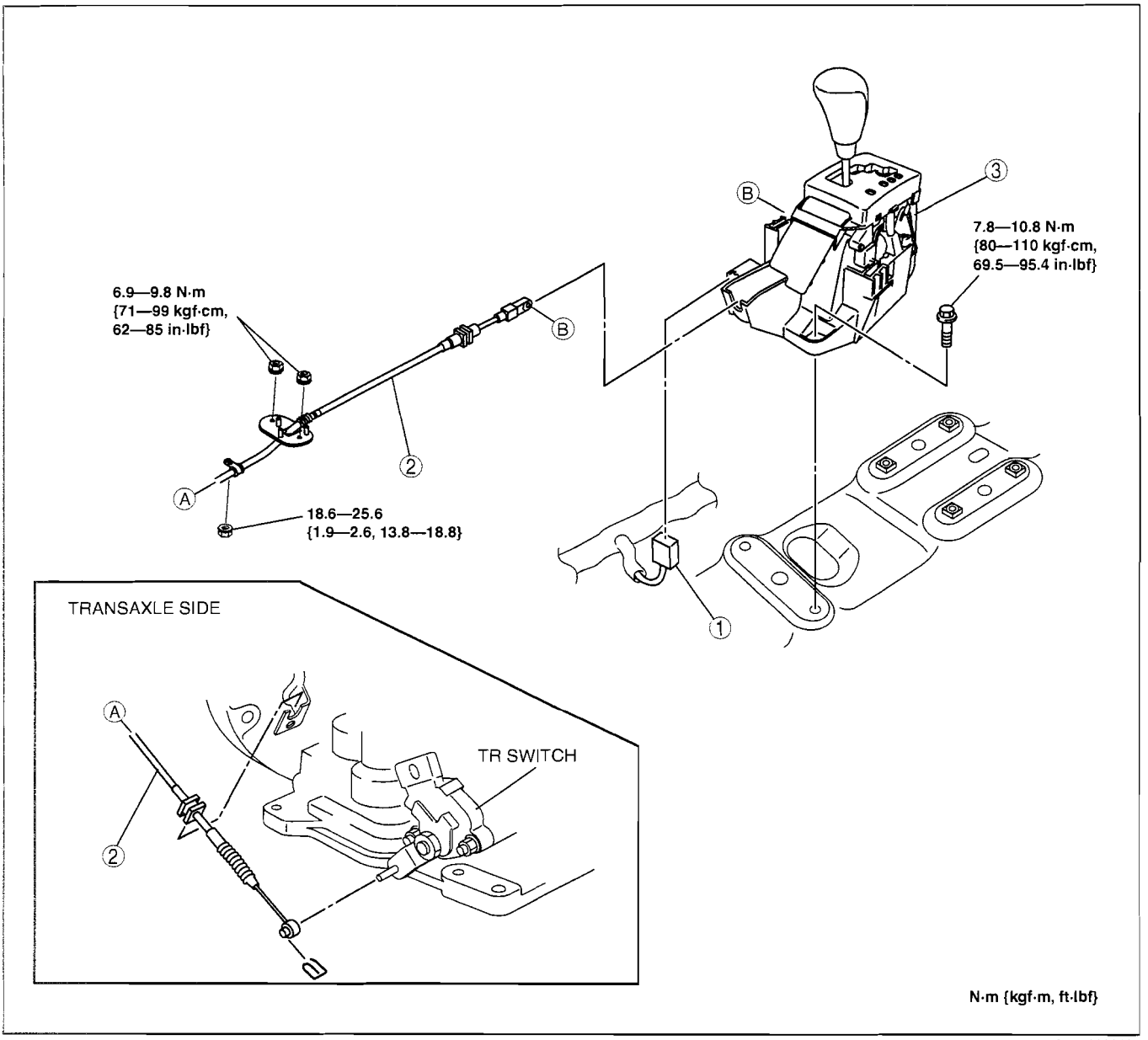


b3e0518w006

SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION

id051800800800

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the battery, battery box and battery tray. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
4. Remove the air cleaner component. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
5. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
6. Remove the heat insulator (front and center).
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.

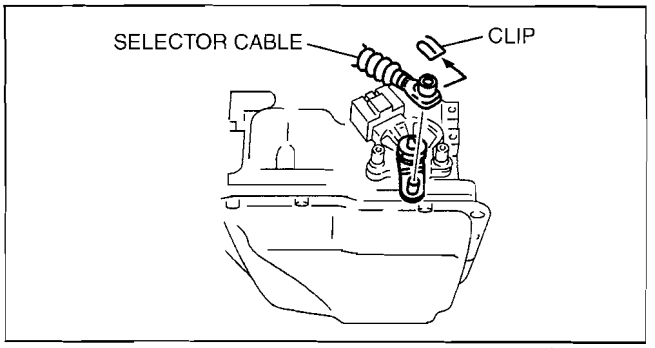


am3uuw0000104

1	Selector lever component connector
2	Selector cable (See 05-18-7 Selector Cable Removal Note.) (See 05-18-7 Selector Cable Installation Note.)
3	Selector lever component (See 05-18-7 Selector Lever Component Installation Note.)

Selector Cable Removal Note

1. Remove the clip.
2. Remove the selector cable.

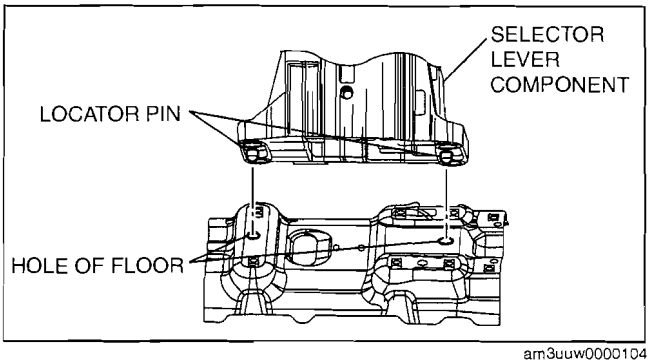


am3uuw0000104

Selector Lever Component Installation Note

1. Insert the location pin of selector lever component to the hole of the floor.
2. Tighten the selector lever component installation bolts.

Tightening torque
7.8—10.8 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}



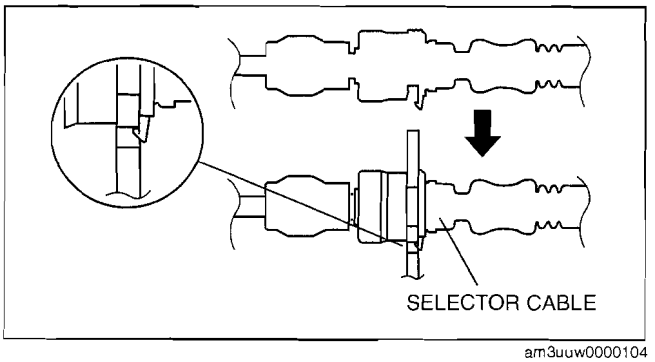
am3uuw0000104

Selector Cable Installation Note

1. Install the selector cable to the selector lever securely.
2. Install the selector cable to the bracket securely.

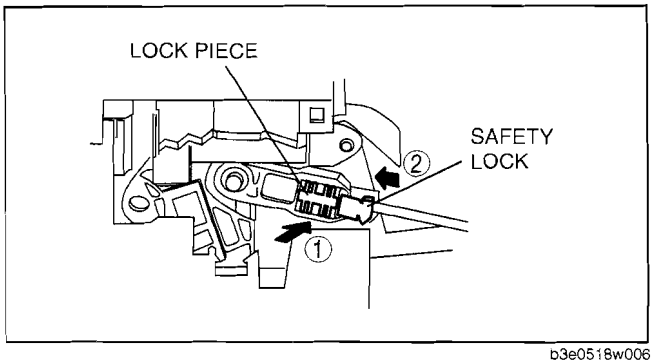
Note
- Steps 3 and 4 are for the selector cable replacement only.

3. Verify that the selector lever is in the P position.



am3uuw0000104

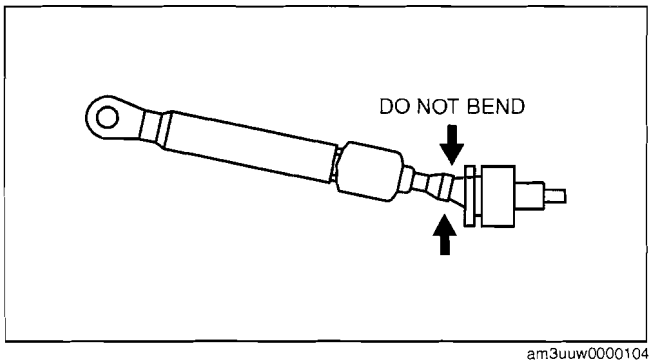
4. Lock the lock piece and safety lock of the selector cable (selector lever side) in the order as shown in the figure.



b3e0518w006

5. Verify that the manual shaft is in the P position.

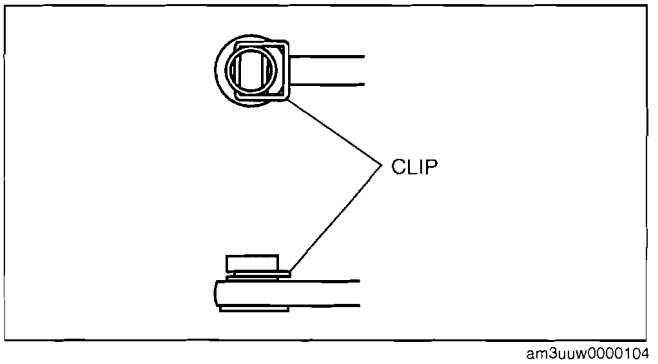
Caution
- **Bending the selector cable in the manner shown in the figure will damage the cable and it may become loose when shifted. When installing the selector cable, hold it straight.**



am3uuw0000104

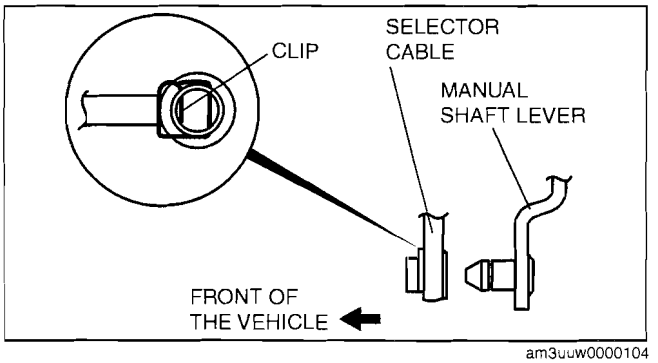
6. Install the clip as shown in the figure.

Note
- Install the selector cable to the manual shaft cable with the clip side of the selector cable end facing the front of the vehicle.



am3uuw0000104

7. Install the selector cable to the manual shaft lever in such a way that the selector cable does not bear a load.
8. Confirm that the end of the manual shift lever projects from the end of the selector cable.
9. Install the selector cable to the selector cable bracket securely.

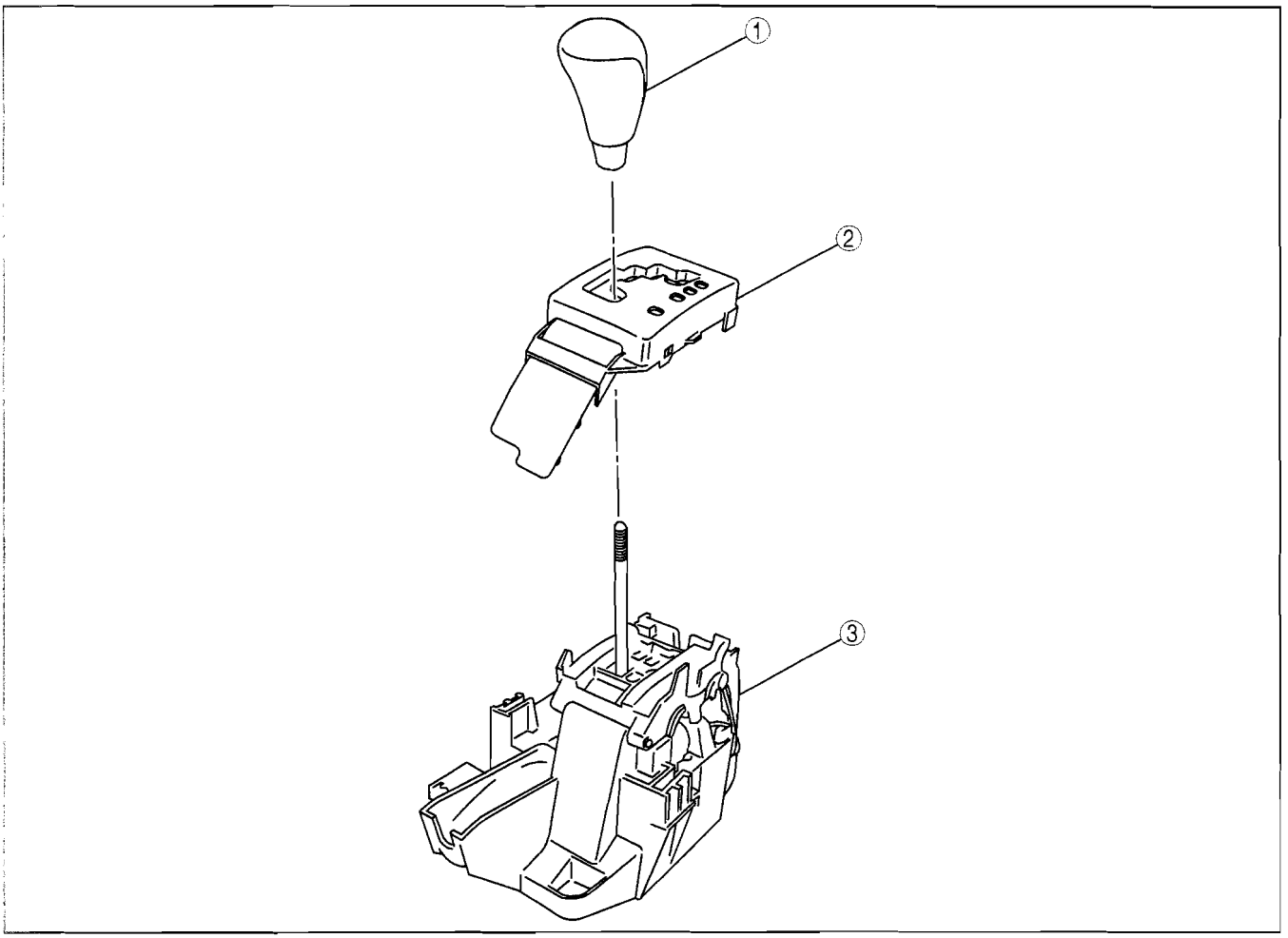


am3uuw0000104

SELECTOR LEVER DISASSEMBLY/ASSEMBLY

id051800800900

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



B3E0518W011

1	Selector lever knob
2	Indicator panel
3	Selector lever component

05-50 TECHNICAL DATA

TRANSMISSION/TRANSAXLE TECHNICAL DATA

id055000800100

Clutch

Item	Specification
Clutch fluid	SAE J1703, FMVSS 116 DOT-3
Clutch pedal disengagement stroke	90—110 mm {3.55—4.33 in} (Reference value)
Clutch pedal stroke	135 mm {5.31 in} (Reference value)
Clutch cover diaphragm spring fingers maximum depth	0.6 mm {0.024 in}
Maximum clearance of flatness of the pressure plate	LF, L3: 0.5 mm {0.020 in} L3 WITH TC: 0.3 mm {0.012 in}
Clutch cover diaphragm spring fingers maximum height difference	1.0 mm {0.039 in}
Clutch disc minimum depth	0.3 mm {0.012 in}
Clutch disc maximum runout	0.7 mm {0.028 in}
Flywheel maximum runout [LF, L3]	0.1 mm {0.004 in}
Dual-mass flywheel maximum runout [A26M-R]	1.5 mm {0.059 in}

Manual Transaxle [G35M-R]

Item	Specification
Manual transaxle oil Grade	API Service GL-4 or GL-5
Manual transaxle oil Viscosity	All-season: SAE 75W-90 Above 10 °C {50 °F}: SAE 80W-90
Manual transaxle oil capacity (approx. quantity)	2.87 L {3.03 US qt, 2.53 Imp qt}

Manual Transaxle [A26M-R]

Item	Specification
Manual transaxle oil Grade	API Service GL-4 or GL-5
Manual transaxle oil Viscosity	All-season: SAE 75W-90
Manual transaxle oil Capacity (approx. quantity)	2.5 L {2.6 US qt, 2.2 Imp qt}

AUTOMATIC TRANSAXLE [FN4A-EL]

Item				Specification
ATF	Type			ATF M-V
	Capacity (Approx. quantity) (L {US qt, Imp qt})			7.2 {7.6, 6.3}
Line pressure (kPa {kgf/cm^2, psi})		D, M (1GR, 2GR) range	Idle	330—470 {3.4—4.7, 48—68}
			Stall	1,160—1,320 {11.8—13.4, 168—191}
		R position	Idle	490—710 {5.0—7.2, 72—102}
			Stall	1,680—2,020 {17.2—20.5, 244—292}
Engine stall speed (rpm)		D, M range		2,200—2,800
		R position		
Time lag (s)		N position → D range		0.4—0.7
		N position → R position		0.4—0.7

Item			Specification
Transaxle range (TR) switch (ohm)	P position		4,085—4,515
	R position		1,425—1,575
	N position		713—788
	D range		371—409
Transaxle Fluid temperature (TFT) sensor (kilohm)	ATF temperature: –20 °C {–4 °F}		236—324
	ATF temperature: 0 °C {32 °F}		84.3—110
	ATF temperature: 20 °C {68 °F}		33.5—42.0
	ATF temperature: 40 °C {104 °F}		14.7—17.9
	ATF temperature: 60 °C {140 °F}		7.08—8.17
	ATF temperature: 80 °C {176 °F}		3.61—4.15
	ATF temperature: 100 °C {212 °F}		1.96—2.24
	ATF temperature: 120 °C {248 °F}		1.13—1.28
	ATF temperature: 130 °C {266 °F}		0.87—0.98
Input/turbine speed sensor (ohm)	ATF temperature: –40—160 °C {–40—320 °F}		250—600
Vehicle speed sensor (VSS) (V)			4.5—5.5
Solenoid valves (ohm)	ATF temperature: –40—150 °C {–40—302 °F}	Shift solenoid A	1.0—4.2
		Shift solenoid B	1.0—4.2
		Shift solenoid C	1.0—4.2
		Shift solenoid D	10.9—26.2
		Shift solenoid E	10.9—26.2
		Pressure control	2.4—7.3

AUTOMATIC TRANSAXLE [FS5A-EL]

Item	Specification
Average time lag	N position→D range: 0.4—0.7 sec. N position→R position: 0.4—0.7 sec.
ATF type	ATF M-V
Capacity (approx. quantity)	8.14 L {8.6 US qt, 7.2 Imp qt}
Input/turbine speed sensor resistance	250—600 ohms (ATF temperature: –40—160 °C {–40—320 °F})
Intermediate sensor voltage	4.5—5.5 V
Vehicle speed sensor (VSS) voltage	4.5—5.5 V

Line pressure specification

Position/range	Line pressure (kPa {kgf/cm^2, psi})	
	Idle	Stall
D, M (1GR, 2GR)	330—470 {3.4—4.8, 48—68}	1,200—1,320 {12.2—13.5, 174—191}
R	490—710 {5.0—7.2, 71—102}	1,640—1,860 {16.8—18.9, 238—269}

Engine stall speed

Position/range	Engine stall speed (rpm)
D, M (1GR, 2GR)	2,200—2,800
R	

Transaxle range (TR) switch

Terminal	Position/Range	Resistance (ohm)
B—C	P	4,085—4,515
	R	1,425—1,575
	N	713—788
	D	371—409

Transaxle fluid temperature (TFT) sensor

ATF temperature (°C {°F})	Resistance (kilohm)
–20 {–4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98

Primary control valve body (ATF temperature: –40—150 °C {–40—302 °F})

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Shift solenoid A	1.0—4.2
C—GND	Shift solenoid B	1.0—4.2
G—GND	Shift solenoid C	1.0—4.2
B—GND	Shift solenoid D	10.9—26.2
F—GND	Shift solenoid E	10.9—26.2
D—I	Pressure control solenoid A	2.4—7.3

Secondary control valve body (ATF temperature: –40—150 °C {–40—302 °F})

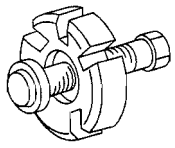
Terminal	Solenoid valve	Resistance (ohm)
A—GND	Pressure control solenoid B	1.0—4.2
B—GND	Shift solenoid F	8.4—21.8

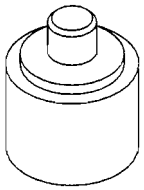
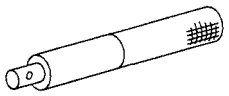
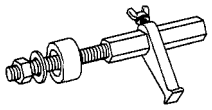
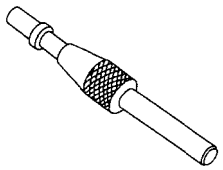
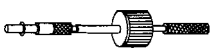
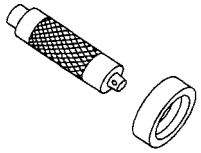
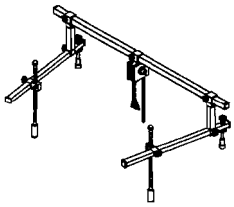
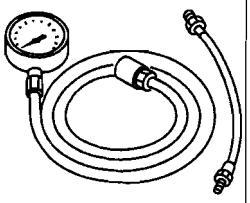
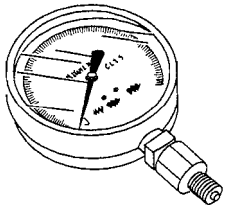
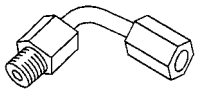
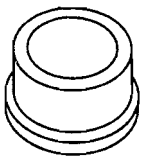
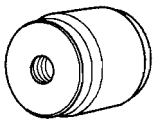
05-60 SERVICE TOOLS

TRANSMISSION/TRANSAXLE SST

id056000500100

1: Mazda **SST** number
2: Global **SST** number
Example

1:49 UN30 3009 2:303-009 Crankshaft damper remover	

1:49 UN30 8157 2:308-157 Pilot bearing installer 	1:49 UN20 5153 2:205-153 Handle 	1:49 E011 1A0 2: – Ring gear brake set 
1:49 SE01 310A 2: – Clutch disc centering tool 	1:49 1285 071 2: – Bearing puller 	1:49 G030 795 2: – Oil seal installer 
1:49 C017 5A0 2: – Engine support 	1:49 0378 400C 2: – Oil pressure gauge set 	1:49 B019 901B 2: – Oil pressure gauge 
1:49 H019 002 2: – Adapter 	1:49 F027 003 2: – Handle 	1:49 F027 009 2: – Attachment ϕ68 and 77 
1:49 W027 001 2: – Body 	—	—

STEERING

06
SECTION

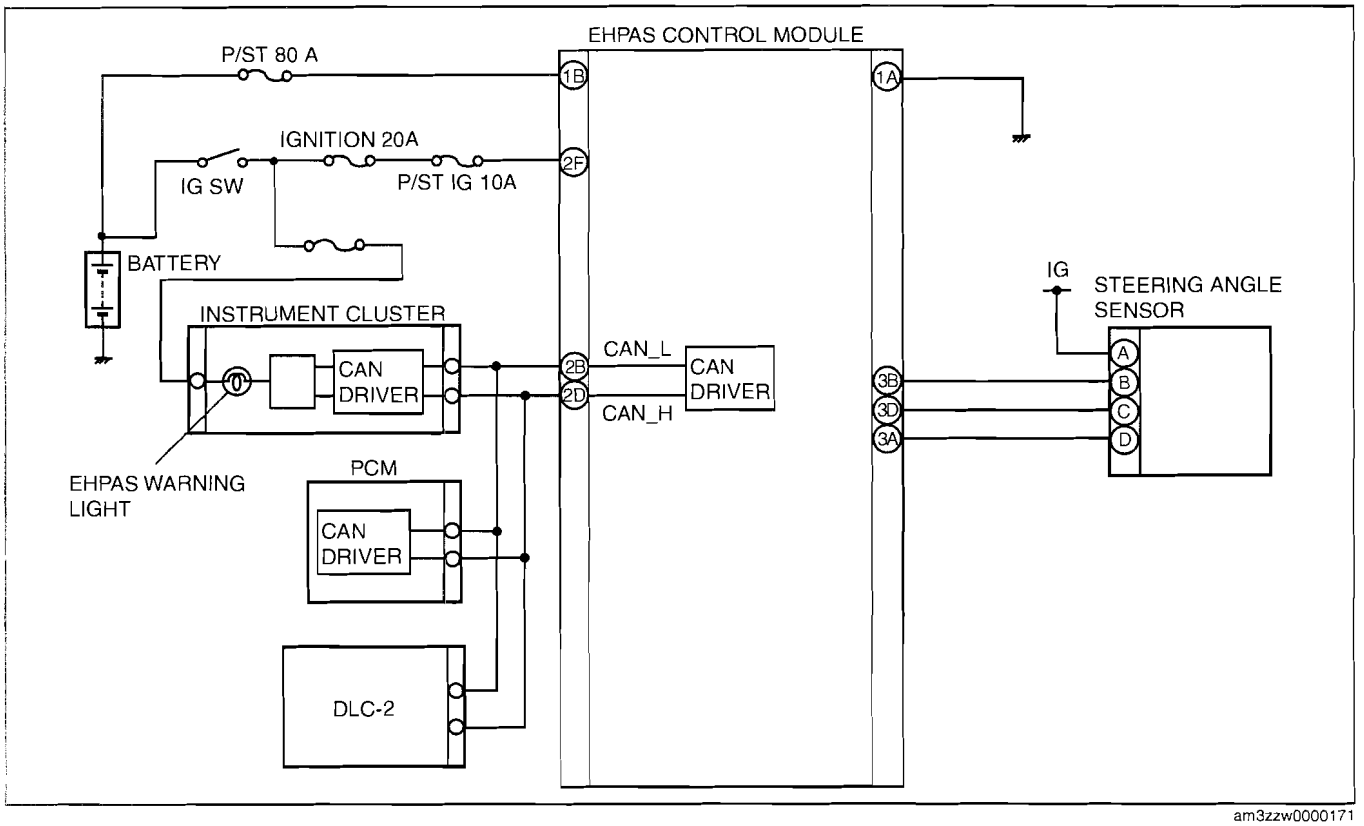
06-02

06-02 ON-BOARD DIAGNOSTIC [ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) SYSTEM WIRING DIAGRAM[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

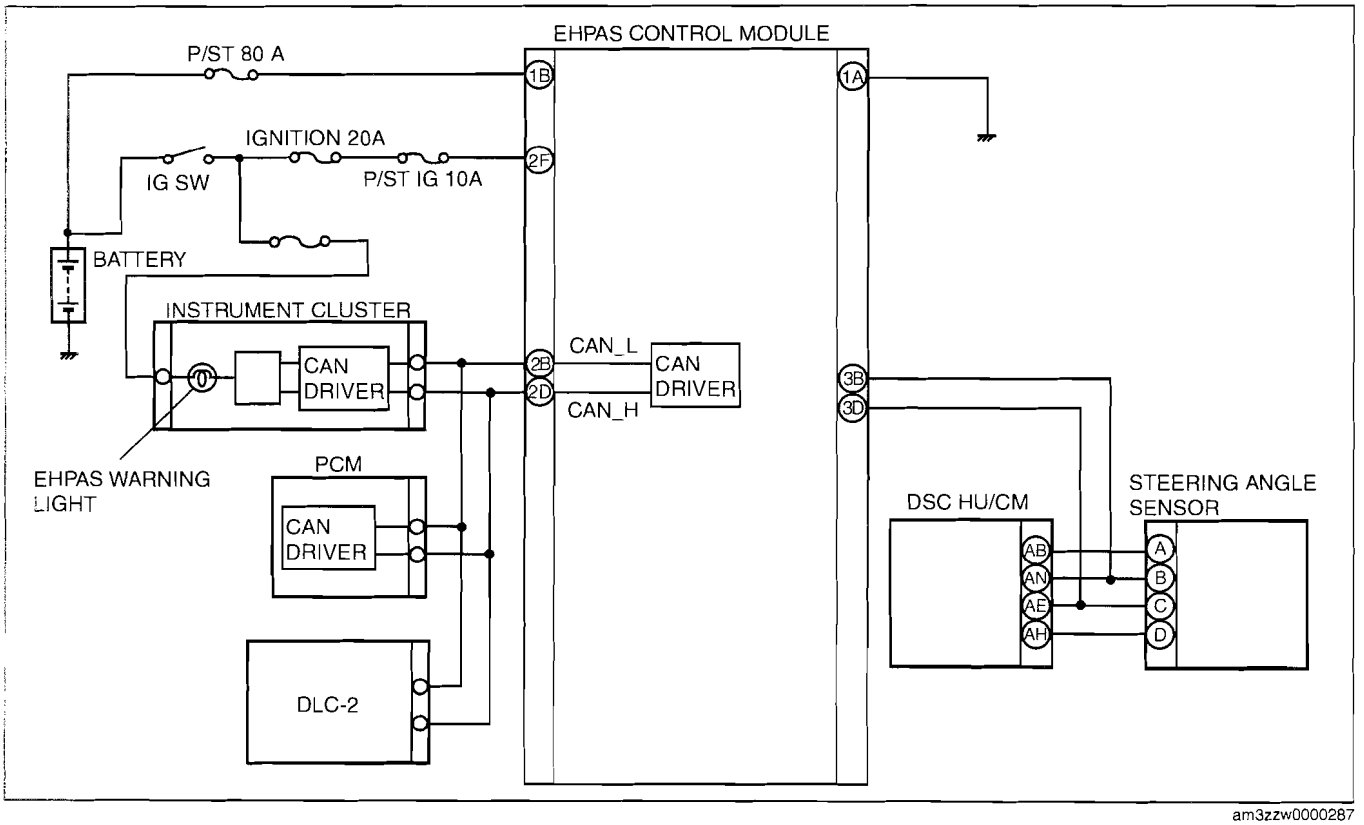
id0602b1800900

Without DSC



am3zzw0000171

With DSC



am3zzw0000287

ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1800800

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the EHPAS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - — Provides a quick inspection of the EHPAS usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 2 tests:
  - — Read/clear diagnostic results, PID monitor and record.

Read/clear diagnostic results

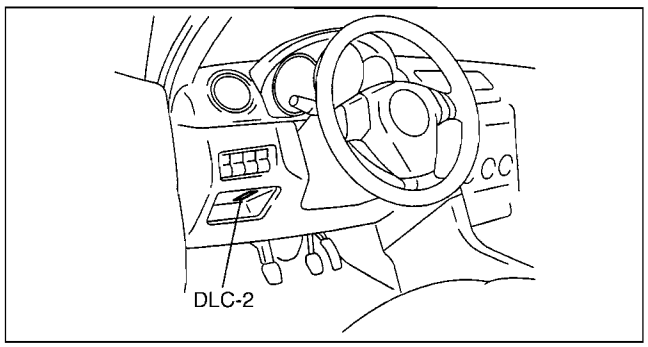
- This function allows reading or clearing of DTCs in the EHPAS control module memory.

PID/Data monitor and record

- This function allows access of certain data values, input signals, calculated values, and system status information.

Reading DTCs Procedure

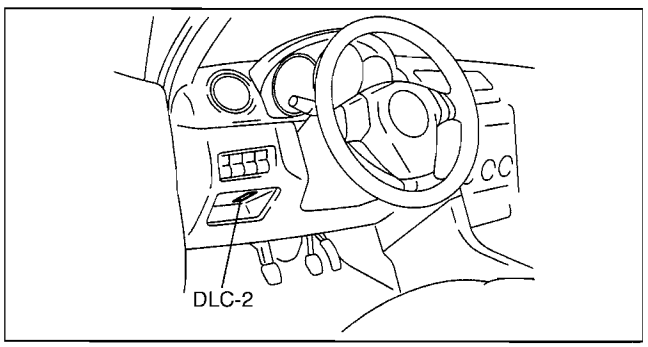
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "EPS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "EPS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the DSC. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)



am3uuw0000022

Clearing DTCs Procedure

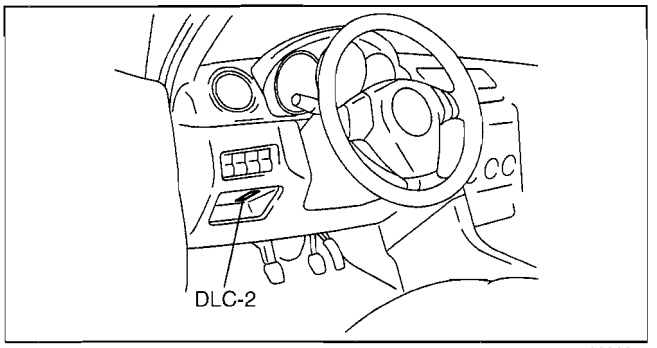
1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "Self Test".
     3. Select "Modules".
     4. Select "EPS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "EPS".
     3. Select "Self Test".
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



am3uuw0000022

PID/Data Monitor and Record Procedure

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Toolbox" tab.
     2. Select "DataLogger".
     3. Select "Modules".
     4. Select "EPS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "EPS".
     3. Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000022

Note

- The PID/Data monitor function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually.

DTC Table

DTC M-MDS	Diagnosis system component	Page
B1238	EHPAS control module	(See 06-02-6 DTC B1238[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
B1317	Battery power supply	(See 06-02-6 DTC B1317, B1318[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
B1318	Battery power supply	(See 06-02-6 DTC B1317, B1318[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
B1342	EHPAS control module	(See 06-02-8 DTC B1342[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
B1352	Ignition power supply	(See 06-02-8 DTC B1352[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
B2477	EHPAS control module configuration	(See 06-02-9 DTC B2477[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
C1099	Electric power steering oil pump (motor)	(See 06-02-10 DTC C1099[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
C1278	Steering angle sensor	(See 06-02-11 DTC C1278[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
U0073	CAN bus communication error	(See 09-02B-1 MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM].)
U0100	Lost communication with the PCM	(See 09-02B-1 MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM].)
U2023	Fault received from other modules	(See 09-02B-1 MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM].)

PID/DATA Monitor Table

PID Name (Definition)	Unit/ Condition	Condition/Specification	Action	EHPAS control module terminal
CCNT (Number of continuous codes)	—	• DTCs are detected: **1—255** • No DTCs are detected: **0**	Perform inspection using appropriate DTC.	—
ENGRPM (Engine speed signal)	RPM	• Engine speed 1,000 rpm: **1000 RPM**	Inspect the PCM. (See 01-40A-13 PCM INSPECTION[LF, L3].)	—
MTR_AMP (Pump Motor Operation Current)	A	• Indicates pump motor operation current.	Replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)	—
RPM_ACT (Actual pump motor revolution per minutes)	RPM	• Indicates pump motor revolution per minutes.	Replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)	—
RPM_TGT (Target pump motor revolution per minutes)	RPM	• Indicates pump motor target revolution per minutes.	Replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)	—
STEER_RATE (Steering wheel rotation rate)	°/s	• Indicates steering wheel rotation rate.	Inspect steering angle sensor. (See 06-14-27 STEERING ANGLE SENSOR INSPECTION.)	3B, 3D
TEMP_BOARD (Printed circuit board temperature)	°F/°C	• Indicates circuit temperature.	Replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/ INSTALLATION[LF, L3].)	—
VPWR (Module supply voltage)	V	• IG switch ON: **B+**	Inspect the battery. (See 01-17A-4 BATTERY INSPECTION[LF, L3].)	1B, 2F
VSS (Vehicle speed)	KPH/MPH	• Vehicle is stopped: **0 KPH/0 MPH** • Vehicle speed **20 km/h {12 mph}**: **20 KPH/12 MPH**	Inspect the PCM. (See 01-40A-13 PCM INSPECTION[LF, L3].) Inspect the instrument cluster. (See 09-22-4 INSTRUMENT CLUSTER INSPECTION.)	—

DTC B1238[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1800100

DTC B1238	Electro hydraulic power assist steering (EHPAS) control module
DETECTION CONDITION	• Excessive load to electric power steering oil pump
POSSIBLE CAUSE	• Due to the continuously static steering, being turned to the lock end, or other causes, the internal temperature of the electric power steering oil pump is more than the specified value.

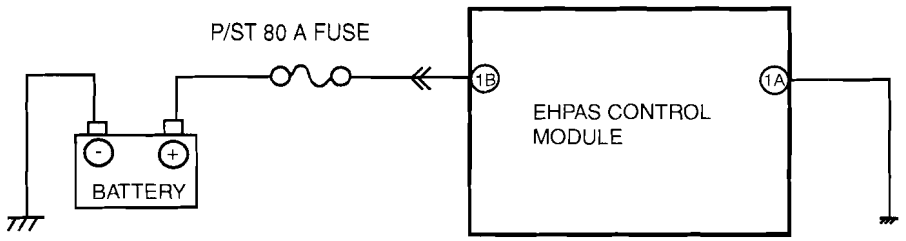
Diagnostic procedure

STEP	INSPECTION		ACTION
1	TURN IGNITION SWITCH OFF AND ALLOW ELECTRIC POWER STEERING OIL PUMP TO COOL DOWN.		
2	VERIFY THAT THE SAME DTC IS NOT PRESENT • Turn the ignition switch to the ON position. • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is the same DTC present?	Yes	Replace the electric power steering oil pump, then go to the next step. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
3	VERIFY THAT NO OTHER DTCS ARE PRESENT • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

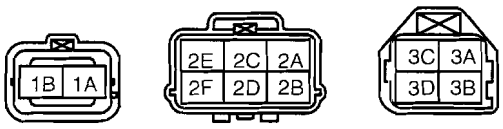
DTC B1317, B1318[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

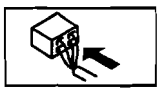
id0602b1800200

DTC B1317, B1318	Battery power supply
DETECTION CONDITION	• Low voltage or high voltage are detected at the voltage monitor.
POSSIBLE CAUSE	• Open or short circuit in wiring harness between electro hydraulic power assist steering (EHPAS) control module terminal 1B and battery positive terminal • Battery and/or generator malfunction



EHPAS CONTROL MODULE HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY VOLTAGE** • Is the battery terminal voltage normal?	Yes	Make sure that battery terminal connection is okay. Go to the next step.
		No	Charge or replace the battery, then go to Step 6.
2	**INSPECT BATTERY GRAVITY** • Is the battery specific gravity as specified?	Yes	Go to the next step.
		No	Replace the battery, then go to Step 6.
3	**INSPECT CHARGING SYSTEM** • Are the generator and drive belt tension normal?	Yes	Go to the next step.
		No	Replace the generator and/or drive belt if necessary. Go to step 6.
4	**INSPECT EHPAS CONTROL MODULE POWER SUPPLY CIRCUIT FOR OPEN OR SHORT CIRCUIT** • Start the engine. • Measure the voltage between following EHPAS control module terminal (wiring harness-side) and ground. — EHPAS control module: 1B—ground • Is the voltage **9 V or more**?	Yes	Go to the next Step.
		No	Repair or replace the wiring harness for open circuit between the EHPAS control module and ground, then go to Step 6.
5	**INSPECT EHPAS CONTROL MODULE GROUND CIRCUIT FOR POOR GROUND OR OPEN CIRCUIT** • Turn the ignition switch off. • Measure the resistance between the following EHPAS control module terminal (wiring harness-side) and ground. — EHPAS control module: 1A—ground • Is the resistance **within 0—1 ohm**?	Yes	Go to the next step.
		No	If there is no continuity: • Repair or replace the wiring harness for open circuit between the EHPAS control module and ground, then go to the next step. If the resistance is not **within 0—1 ohm**: • Repair or replace the wiring harness for poor ground, then go to the next step.
6	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is the same DTC present?	Yes	Replace the electric power steering oil pump, then go to the next step. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
7	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

DTC B1342[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1800300

DTC B1342	Electro hydraulic power assist steering (EHPAS) control module
DETECTION CONDITION	• The EHPAS control module on-board diagnostic function detects system malfunction.
POSSIBLE CAUSE	• EHPAS control module internal malfunction • Poor connection at connectors

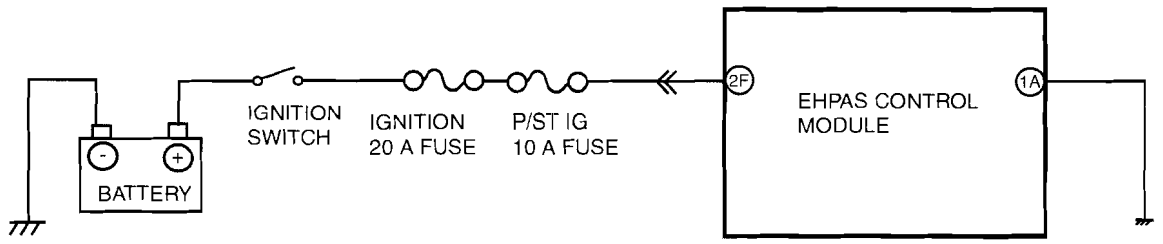
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is the same DTC present?	Yes	Replace the electric power steering oil pump, then go to the next step. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

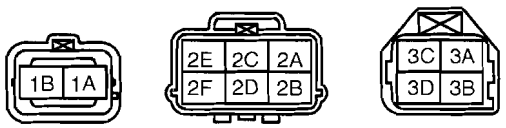
DTC B1352[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

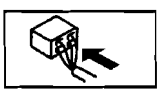
id0602b1800400

DTC B1352	Ignition power supply
DETECTION CONDITION	• **Less than 2.5 V** detected at the voltage monitor of the electro hydraulic power assist steering (EHPAS) control module
POSSIBLE CAUSE	• Short to ground in wiring harness between EHPAS control module terminal 2F and ignition switch • Open circuit in wiring harness between EHPAS control module terminal 2F and ignition switch • Poor connection at connectors



EHPAS CONTROL MODULE HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FUSES** • Are the fuses normal?	Yes	Go to the next step.
		No	Replace the fuses, then go to the step 3.
2	**INSPECT EHPAS CONTROL MODULE POWER SUPPLY CIRCUIT FOR OPEN OR SHORT CIRCUIT** • Start the engine. • Measure the voltage between following EHPAS control module terminal (wiring harness-side) and ground. — EHPAS control module: 2F—ground • Is voltage **10 V or more**?	Yes	Go to the next step.
		No	Repair or replace the harness for open circuit between EHPAS control module and ground, then go to next step.
3	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is same DTC present?	Yes	Replace the electric power steering oil pump, then go to the next step. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
4	**VERIFY THAT NO OTHER DTCs ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	Troubleshooting completed.

DTC B2477[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1801600

DTC B2477	**Electro hydraulic power assist steering (EHPAS) control module configuration**
DETECTION CONDITION	• Configuration setting failure is detected.
POSSIBLE CAUSE	• Module configuration procedure was not completed properly.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY CONFIGURATION** • Has the EHPAS control module configuration been performed?	Yes	Go to the next step.
		No	Perform configuration using the M-MDS. (See 06-14-21 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE CONFIGURATION[LF, L3].)
2	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
3	**VERIFY THAT NO OTHER DTCs ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

DTC C1099[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1800600

DTC C1099	Electric power steering oil pump (motor)
DETECTION CONDITION	• The electro hydraulic power assist steering (EHPAS) control module detects that the motor speed is less than the specified value.
POSSIBLE CAUSE	• Motor internal malfunction

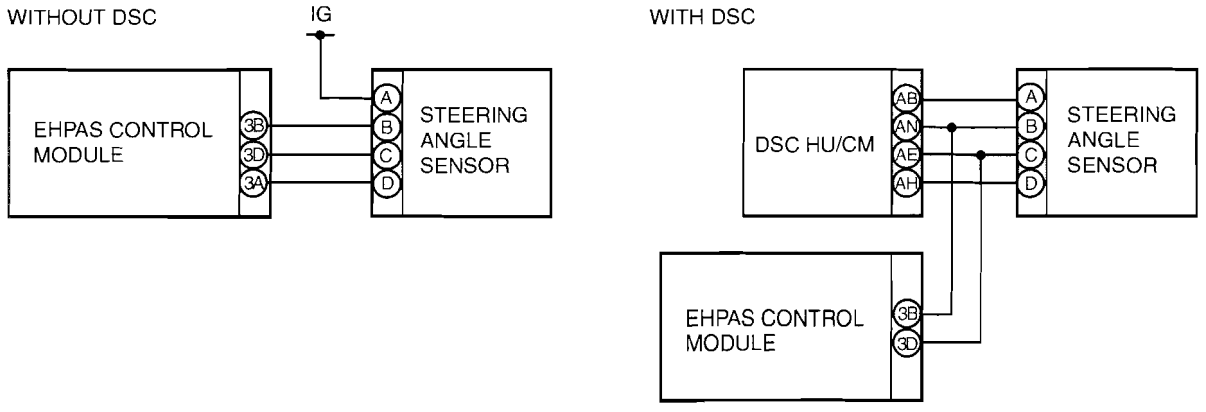
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**REPLACE ELECTRIC POWER STEERING OIL PUMP** • Replace the electric power steering oil pump, then go to the next step. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)		
2	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

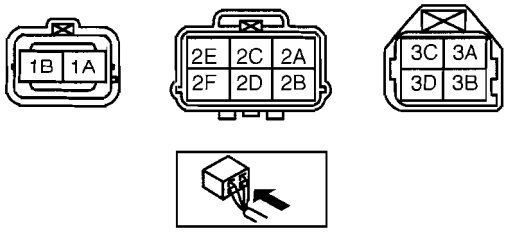
DTC C1278[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0602b1801000

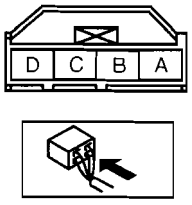
DTC C1278	Steering angle sensor
DETECTION CONDITION	• The EHPAS control module detects that the monitor voltage from the steering angle sensor is **more than 4.9 V** or **less than 0.8 V** • The EHPAS control module detects that the two monitor voltages modulate at the same phase a specified amount of phases or more. • The EHPAS control module detects that the EHPAS sensor signal dose not change.
POSSIBLE CAUSE	• Short to power supply, open circuit, or short to ground in wiring harness between EHPAS control module terminal 3B and steering angle sensor B • Short to power supply, open circuit, or short to ground in wiring harness between EHPAS control module terminal 3D and steering angle sensor terminal C • Open circuit in wiring harness between EHPAS control module terminal 3A and steering angle sensor terminal D (without DSC) • Open circuit in wiring harness between DSC HU/CM terminal AH and steering angle sensor terminal D (with DSC) • Short circuit in wiring harness between steering angle sensor terminal A and D • Steering angle sensor malfunction. • Steering angle sensor ring has fallen off.



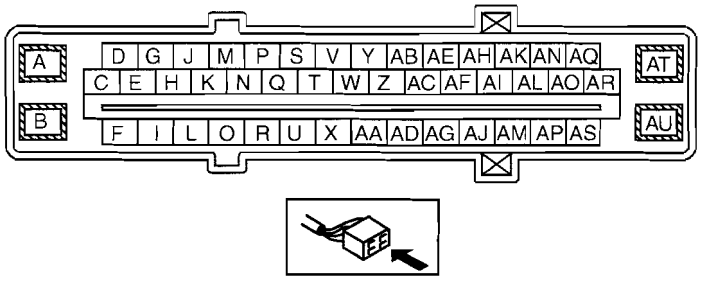
EHPAS CONTROL MODULE HARNESS-SIDE CONNECTOR



STEERING ANGLE SENSOR HARNESS-SIDE CONNECTOR



DSC HU/CM HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PID FOR STEERING ANGLE SENSOR MALFUNCTION USING M-MDS** • Turn the ignition switch off. • Connect the M-MDS to the DLC-2. • Select the "STEER_RATE" PID. • Verify that the M-MDS display changes correctly according to steering wheel operation. • Does it change correctly?	Yes	Go to the next step.
		No	Replace the steering angle sensor. (See 08-10-14 CLOCK SPRING REMOVAL/ INSTALLATION.)
2	**INSPECT POWER SUPPLY VOLTAGE OF STEERING ANGLE SENSOR** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between steering angle sensor terminal A and ground. • Is the voltage **B+**?	Yes	Go to the next step.
		No	Without DSC • Repair or replace the wiring harness between ignition switch and steering angle sensor terminal A, then go to the step 7. With DSC • Repair or replace the wiring harness between DSC HU/ CM terminal AB and steering angle sensor terminal A, then go to the step 7.
3	**INSPECT GROUND CIRCUIT OF STEERING ANGLE SENSOR FOR OPEN CIRCUIT** • Turn the ignition switch off. • Disconnect the EHPAS control module (without DSC) or DSC HU/CM (with DSC) and steering angle sensor connectors. • Inspect for continuity between EHPAS control module terminal 3A (without DSC) or DSC HU/CM terminal AH (with DSC) and steering angle sensor terminal D. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between EHPAS control module terminal 3A (without DSC) or DSC HU/CM terminal AH (with DSC) and steering angle sensor terminal D, then go to the step 7.
4	**INSPECT STEERING ANGLE SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER** • Turn ignition key to ON (engine OFF). • Measure the voltage between the EHPAS control module and body ground at the following: — Sensor 1: EHPAS control module terminal 3B and body ground — Sensor 2: EHPAS control module terminal 3D and body ground • Is voltage **B+**?	Yes	Repair or replace the related wiring harnesses between the EHPAS control module and steering angle sensor, then go to the step 7.
		No	Go to next step.
5	**INSPECT STEERING ANGLE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND** • Turn the ignition switch off. • Inspect continuity between the EHPAS control module and body ground at the following: — Sensor 1: EHPAS control module terminal 3B and body ground — Sensor 2: EHPAS control module terminal 3D and body ground • Is there continuity?	Yes	Repair or replace the related wiring harnesses between the EHPAS control module and steering angle sensor, then go to the step 7.
		No	Go to the next step.
6	**INSPECT SENSORS 1 AND 2 OF THE STEERING ANGLE SENSOR FOR CONTINUITY** • Turn the ignition switch off. • Disconnect the EHPAS control module and steering angle sensor connectors. • Inspect for continuity between steering angle sensor terminals B and C. • Is there continuity?	Yes	Replace the steering angle sensor, then go to the step 7. (See 08-10-14 CLOCK SPRING REMOVAL/ INSTALLATION.)
		No	Go to the next step.

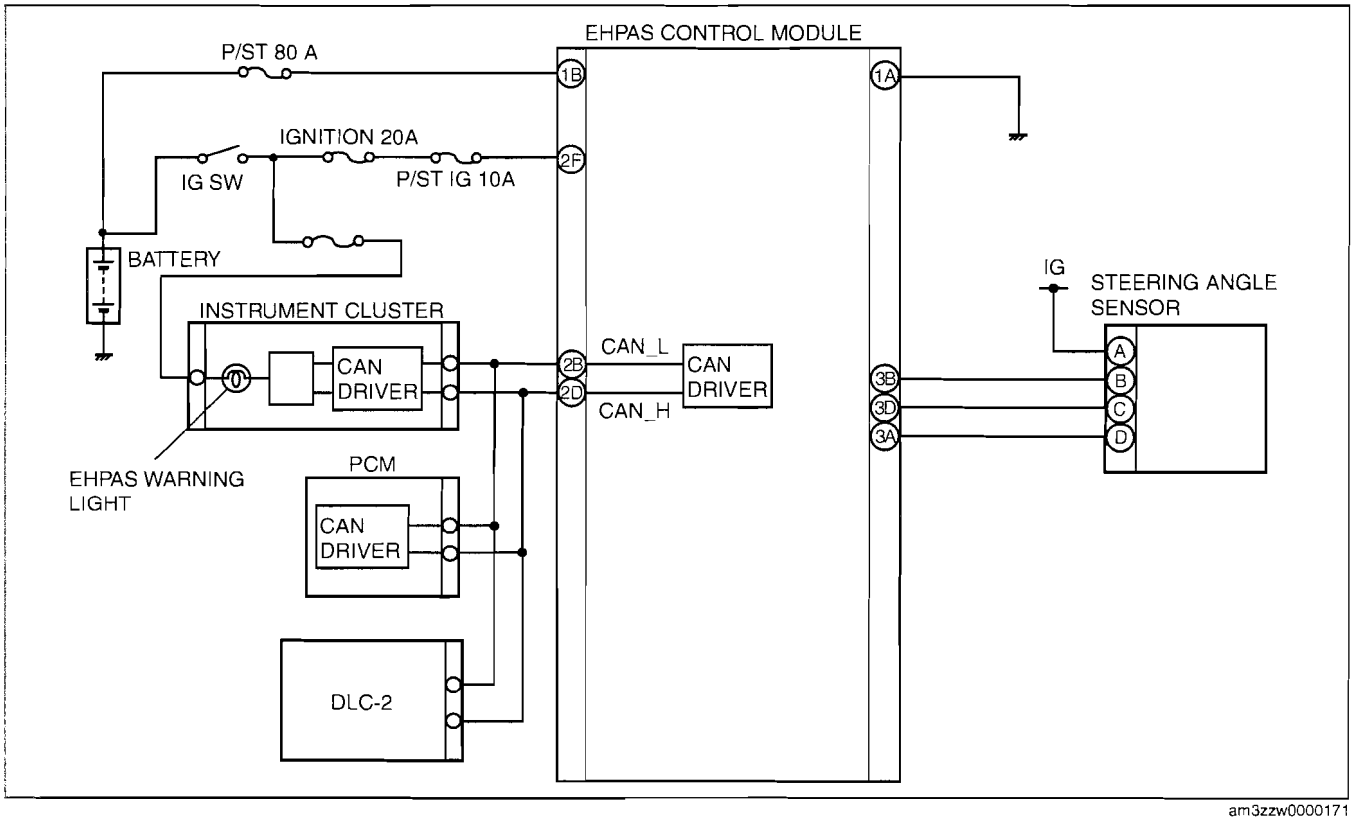
STEP	INSPECTION		ACTION
7	**VERIFY THAT THE SAME DTC IS NOT PRESENT** • Reconnect all disconnected connectors. • Clear the DTC from the memory. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].) • Is the same DTC present?	Yes	• Repeat the inspection from Step 1. • If the malfunction recurs, replace the electric power steering oil pump. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
		No	Go to the next step.
8	**VERIFY THAT NO OTHER DTCS ARE PRESENT** • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
		No	DTC troubleshooting completed.

06-03 SYMPTOM TROUBLESHOOTING [ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

SYSTEM WIRING DIAGRAM[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

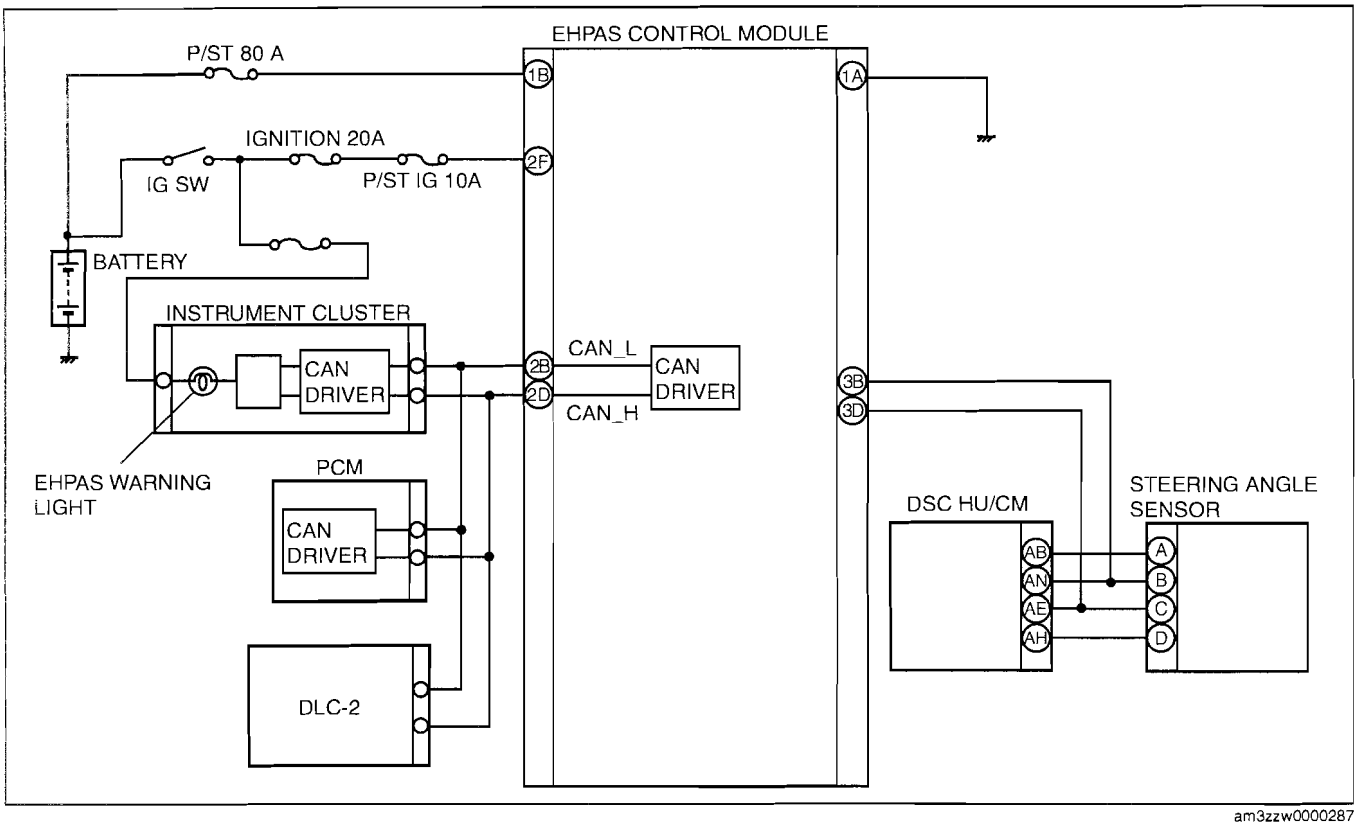
id0603a1800500

Without DSC



am3zzw0000171

With DSC



am3zzw0000287

FOREWORD[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0603a1800100

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To inspect the DTC, follow the DTC Inspection steps. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)

PRECAUTION[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0603a1800300

Intermittent Concern Troubleshooting

Vibration method

- If a malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the following steps.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Inspect the following:
  - — Connectors not fully seated.
  - — Wiring harnesses not having full play.
  - — Wires laying across brackets or moving parts.
  - — Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harness pass through the firewall, body panels and other panels are the major areas to be inspected.

Inspection method for switch and/or sensor connectors or wires

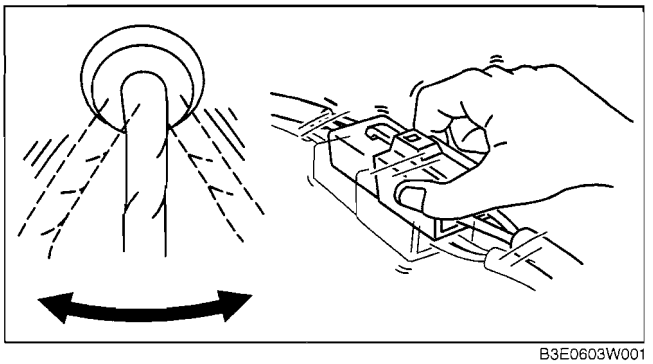
1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (engine off).

Note

- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.

4. Turn the switch on manually.
5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
   - If the PID value is unstable, inspect for poor connection.



B3E0603W001

Inspection method for sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (engine off).

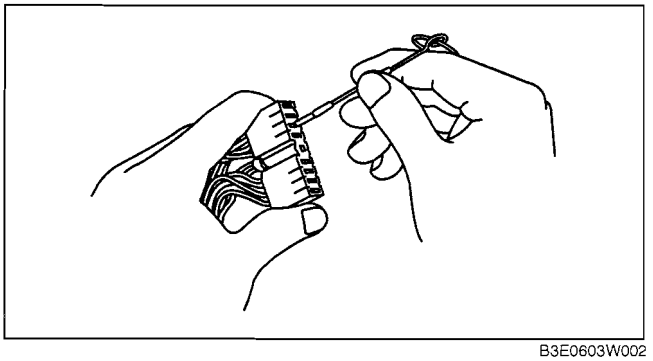
Note

- If the engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
   - If the PID value is unstable or a malfunction occurs, inspect for poor connection and/or poorly mounted sensor.

Connector terminal inspection method

1. Inspect the connection of each female terminal.
2. Insert the male terminal to the female terminal and inspect the female terminal for looseness.



B3E0603W002

SYMPTOM TROUBLESHOOTING[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0603a1800400

- Verify the symptom, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	Poor power steering assist
2	Excessive noise from electric power steering oil pump

NO.1 POOR POWER STEERING ASSIST[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0603a1800200

1	POOR POWER STEERING ASSIST

TROUBLESHOOTING HINTS

- Power steering fluid leakage from electro hydraulic power assist steering (EHPAS) fluid line
- Steering gear and linkage malfunction
- EHPAS control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**RETRIEVE DTC FROM EHPAS CONTROL MODULE** • Are any DTCs present?	Yes	Record all DTC and go to the applicable DTC inspection.
		No	Go to the next step.
2	**INSPECT STEERING WHEEL ASSIST FUNCTION** • Disconnect the EHPAS control module connector (2-pin). • Is the power steering assist function changed?	Yes	Go to the next step.
		No	Visually inspect the steering gear and linkage. Replace it if the malfunction is found.
3	**INSPECT IF THERE IS ANY FLUID LEAK FROM THE EHPAS FLUID LINE** • Is there fluid leakage?	Yes	Replace it if necessary.
		No	Replace the EHPAS control module. (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)

NO.2 EXCESSIVE NOISE FROM ELECTRIC POWER STEERING OIL PUMP[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)]

id0603a1800600

2	Excessive noise from electric power steering pump

TROUBLESHOOTING HINTS

- Air in EHPAS fluid line
- Low power steering fluid level
- Electric power steering oil pump is poor installation
- Mount rubber (on bracket) is deterioration

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT POWER STEERING FLUID LEVEL** • Inspect power steering fluid level when engine is cold. • Is power steering fluid level between MAX and MIN of the reserve tank?	Yes	Go to the next step.
		No	Perform the Fluid Leakage Inspection and add the fluid. (See 06-14-4 POWER STEERING FLUID INSPECTION.)
2	**INSPECT AIR IN EHPAS FLUID LINE** • Perform the air bleed. (See 06-14-4 AIR BLEEDING.) • Is the symptom solved?	Yes	Troubleshooting completed.
		No	Go to next step.
3	**INSPECT ELECTRIC POWER STEERING OIL PUMP INSTALLATION** • Inspect the electric power steering oil pump installation condition. • Is the electric power steering oil pump installed properly?	Yes	Inspect the mount rubber condition. If the mount rubber is deterioration, replace the mount rubber.
		No	Install the electric power steering oil pump properly.

06-10 GENERAL PROCEDURES

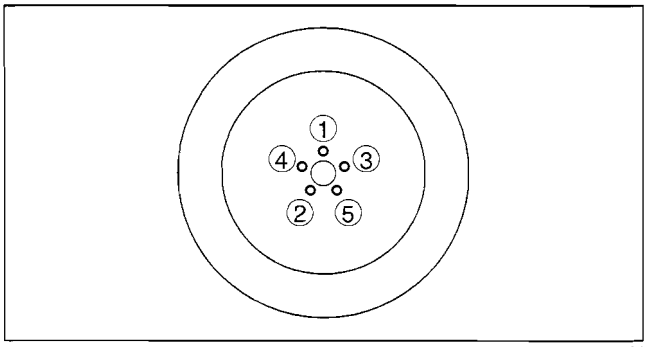
GENERAL PROCEDURES (STEERING)

id061000800100

Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.

   Tightening torque
   88.2—117.6 N·m {9.00—11.99kgf·m, 65.06—86.73 ft·lbf}



am3uuw0000006

Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].) (See 01-17B-2 BATTERY REMOVAL/INSTALLATION[L3 WITH TC].)

Suspension Links Removal/Installation

1. For the joint sections with rubber bushings, raise the vehicle using a lift, and then temporarily tighten the installation bolts and nuts. Lower the vehicle to the ground and tighten them completely with the specified torque.

Power Steering Related Parts Installation

1. If any power steering fluid line has been disconnected, perform the following after installation of the power steering components. (See 04-11-3 AIR BLEEDING.) (See 06-14-4 POWER STEERING FLUID INSPECTION.)
   — Power steering fluid amount inspection
   — Power steering fluid leakage inspection
   — Air bleeding

Electro Hydraulic Power Assist Steering (EHPAS) Related Parts

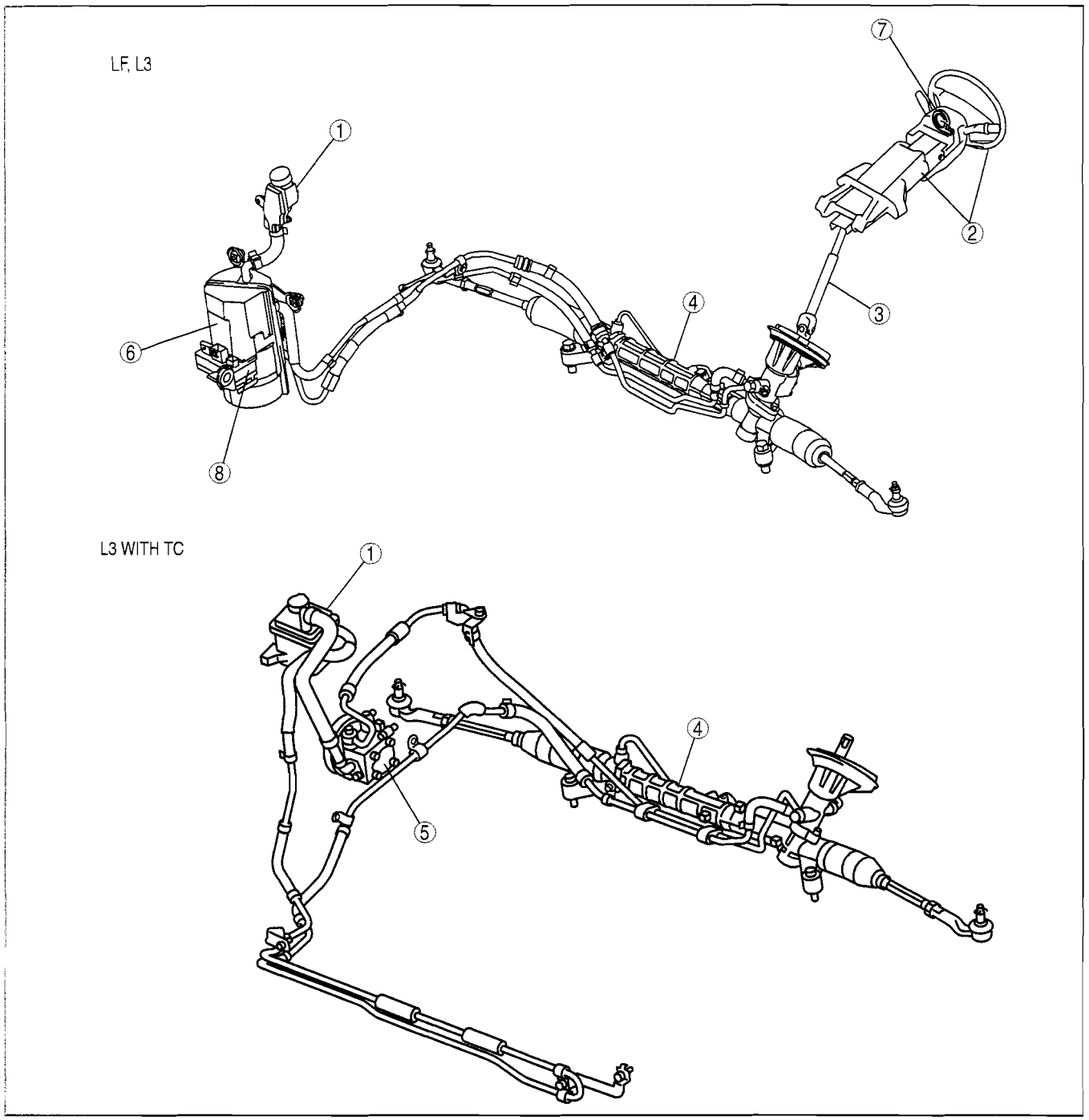
Warning
- **If the configuration procedure is not completed, the EHPAS will not operate properly and it might cause an unexpected accident. Therefore, when replacing or removing the electric power steering oil pump, make sure to perform the configuration procedure to ensure the proper EHPAS operation.**

1. Make sure that there are no DTCs in the EHPAS memory after working on EHPAS related parts. If there are any codes in the memory, clear them.
2. When replacing or removing the electric power steering oil pump, perform the configuration procedures. (See 06-14-21 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE CONFIGURATION[LF, L3].)

06-14 POWER STEERING

STEERING LOCATION INDEX

id061400800100



epu614zw3001

1	Power steering fluid (See 06-14-4 POWER STEERING FLUID INSPECTION.)
2	Steering wheel and column (See 06-14-6 STEERING WHEEL AND COLUMN INSPECTION.) (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
3	Steering shaft (See 06-14-10 STEERING SHAFT INSPECTION.)

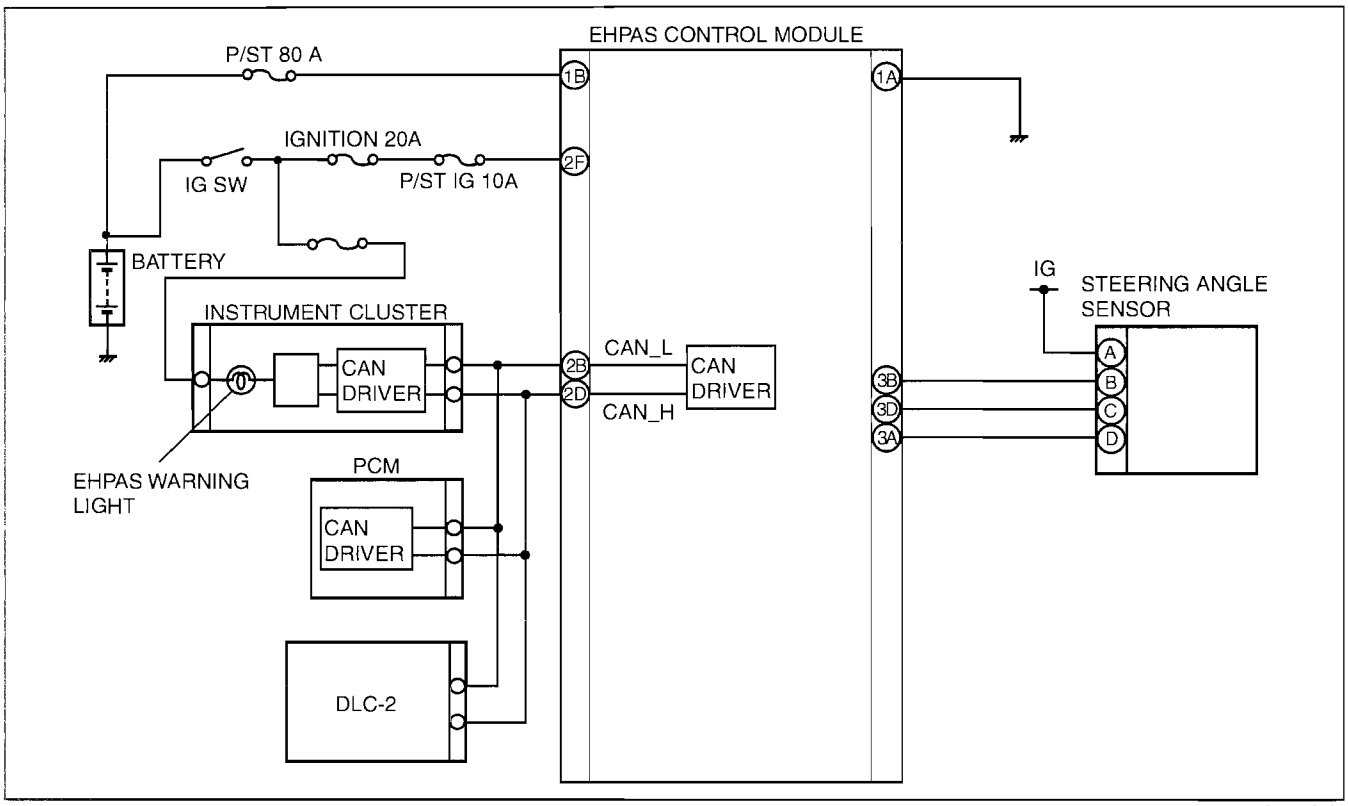
4	Steering gear and linkage (See 06-14-11 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.) (See 06-14-12 STEERING GEAR AND LINKAGE DISASSEMBLY.) (See 06-14-15 STEERING GEAR AND LINKAGE INSPECTION.) (See 06-14-16 STEERING GEAR AND LINKAGE ASSEMBLY.)
5	Power steering oil pump (L3 WITH TC) (See 06-14-23 POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC].) (See 06-14-24 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY[L3 WITH TC].)

6	Electric power steering oil pump (LF, L3) (See 06-14-21 ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3].)
7	Steering angle sensor (LF, L3) (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.) (See 06-14-27 STEERING ANGLE SENSOR INSPECTION.)
8	EHPAS control module (LF, L3) (See 06-14-22 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE INSPECTION[LF, L3].) (See 06-14-21 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE CONFIGURATION[LF, L3].)

ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) SYSTEM WIRING DIAGRAM

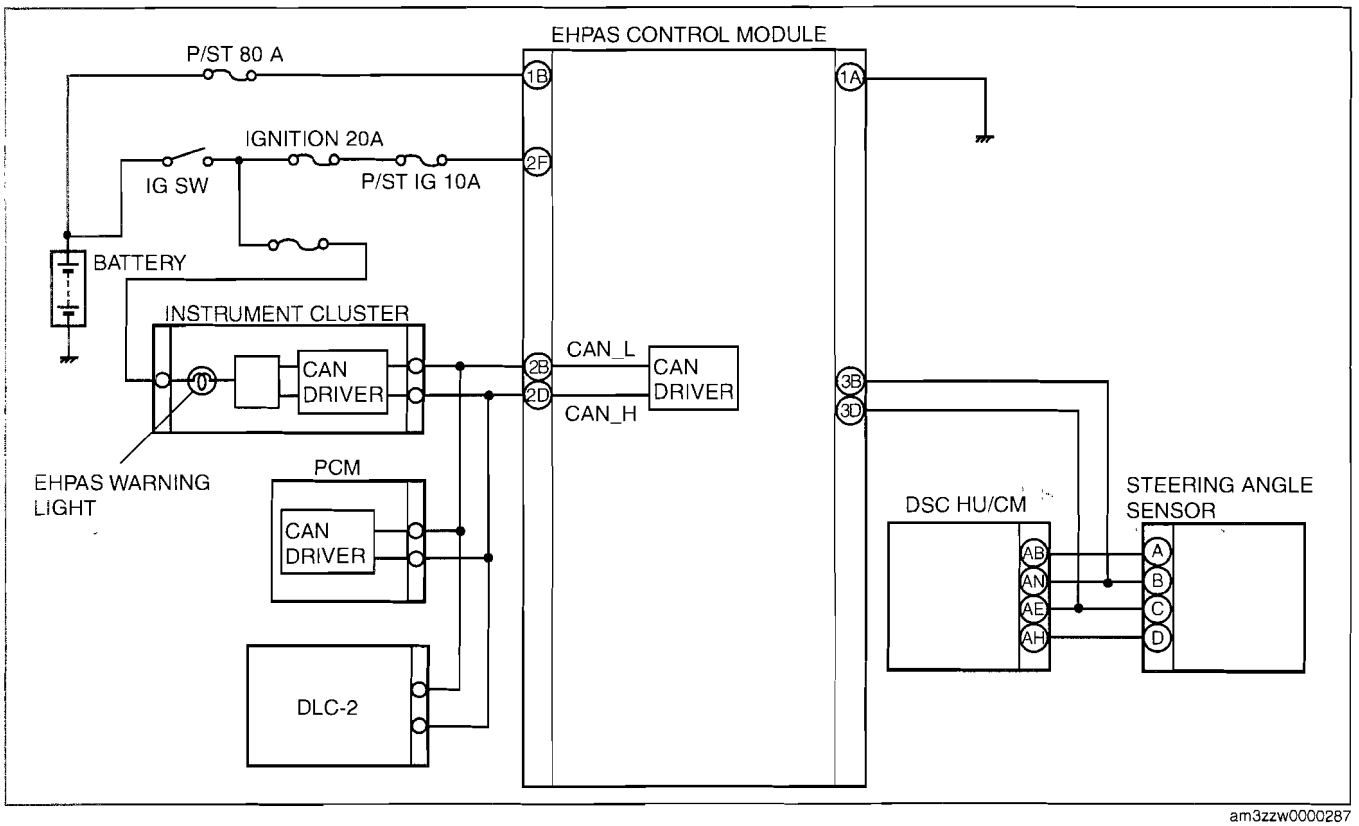
id061400803100

Without DSC



e3u602zw6101

With DSC



am3zzw0000287

AIR BLEEDING

id061400800200

Caution

- **Do not maintain the steering wheel fully turned for 5 s or more. It is possible that oil temperature can rise and this will negatively affect the oil pump.**

1. Inspect the fluid level. (See 06-14-4 POWER STEERING FLUID INSPECTION.)
2. Turn the steering wheel fully to the left and right several times.
3. Reinspect the fluid level.
   - If the fluid level has dropped, add fluid.
4. Repeat Steps 2—3 until the fluid level stabilizes.
5. Start the engine and let it idle.
6. Turn the steering wheel fully to the left and right several times.
7. Repeat Step 6 until the fluid is not foamy and the fluid level has not dropped.
8. Inspect the fluid level, and If the fluid level has dropped, add fluid to a level between MAX and MIN of the reserve tank.

POWER STEERING FLUID INSPECTION

id061400800500

Fluid Level Inspection

1. Verify that the fluid level is between MAX and MIN of the reserve tank when the engine is cold.
   - If the fluid is not at the specified level, adjust the fluid level (MIN-MAX on reserve tank) by adding/draining the fluid.

Power steering fluid type
ATF M-III or equivalent (e.g. Dexron ® II)

Power steering fluid capacity (approximate quantity)
LF, L3: 0.8 L {0.9 US qt, 0.7 Imp qt}
L3 WITH TC: 1.10 L {1.16 US qt, 0.96 Imp qt}

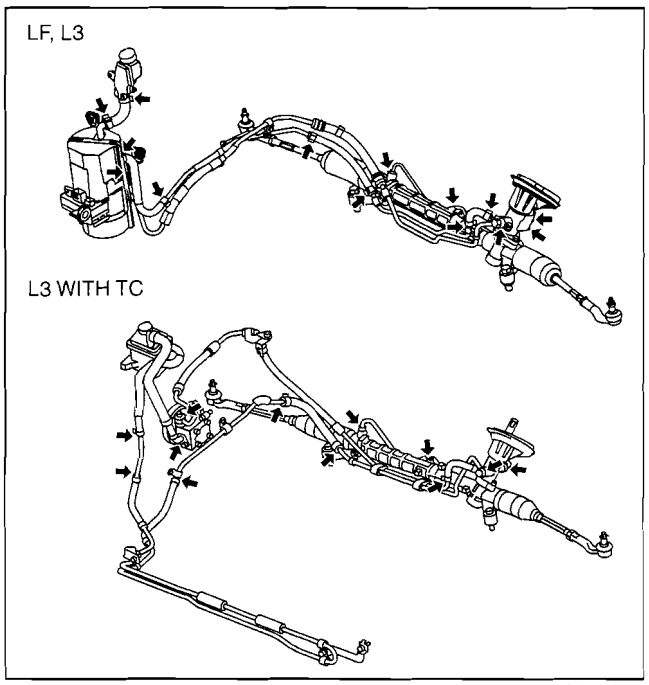
Fluid Leakage Inspection

1. Start the engine and idle it.
2. Turn the steering wheel fully to left or right, to generate the fluid pressure.

Caution

- **Do not maintain the steering wheel fully turned for 5 s or more. It is possible that oil temperature can rise and this will negatively affect the oil pump.**

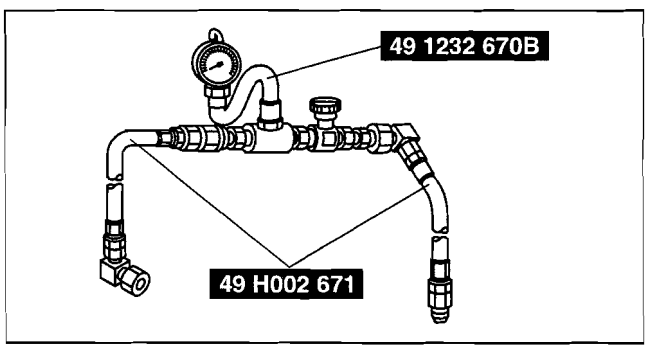
3. Inspect for the fluid leakage at the points indicated in the figure.
   - If fluid leakage is found, repair the related parts.



epu614zw3002

Fluid Pressure Inspection (L3 WITH TC)

1. Set the **SSTs** so that the valve of the **SST** faces toward the gear housing side as shown in the figure.

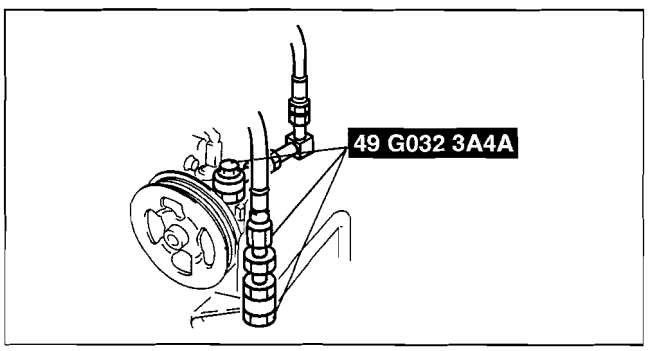


am3uuw0000005

2. Disconnect the oil pump side joint of the pressure hose, connect the **SSTs** set in the Step 1.

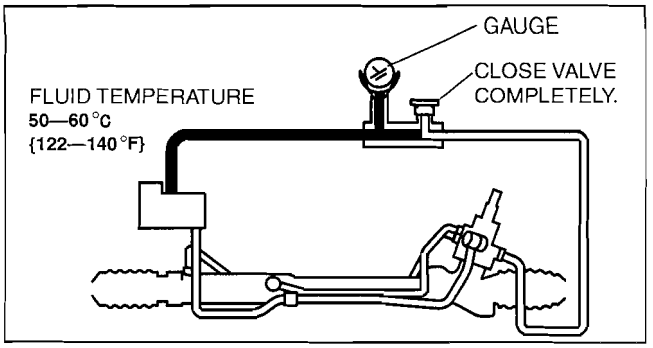
   Tightening torque
   29.4—44.1 N·m {3.00—4.49 kgf·m, 21.6—32.5 ft·lbf}

3. Bleed the air from the system.
4. Open the gauge valve fully.
5. Start the engine, turn the steering wheel to the left and right to raise the power steering fluid to the appropriate temperature (**50—60 °C {122—140 °F}**).



am3uuw0000005

6. Close the gauge valve fully.
7. Increase the engine speed to **1,000—1,500 rpm** and measure the fluid pressure generated at the oil pump.
   - If it is less than the specification, replace the oil pump as a single unit.

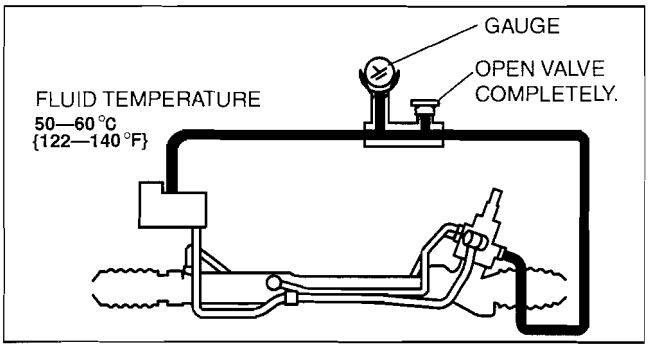


am3uuw0000005

Caution
- **Do not maintain the gauge valve fully closed for 5 s or more. It is possible that oil temperature can rise and this will negatively affect the oil pump.**

Oil pump fluid pressure (oil temperature 50—60 °C {122—140 °F})
9.7—10.2 MPa {99.0—104.0 kgf/cm^2, 1,407—1,479 psi}

8. Open the gauge valve fully and increase the engine speed to **1,000—1,500 rpm**.
9. Turn the steering wheel fully to the left and right, then measure the fluid pressure generated at the gear housing.



am3uuw0000005

Caution
- **Do not maintain the steering wheel fully turned for 5 s or more. It is possible that oil temperature can rise and this will negatively affect the oil pump.**

Note
- If the fluid pressure is less than the specification, it is possible that the oil pump or gear housing is not operating correctly. Replace the oil pump as a single unit.

Gear housing fluid pressure (oil temperature 50—60 °C {122—140 °F})
9.7—10.2 MPa {99.0—104.0 kgf/cm^2, 1,407—1,479 psi}

10. After removing the **SSTs**, tighten the oil pump side joint of the pressure hose to the specified torque.

Tightening torque
29.4—44.1 N·m {3.00—4.49 kgf·m, 21.7—32.5 ft·lbf}

11. Bleed the air from the system.

STEERING WHEEL AND COLUMN INSPECTION

id061400800300

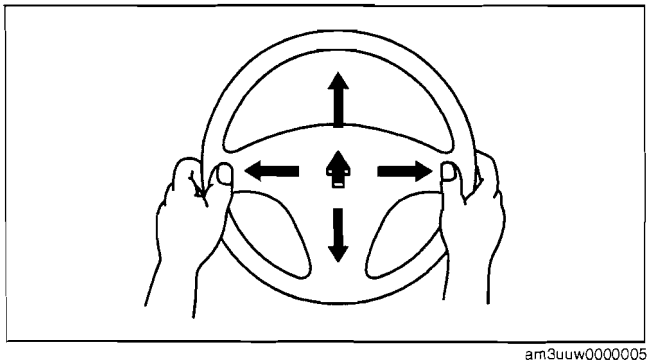
Play Inspection

1. With the wheels in the straight-ahead position, start the engine.
2. Turn the steering wheel to the left and right gently, then verify that the steering wheel play is within the specification.

Steering wheel play
0—30 mm {0—1.18 in} (When hydraulic operating)

Looseness, Excessive Play Inspection

1. Inspect the steering wheel for looseness or excessive play in the axial direction of the shaft and four locations around the steering wheel.
   - If there is any malfunction, inspect the following, and repair or replace the applicable part.
     — Column bearing wear
     — Looseness of the steering wheel installation part
     — Looseness of the column installation area
     — Excessive play of the steering shaft joint
     — Excessive play of the steering gear



am3uuw0000005

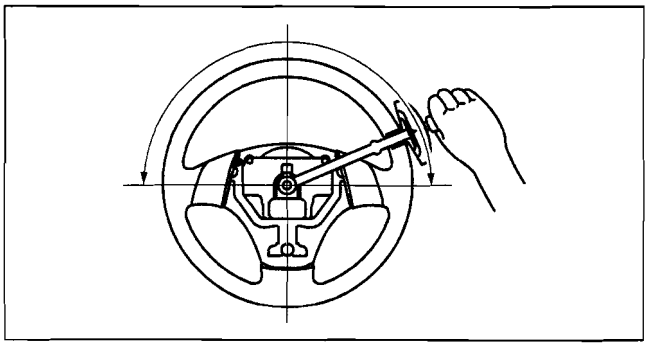
Steering Force Inspection

1. Verify that the equipped tire size and tire air pressure is as specified.
2. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.

Warning

- **Handling the air bag module improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the service warnings before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

3. Remove the air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4. Start the engine and idle it.
5. Verify that the EHPAS warning light does not illuminate.
6. Inspect the steering force using a torque wrench.
   - If not within the specification, verify the following:
     — No air in steering system
     — No fluid leakage at hose or connectors
     — Function of oil pump and steering gear



am3uuw0000005

Steering wheel force (reference value)
7.8 N·m {80 kgf·cm, 69 in·lbf} or less

Note

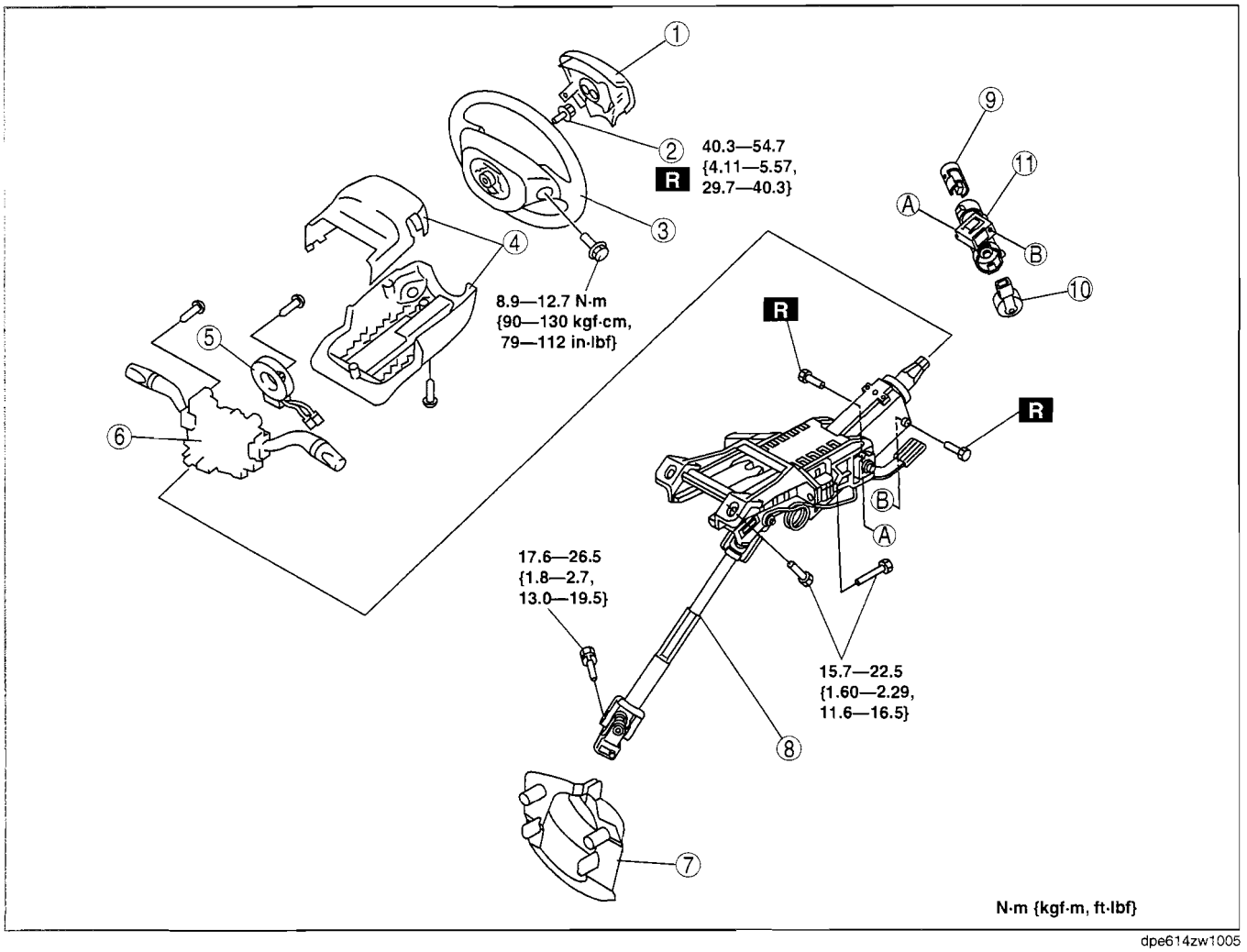
- Comparing another vehicle of the same model under the same conditions is an acceptable inspection method.
- The steering force varies with conditions indicated below.
  — Road conditions: Such as dry, wet, asphalt, or concrete
  — Tire condition: such as brand, wear, and tire pressure

STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION

id061400800400

Warning

- **Handling the air bag module improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the service warnings before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**



dpe614zw1005

1	Air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2	Lockbolt
3	Steering wheel (See 06-14-9 Steering Wheel Removal Note.) (See 06-14-10 Steering Wheel Installation Note.)
4	Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
5	Clock spring (containing steering angle sensor) (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)
6	Combination switch (See 09-18-19 COMBINATION SWITCH REMOVAL/INSTALLATION.)

7	Dust cover
8	Steering shaft (See 06-14-10 Steering Shaft Installation Note.)
9	Outer cylinder (See 06-14-9 Outer Cylinder Removal Note.)
10	Ignition switch (See 09-21-1 IGNITION SWITCH REMOVAL/INSTALLATION.)
11	Steering lock component (See 06-14-9 Steering Lock Component Removal Note.) (See 06-14-9 Steering Lock component Installation Note.)

Steering Wheel Removal Note

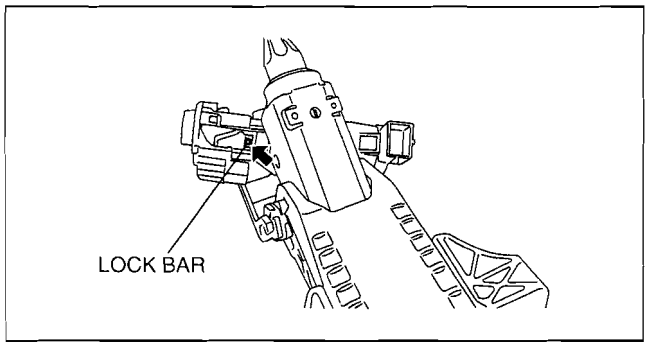
Caution

- **Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will be damaged.**

1. Set the wheels in the straight-ahead position.
2. Remove the steering wheel using any commercially available puller.

Outer Cylinder Removal Note

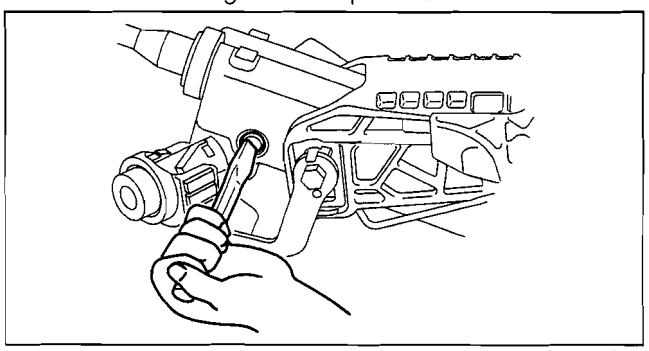
1. Insert the key into the key cylinder and turn it to the ACC position.
2. Insert a pin from the position indicated by the arrow in the figure, and while pressing the lock bar with the pin, remove the key cylinder from the steering lock component.



am3uuw0000006

Steering Lock Component Removal Note

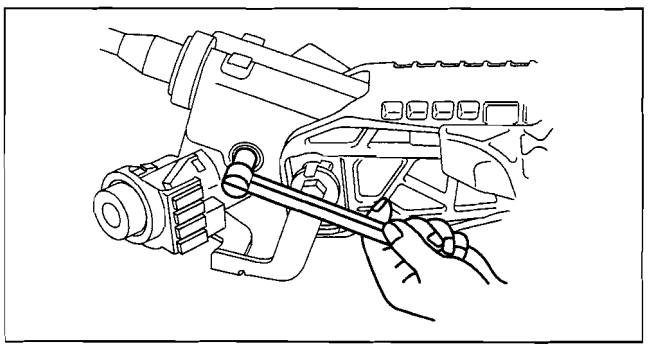
1. Remove the bolt using a flathead screwdriver, and then remove the steering lock component.
2. Make a groove in the heads of the steering lock mounting bolts using a chisel and hammer.
3. Remove the steering lock component.



am3uuw0000041

Steering Lock component Installation Note

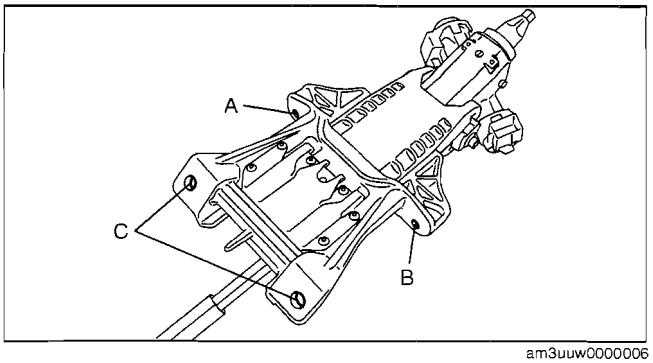
1. Install the steering lock component to the steering shaft.
2. Verify that the lock operates correctly.
3. Install new steering lock mounting bolts.
4. Tighten the bolts until the heads break off.



am3uuw0000006

Steering Shaft Installation Note

1. Verify that the tilt / telescope lever is in the LOCK position.
2. Tighten the bolts in alphabetical order.



am3uuw0000006

Steering Wheel Installation Note

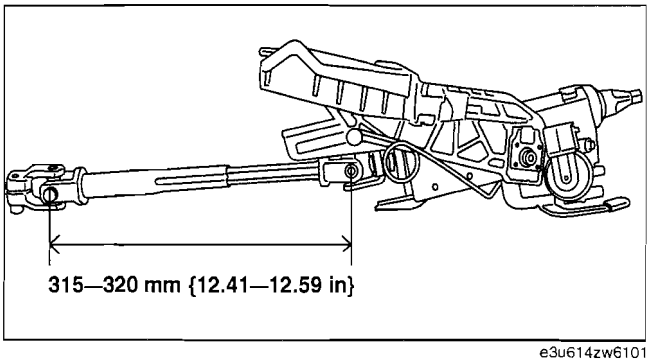
1. Set the wheels in the straight-ahead position and install the steering wheel.

STEERING SHAFT INSPECTION

id061400800600

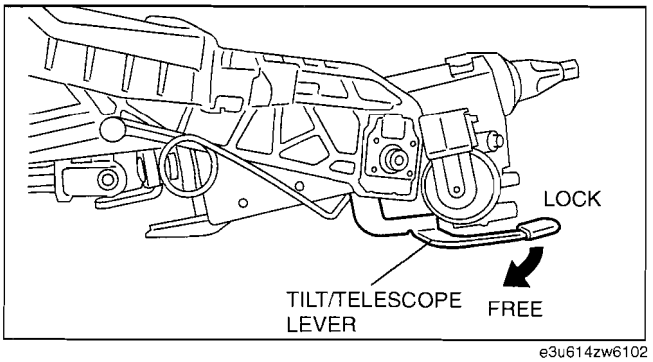
1. Inspect the column bearing for excessive play and damage.
2. Verify that the measurement of the steering shaft indicated in the figure is as specified.
   - If not within the specification replace the steering shaft component.

   Steering shaft length
   315—320 mm {12.41—12.59 in}



e3u614zw6101

3. Inspect the tilt/telescope mechanism operation for the following.
   (1) Tilt/telescope lever moves smoothly from the lock to the unlock position.
   (2) Steering shaft is fixed firmly when the tilt/ telescope lever is locked.
      - If there is any malfunction, replace the steering shaft.



e3u614zw6102

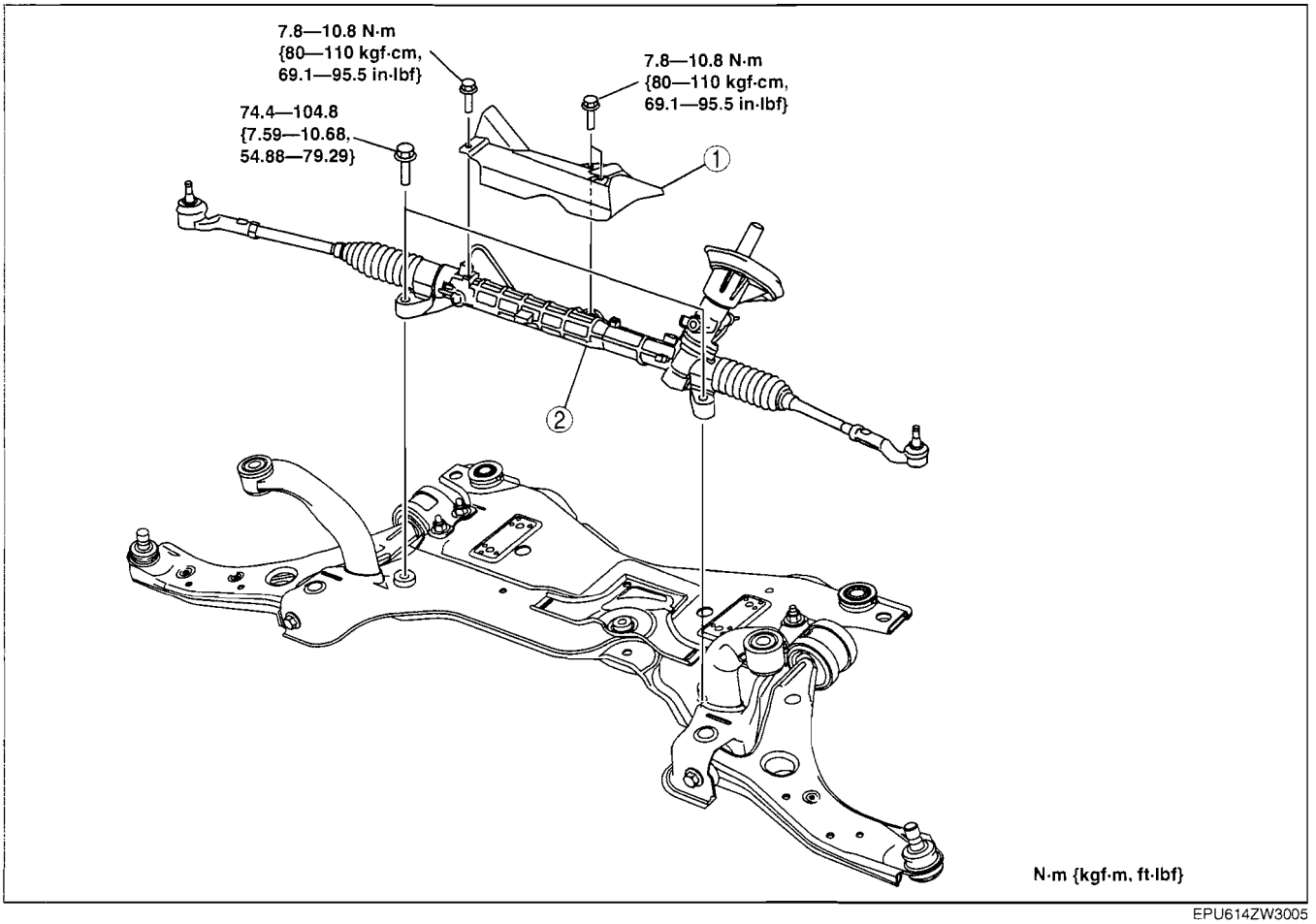
STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION

id061400800900

Caution

- **Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor connector (axle side) and fix the wiring harness to an appropriate place where it will not be pulled by mistake while servicing the vehicle.**

1. Remove the front crossmember, lower arm, front stabilizer, and steering gear and linkage as a single unit. (See 02-13-14 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
2. Remove the front stabilizer from the crossmember component. (See 02-13-11 FRONT STABILIZER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. After installation, inspect the front wheel alignment and adjust it if necessary. (See 02-11-2 FRONT WHEEL ALIGNMENT.)



EPU614ZW3005

1	Insulator	2	Steering gear and linkage

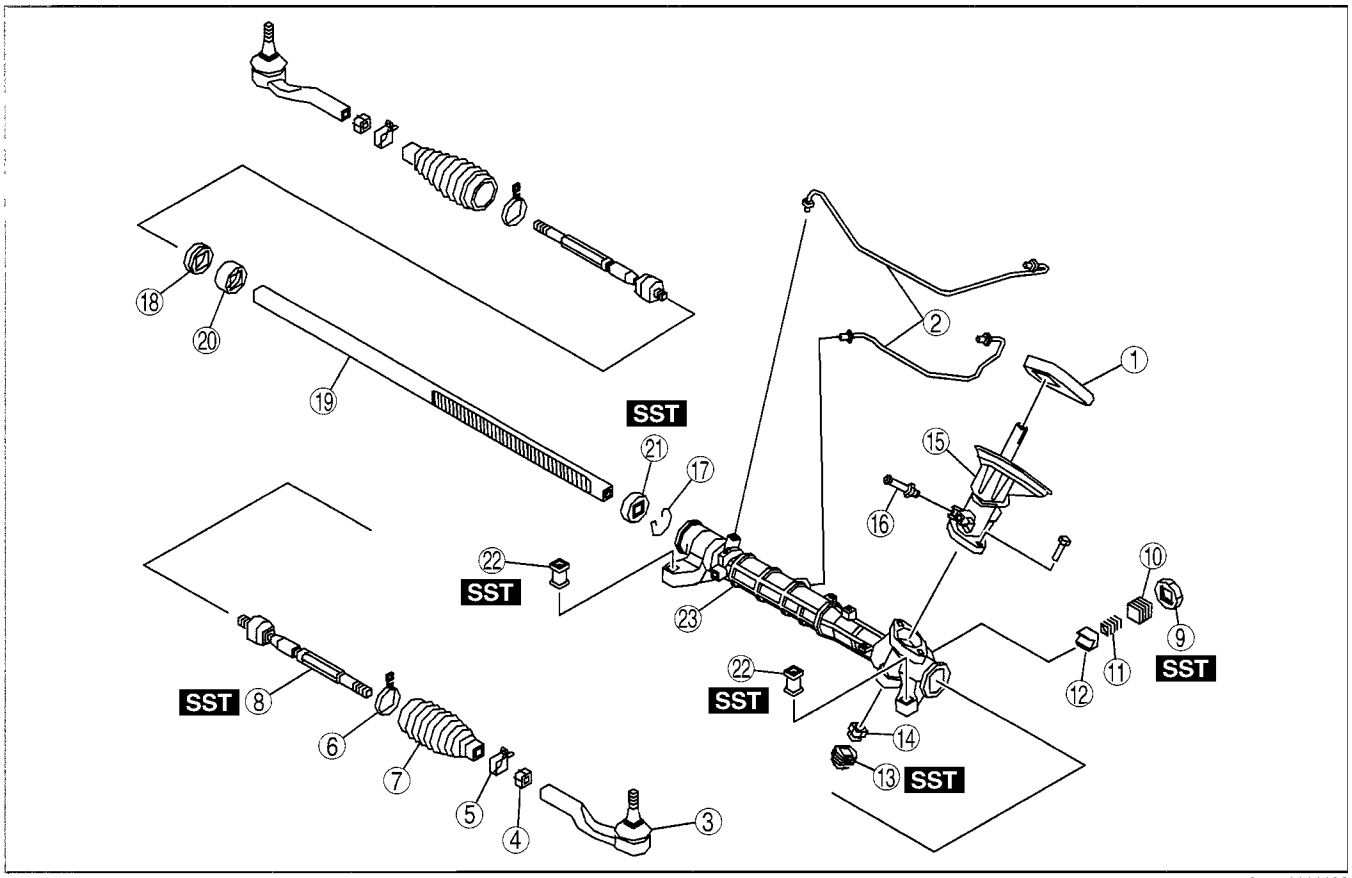
STEERING GEAR AND LINKAGE DISASSEMBLY

id061400801000

Caution

- **Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.**

1. Disassemble in the order indicated in the table.



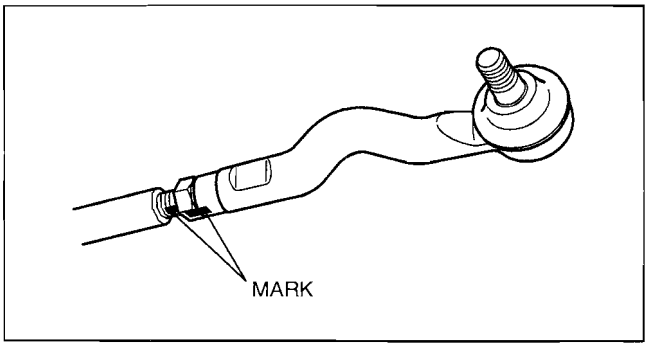
am3uuw0000092

1	Floor seal
2	Oil pipe
3	Tie-rod end (See 06-14-13 Tie-rod End Disassembly Note.)
4	Locknut
5	Boot clamp
6	Boot band
7	Boot
8	Tie rod (See 06-14-13 Tie Rod Disassembly Note.)
9	Locknut (on adjusting cover) (See 06-14-13 Locknut (on Adjusting Cover), Adjusting Cover Disassembly Note.)
10	Adjusting cover (See 06-14-13 Locknut (on Adjusting Cover), Adjusting Cover Disassembly Note.)
11	Yoke spring

12	Support yoke
13	Housing cover
14	Locknut (on pinion shaft)
15	Pinion shaft and valve housing component
16	Return pipe
17	Clip
18	Stopper
19	Steering rack
20	Rack bushing
21	Oil seal (See 06-14-14 Oil Seal Disassembly Note.)
22	Mounting rubber (See 06-14-14 Mounting Rubber Disassembly Note.)
23	Gear housing

Tie-rod End Disassembly Note

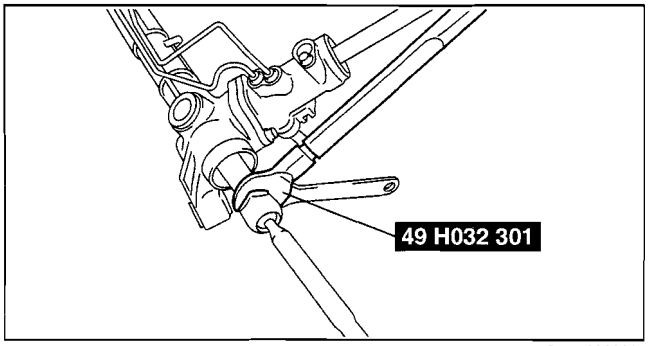
1. Place alignment marks as shown in the figure for proper installation.



am3uuw0000092

Tie Rod Disassembly Note

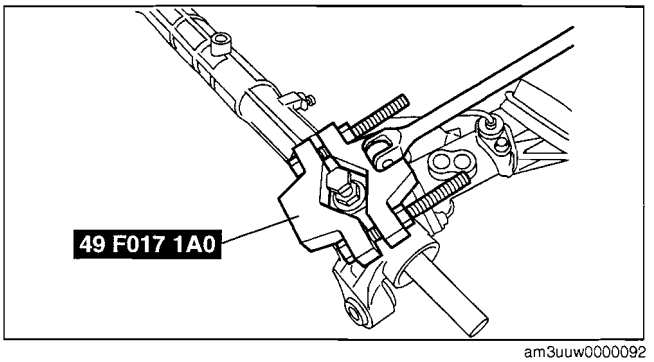
1. Fix the steering rack and remove the tie rod using the **SST**.



am3uuw0000092

Locknut (on Adjusting Cover), Adjusting Cover Disassembly Note

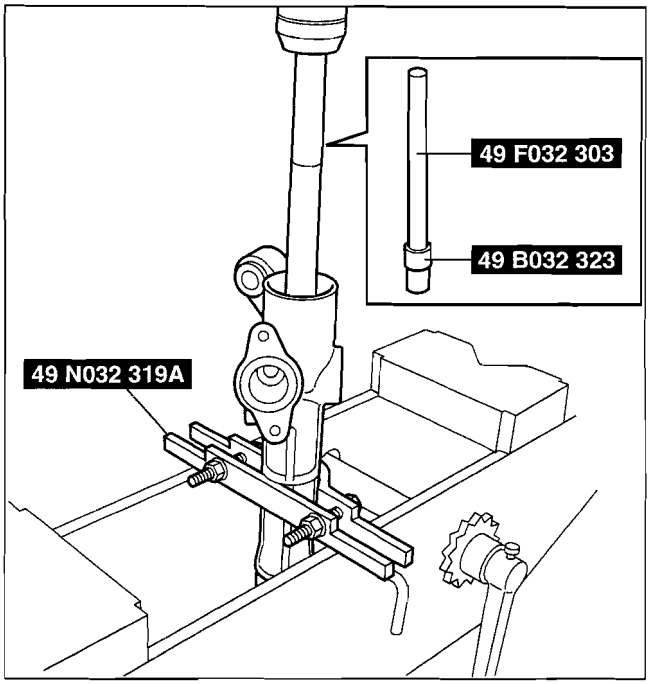
1. Remove the locknut using the **SST**.
2. Remove the adjusting cover.



am3uuw0000092

Oil Seal Disassembly Note

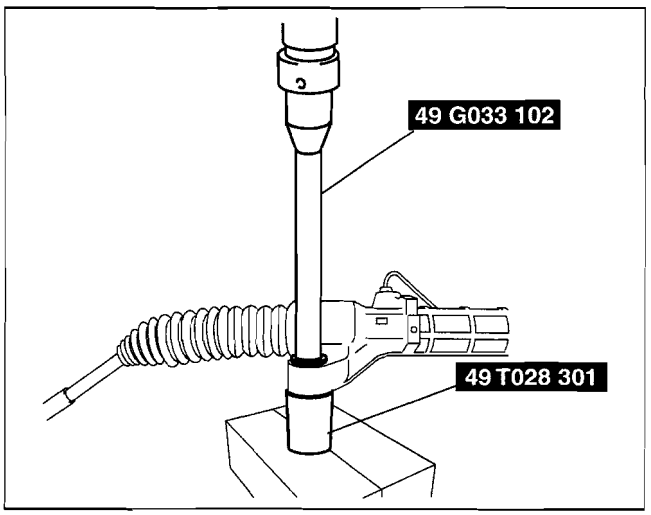
1. Install the **SST** (49 N032 319A) to the gear housing with the raised part facing up as shown in the figure.
2. Insert the **SSTs** (49 F032 303, 49 B032 323) into the valve housing side.
3. Remove the oil seal using a press.



am3uuw0000092

Mounting Rubber Disassembly Note

1. Press the mounting rubber out from the gear housing using the **SSTs** and a press.



am3uuw0000092

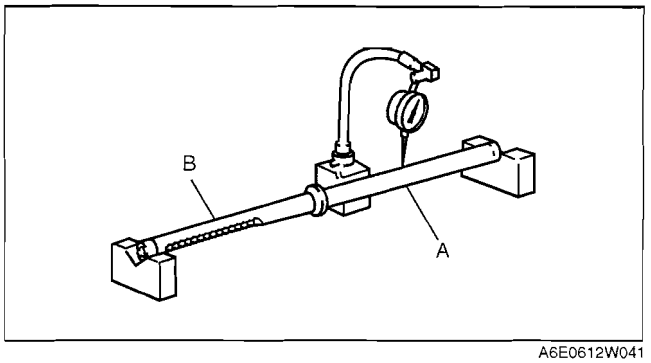
STEERING GEAR AND LINKAGE INSPECTION

id061400801100

Steering Rack Inspection

1. Inspect for cracking, damage, and tooth wear.
   - If there is any malfunction, replace the steering rack.
2. Measure the steering rack warp.
   - If it exceeds the maximum specification, replace the steering rack.

Steering rack runout
Large diameter portion (near point A): 0.15 mm {0.006 in} max.
Small diameter portion (near point B): 0.20 mm {0.008 in} max.

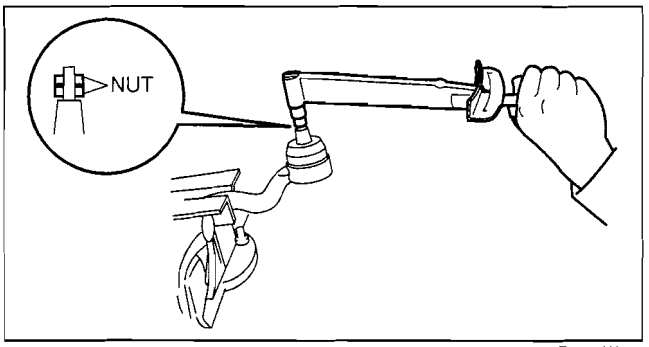


A6E0612W041

Tie-rod End Inspection

1. Inspect the tie-rod end for damage and the boot for cracks.
   - If there is any malfunction, replace the tie-rod end.
2. Inspect for excessive play.
   - If there is any malfunction, replace the tie-rod end.
3. Rotate the ball joint **10 times**.
4. Install two nuts to the ball joint and measure the tie-rod end rotational torque using a torque wrench.
   - If not within the specification, replace the tie-rod end.

Tie-rod end rotational torque
0.5—3.0 N·m {6—30 kgf·cm, 5—26 in·lbf}

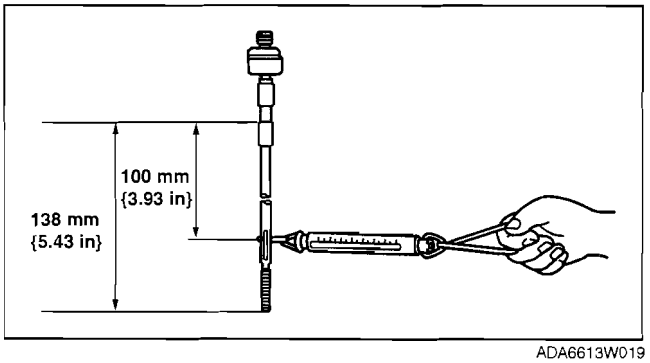


B3E0614W046

Tie rod Inspection

1. Inspect for bending and damage.
   - If there is any malfunction, replace the tie rod.
2. Inspect for excessive play.
   - If there is any malfunction, replace the tie rod.
3. Swing the ball joint **10 times**.
4. Measure the ball joint swing torque using a pull scale.
   - If it exceeds the specification, replace the tie rod.

Tie rod swing torque
0.4—4.0 N·m {5—40 kgf·cm, 4—35 in·lbf}
[Pull scale reading 0.6—29.3 N {0.06—2.98 kgf, 0.14—6.58 lbf}]



ADA6613W019

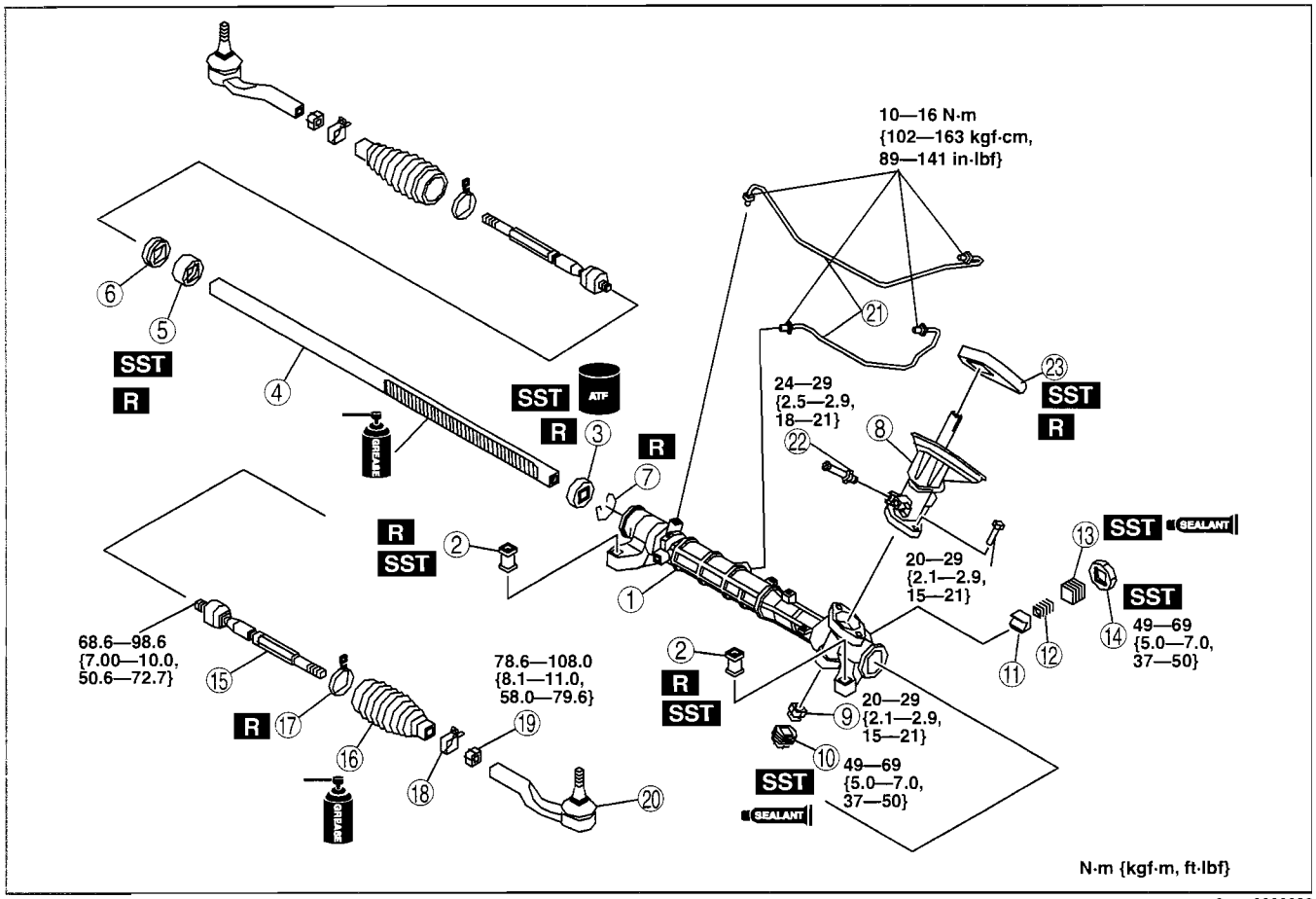
STEERING GEAR AND LINKAGE ASSEMBLY

id061400801200

Caution

- **Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.**

1. Assemble in the order indicated in the table.



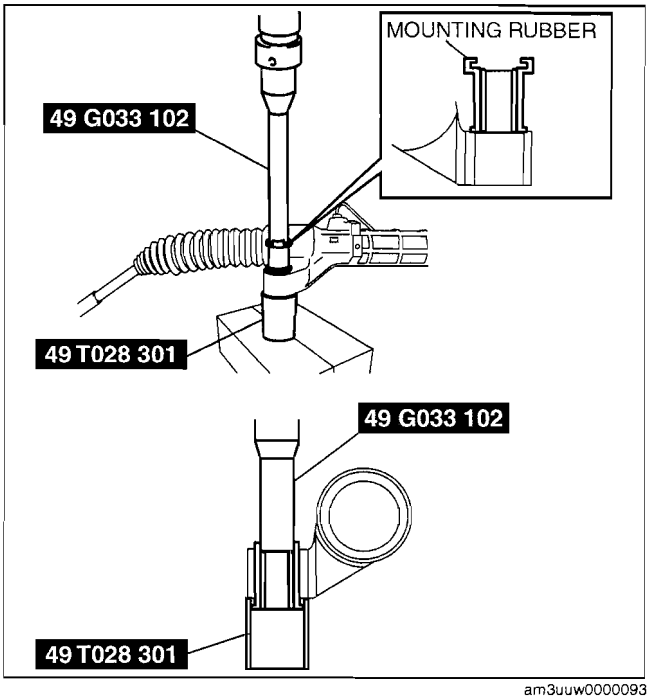
am3uuw0000093

1	Gear housing
2	Mounting rubber (See 06-14-17 Mounting Rubber Assembly Note.)
3	Oil seal (See 06-14-18 Oil Seal Assembly Note.)
4	Steering rack (See 06-14-18 Steering Rack Assembly Note.)
5	Rack bushing (See 06-14-18 Rack Bushing Assembly Note.)
6	Stopper (See 06-14-19 Stopper Assembly Note.)
7	Clip
8	Pinion shaft and valve housing component (See 06-14-19 Pinion Shaft and Valve Housing Component Assembly Note.)
9	Locknut
10	Housing cover (See 06-14-19 Housing Cover Assembly Note.)

11	Support yoke
12	Yoke spring
13	Adjusting cover (See 06-14-19 Adjusting Cover Assembly Note.)
14	Locknut (on adjusting cover) (See 06-14-20 Locknut (on Adjusting Cover) Assembly Note.)
15	Tie rod
16	Boot (See 06-14-20 Boot Assembly Note.)
17	Boot band
18	Boot clamp
19	Locknut
20	Tie-rod end
21	Oil pipe
22	Return pipe
23	Floor seal (See 06-14-20 Floor Seal Assembly Note.)

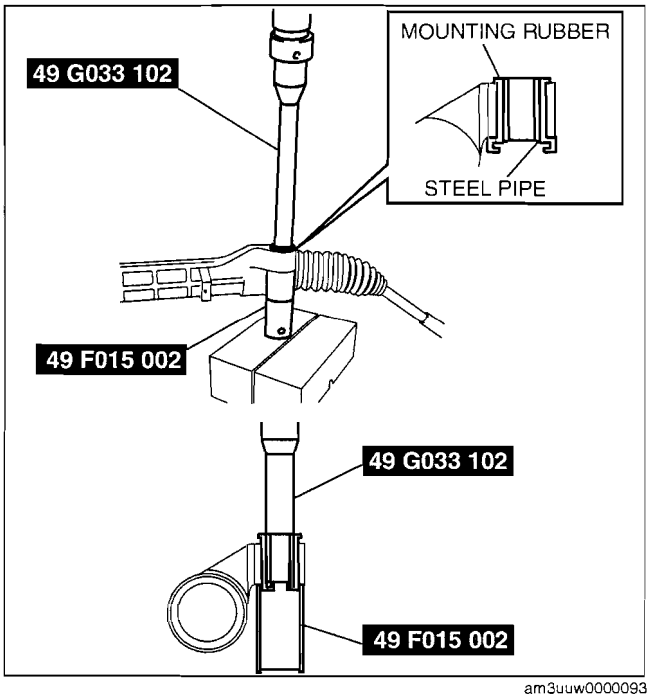
Mounting Rubber Assembly Note

1. Apply soapy water to the rubber part of the mounting rubber.
2. Install the mounting rubber so that two notches of the mounting rubber are parallel to the steering rack.
3. Press the mounting rubber until the mounting rubber end comes out completely from the gear housing using the **SSTs** and a press.



am3uuw0000093

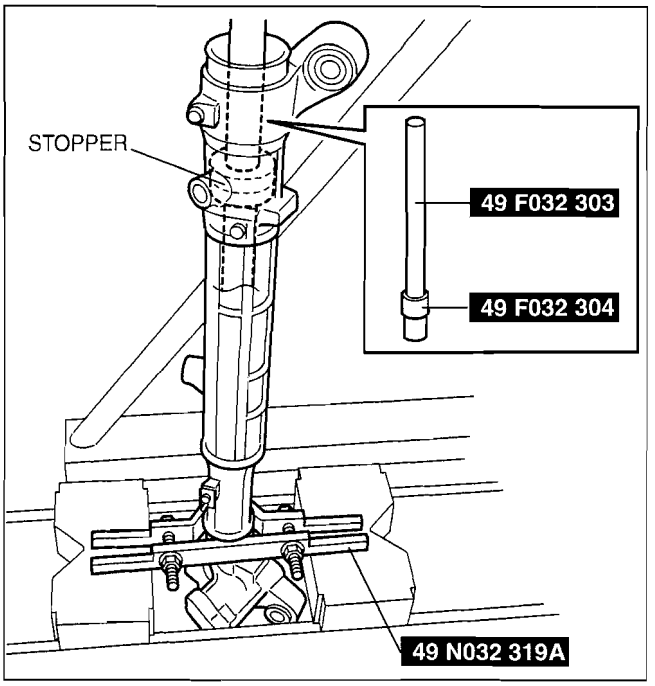
4. Reverse the gear housing, then press the mounting rubber until the mounting rubber end comes out completely from the other side. At this time, make sure that the mounting rubber and steel pipe are aligned.



am3uuw0000093

Oil Seal Assembly Note

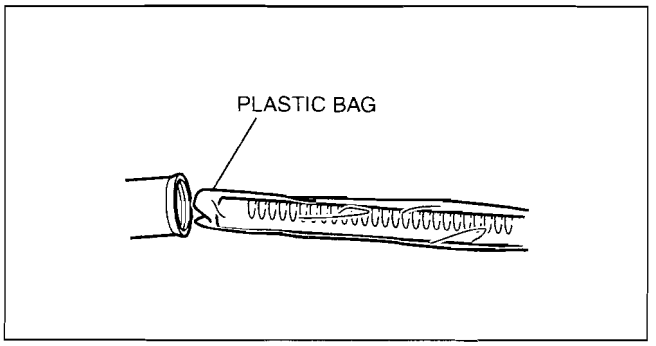
1. Apply ATF to the lip of a new oil seal.
2. Install the **SST** (49 N032 319A) to the gear housing with the raised part facing up as shown in the figure.
3. Set the stopper into the gear housing to hold the **SSTs** as shown in the figure.
4. Install the oil seal using the **SSTs** (49 F032 303, 49 F032 304) and a press.



am3uuw0000093

Steering Rack Assembly Note

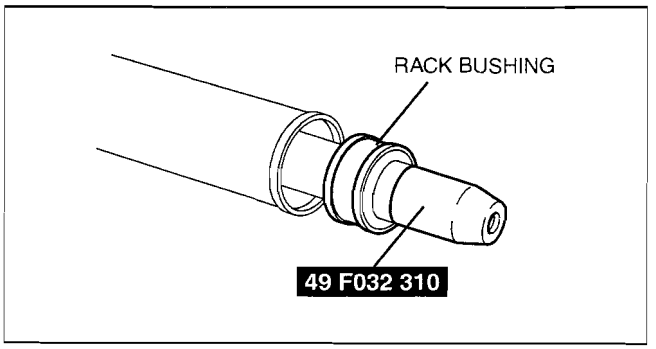
1. Apply multipurpose grease to the rack teeth.
2. Install a plastic bag to the rack teeth and insert the steering rack in the gear housing.



am3uuw0000093

Rack Bushing Assembly Note

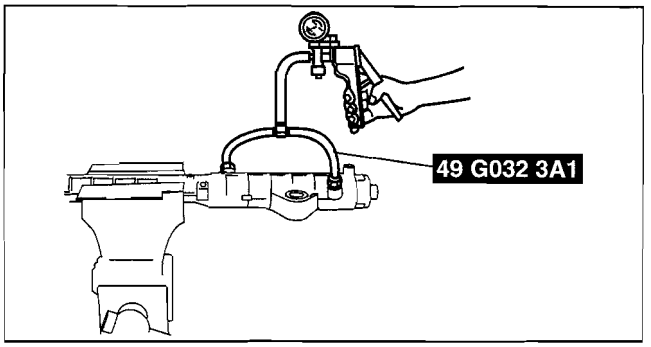
1. After installing the **SST** to the steering rack end, assemble the rack bushing to the rack housing.



am3uuw0000093

Stopper Assembly Note

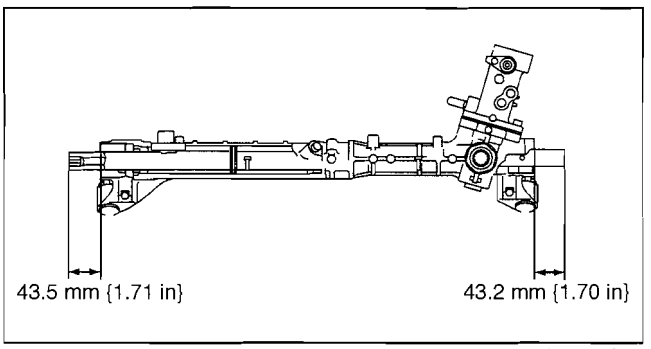
1. Assemble the stopper.
2. Inspect airtightness.
   (1) Connect the **SST** to the power cylinder section of the gear housing.
   (2) Apply **53.3 kPa {400 mmHg, 15.8 inHg}** vacuum with a vacuum pump and verify that it is held for **30 s**.
   - If the vacuum is not held, replace the oil seal.



am3uuw0000093

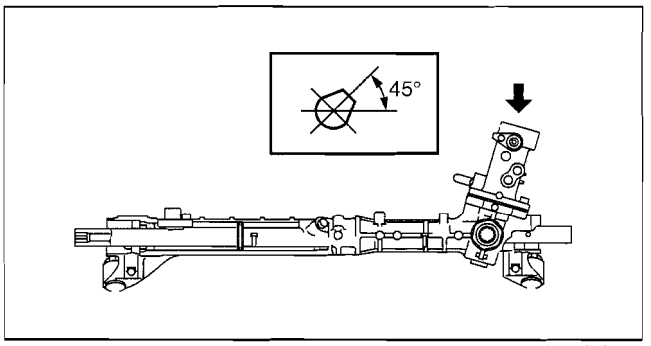
Pinion Shaft and Valve Housing Component Assembly Note

1. Set the rack in the center with the measurement between rack housing end and rack end as shown in the figure.



am3uuw0000093

2. When the pinion shaft position is as shown in the figure with the rack in the center, insert the pinion shaft and valve housing component.



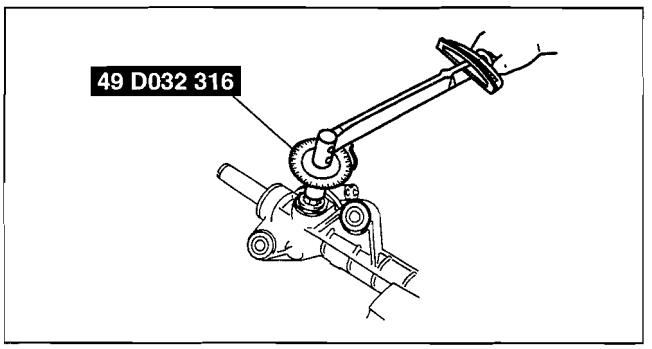
am3uuw0000093

Housing Cover Assembly Note

1. Apply silicone sealant to the threads of the housing cover.
2. Assemble the housing cover.

Adjusting Cover Assembly Note

1. Apply sealant to the threads of the adjusting cover.
2. Using the **SST**, tighten the adjusting cover with a tightening torque of **20.0 N·m {2.0 kgf·m, 14.8 ft·lbf}**.
3. Using the **SST**, loosen the adjusting cover to **25—30°**.

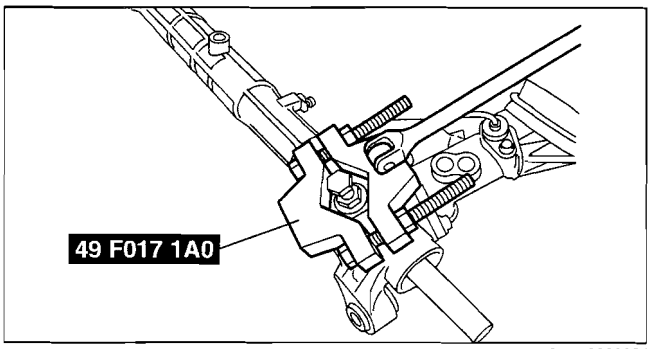


am3uuw0000093

Locknut (on Adjusting Cover) Assembly Note

Caution
- **Be sure that the adjusting cover will not turn together with the locknut.**

1. Fix the adjusting cover and tighten the locknut.

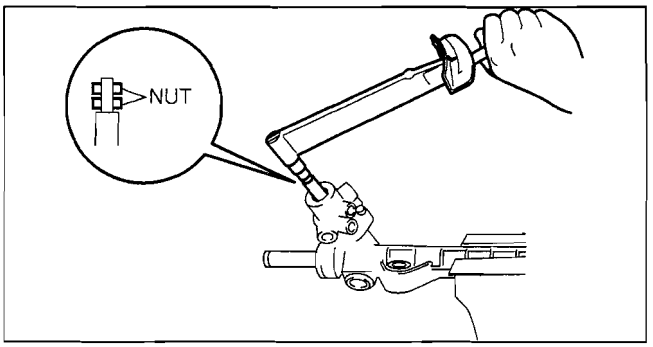


am3uuw0000094

2. Measure the pinion torque using the torque wrench.

   Pinion shaft rotation torque
   Center of rack ± 90°: 0.88—1.48 N·m {8.98—15.0 kgf·cm, 7.79—13.0 in·lbf}

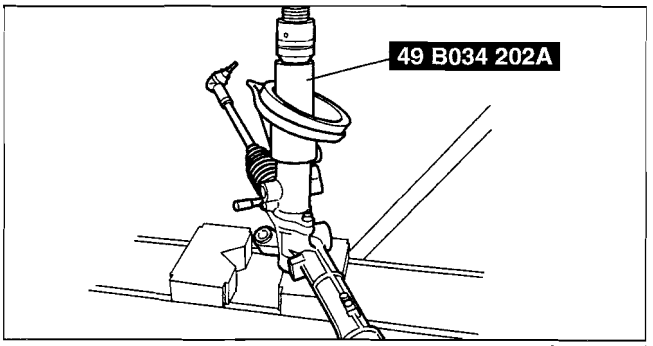
3. If not as specified, remove the locknut and adjust the adjust cover.



am3uuw0000094

Boot Assembly Note
1. Apply silicone grease to the rubber lip groove.
2. Assemble the boot.

Floor Seal Assembly Note
1. Assemble a new floor seal using the **SST** and a press.

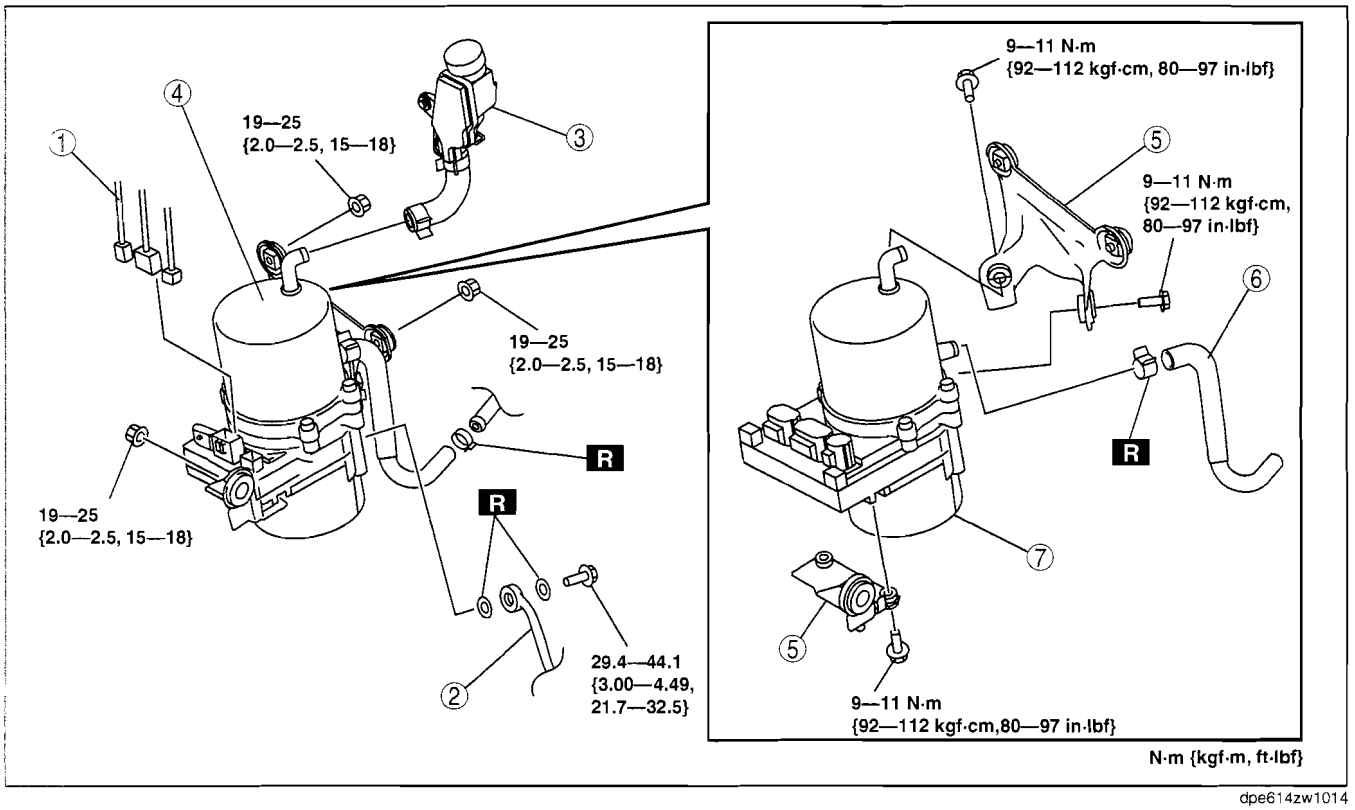


am3uuw0000094

ELECTRIC POWER STEERING OIL PUMP REMOVAL/INSTALLATION[LF, L3]

id0614008032b0

1. Remove the under cover, splash shield and mudguard.
2. Remove the front bumper. (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove the washer tank. (See 09-19-7 WASHER TANK REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. After installation, perform the Electric Power Steering OIL PUMP (EHPAS) control module configuration procedure.



dpe614zw1014

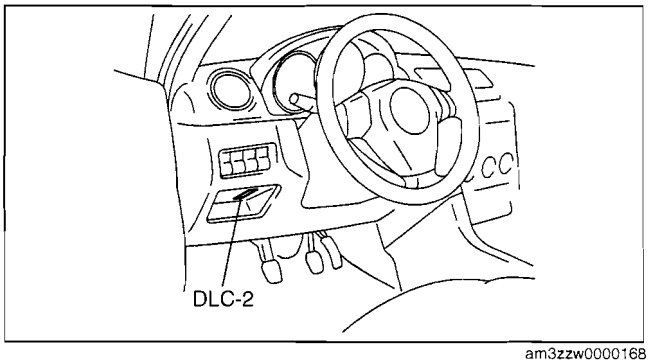
1	Connector
2	Pressure pipe
3	Power steering fluid reserve tank
4	Electric power steering oil pump and bracket component

5	Bracket
6	Return hose
7	Electric power steering oil pump

ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE CONFIGURATION[LF, L3]

id0614008024b0

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select the "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select the "Programming".
     2. Select the "Module Programming".
3. Then, select the "Programmable Module installation" and "EPS" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
   - If a DTC is present, perform the applicable DTC inspection. (See 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)



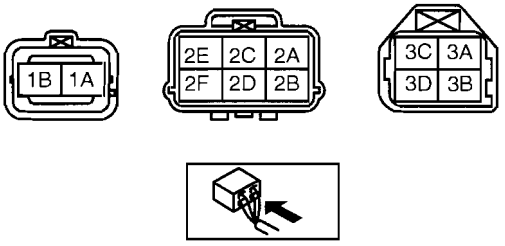
am3zzw0000168

ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) CONTROL MODULE INSPECTION[LF, L3]

id0614008025b0

Terminal Voltage Table (Reference)

EHPAS CONTROL MODULE HARNESS-SIDE CONNECTOR



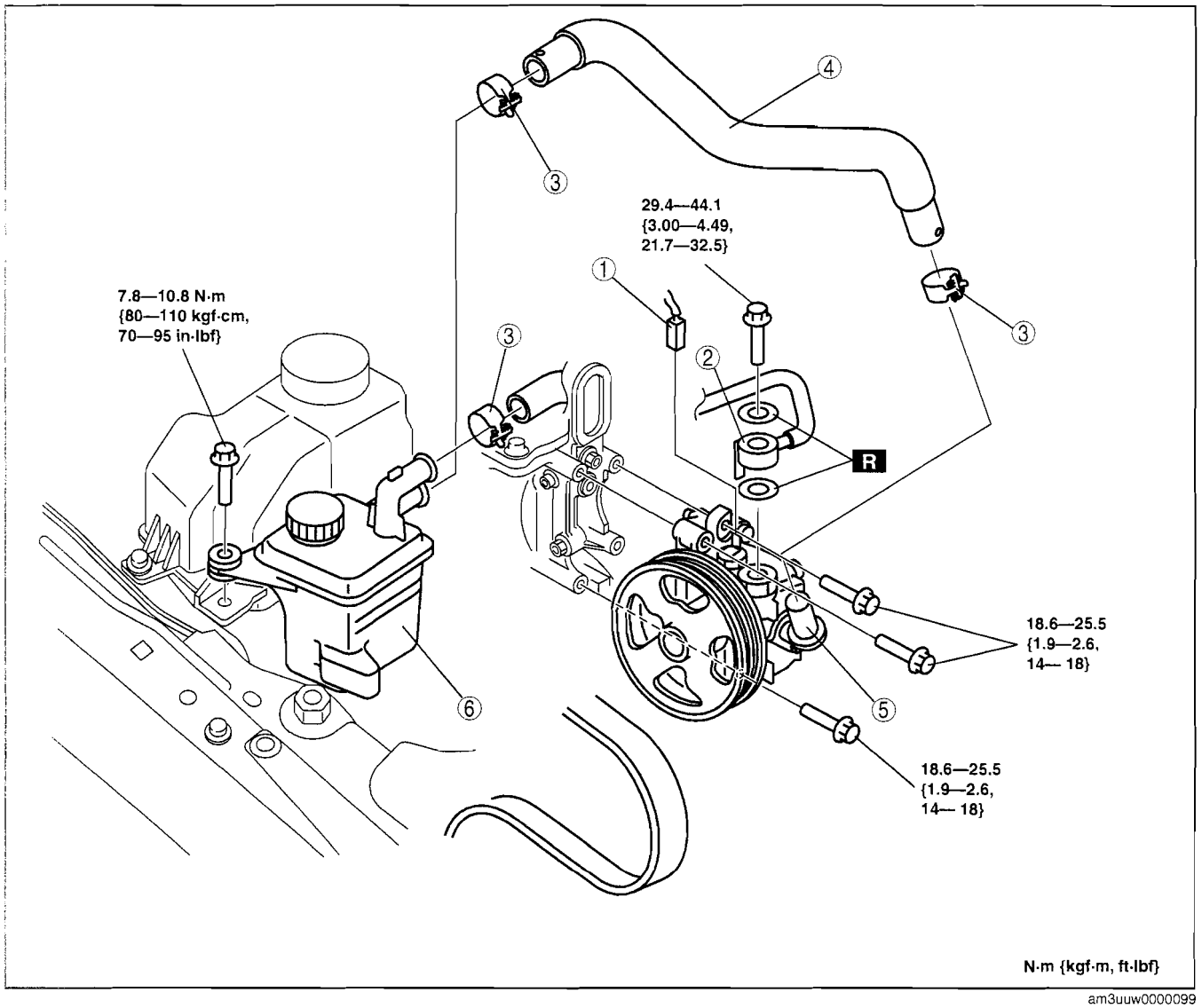
dpe614zw1015

Terminal	Signal name	Connected to	Measured item	Measured terminal (measured condition)	Standard	Inspection item(s)
1A	Ground	Ground point	Voltage	Under any condition	1 V or less	• Wiring harness (1A—ground point)
1B	Battery power supply	Battery	Voltage	Under any condition	B+	• Wiring harness (1B—battery) • Fuse (P/ST 80 A)
2A	—	—	—	—	—	—
2B	CAN_L	—	Inspect under DTC inspection.			—
2C	—	—	—	—	—	—
2D	CAN_H	—	Inspect under DTC inspection.			—
2E	—	—	—	—	—	—
2F	Ignition power supply	Ignition switch	Voltage	Ignition switch is ON	B+	• Wiring harness (2F—ignition switch—battery) • Fuse (IGNITION 20A, P/ST IG 15A)
				Ignition switch is OFF	1 V or less	
3A	Steering angle sensor ground	Steering angle sensor	Continuity	Continuity	Continuity detected	• Wiring harness (3A—steering angle sensor D)
3B	Steering angle sensor (signal 1)	Steering angle sensor	Continuity	Continuity	Continuity detected	• Wiring harness (3B—steering angle sensor B)
3C	—	—	—	—	—	—
3D	Steering angle sensor (signal 2)	Steering angle sensor	Continuity	Continuity	Continuity detected	• Wiring harness (3D—steering angle sensor C)

POWER STEERING OIL PUMP REMOVAL/INSTALLATION[L3 WITH TC]

id0614008007b1

1. Remove the drive belt. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



am3uuw0000099

1	Pressure switch connector
2	Pressure pipe
3	Hose band

4	Suction hose
5	Power steering oil pump
6	Power steering reserve tank

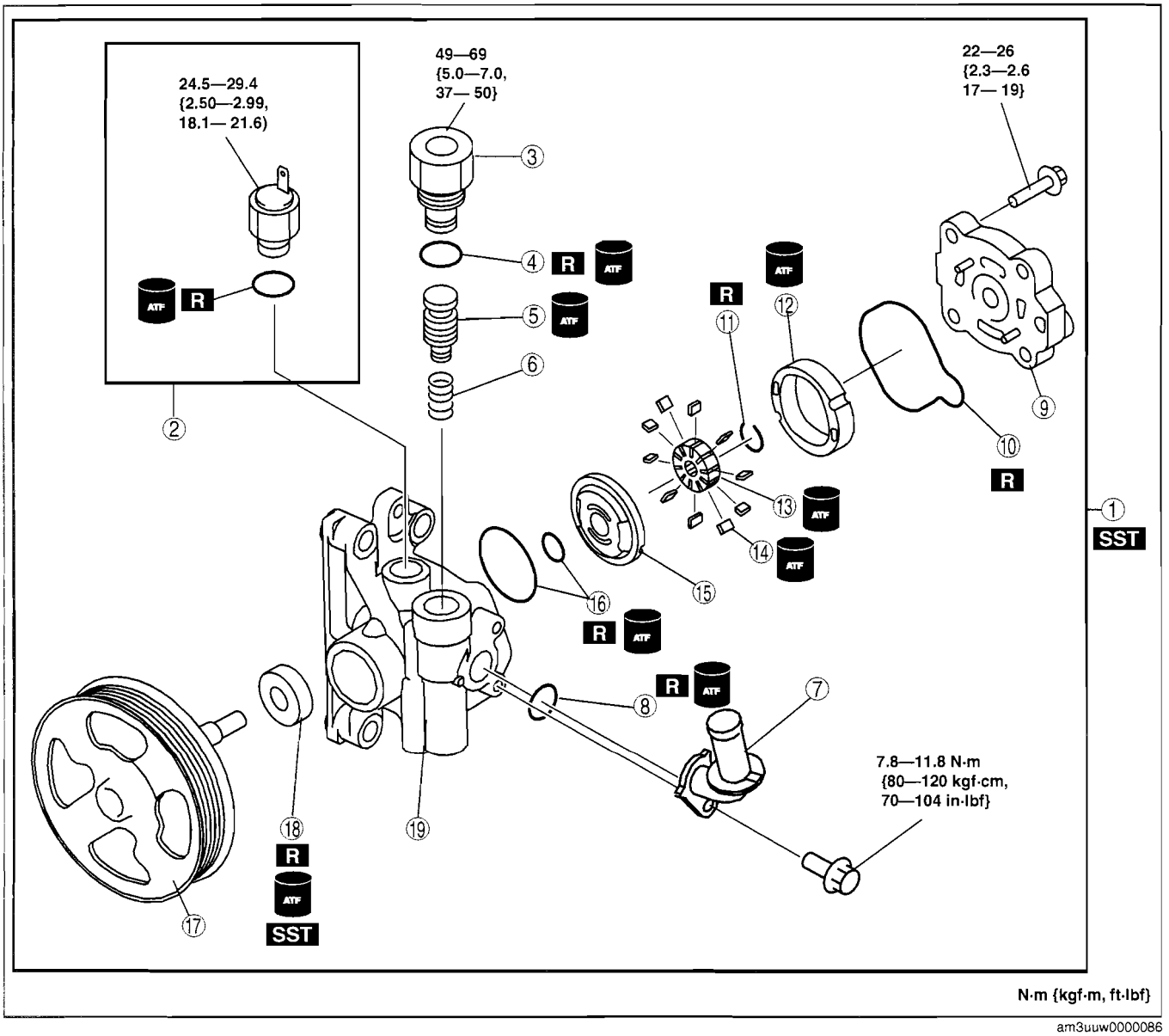
POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id0614008008b1

Note

- The following procedure is for replacement of the O-ring and oil seal only. Replace the pump component if other repairs are necessary.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000086

1	Power steering oil pump component (See 06-14-25 Power Steering Oil Pump Component Disassembly Note.)
2	Pressure switch component
3	Connector
4	O-rings
5	Control valve
6	Spring
7	Suction pipe
8	O-ring
9	Rear pump body (See 06-14-26 Rear Pump Body Assembly Note.)

10	O-ring
11	Clip
12	Cam ring (See 06-14-26 Cam Ring Assembly Note.)
13	Rotor (See 06-14-26 Rotor Assembly Note.)
14	Vane
15	Side plate (See 06-14-26 Side Plate Assembly Note.)
16	O-rings
17	Shaft component (See 06-14-25 Shaft Assembly Disassembly Note.)

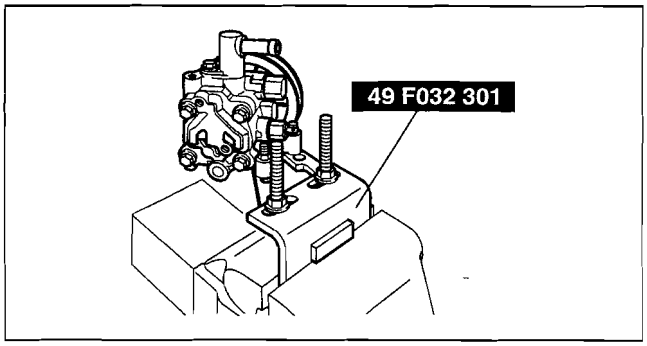
18	Oil seal (See 06-14-25 Oil seal Disassembly Note.) (See 06-14-25 Oil Seal Assembly Note.)
19	Front pump body

Power Steering Oil Pump Component Disassembly Note

1. Secure the power pressure oil pump using the **SST**.

Caution

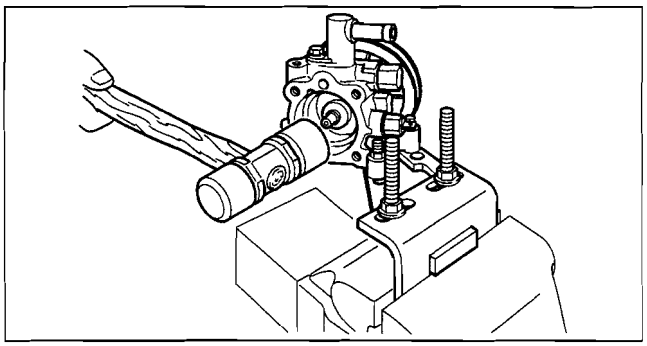
- **Use the SST to prevent damage to the pump when securing it in a vise.**



am8rrw00000898

Shaft Assembly Disassembly Note

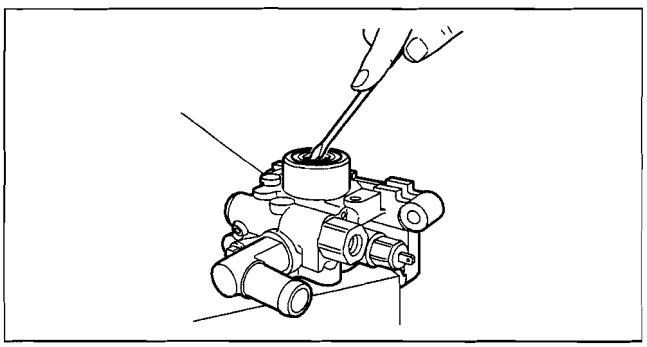
1. Using a plastic hammer, tap out the shaft component from the front pump body.



am8rrw00000899

Oil seal Disassembly Note

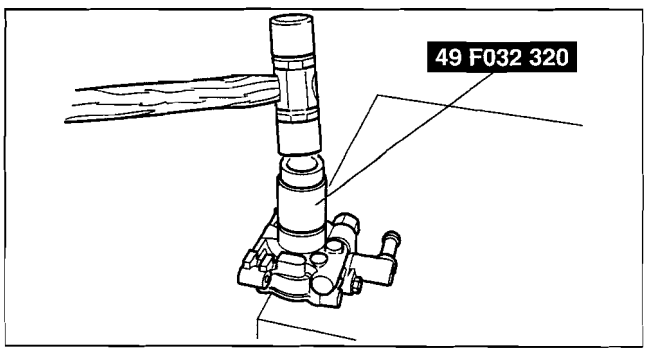
1. Remove the oil seal from the front pump body using a flathead screwdriver.



am8rrw00000900

Oil Seal Assembly Note

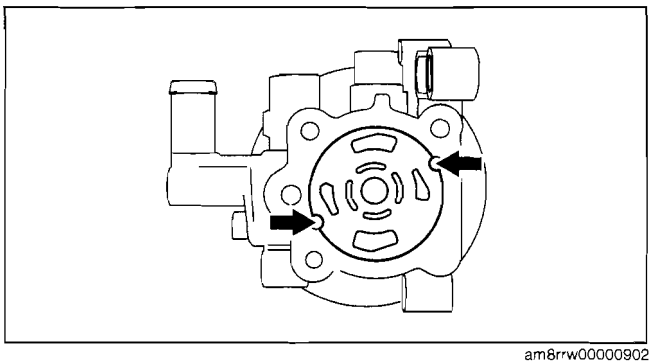
1. Install the oil seal in the front pump body using the **SST** and plastic hammer.



am3uuw0000012

Side Plate Assembly Note

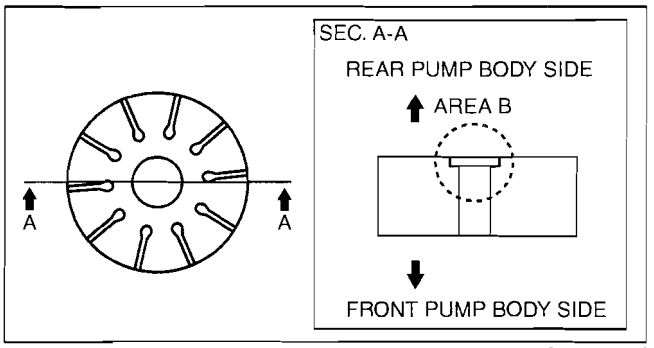
1. Install the side plate in the position shown in the figure.



am8rrw00000902

Rotor Assembly Note

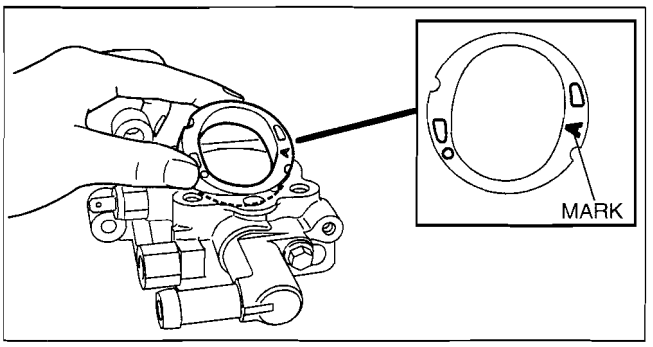
1. Install to the front pump body so that area B of the groove is on the rear pump body side as shown in the figure.



am8rrw00000903

Cam Ring Assembly Note

1. Install the cam ring in the front pump body with the mark facing upward.



am8rrw00000904

Rear Pump Body Assembly Note

1. After installing the rear body, manually turn the shaft to verify that it rotates smoothly.

STEERING ANGLE SENSOR REMOVAL/INSTALLATION

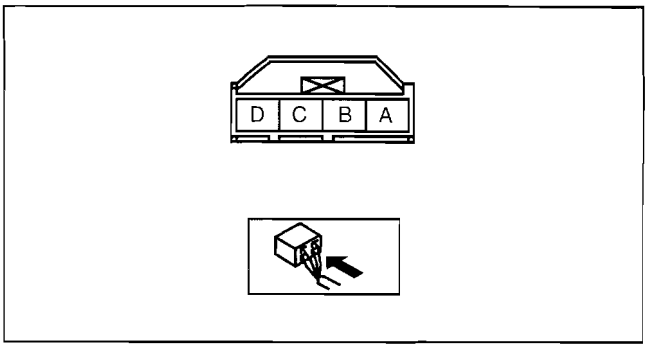
id061400802200

1. When removing or installing the steering angle sensor, refer to the clock spring removal/installation procedure. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

STEERING ANGLE SENSOR INSPECTION

id061400802100

1. Remove the column cover.
2. Turn the ignition switch to the ON position and measure the voltage between steering angle sensor terminal A and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal A and ignition switch. Repair or replace if necessary. (without DSC)
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal A and DSC HU/CM terminal AB. Repair or replace if necessary. (with DSC)



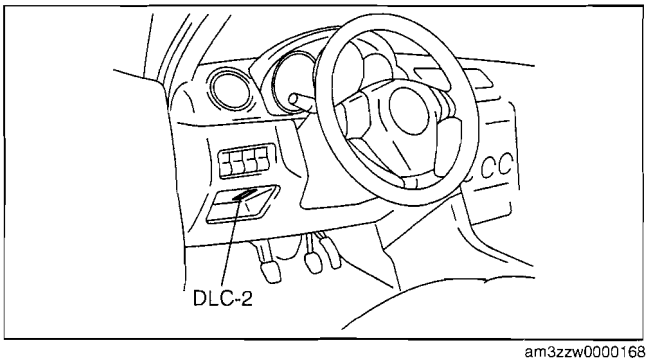
am3zzw0000168

Standard voltage
B+

3. Measure the voltage between steering angle sensor terminal D and ground.
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal D and EHPAS control module terminal 3A. Repair or replace if necessary. (without DSC)
   - If there is any malfunction, inspect the wiring harness between steering angle sensor terminal D and DSC HU/CM terminal AH. Repair or replace if necessary. (with DSC)

Standard voltage
0 V

4. Turn the ignition switch off.
5. Connect the M-MDS to the DLC-2.
6. Select the STEER_RATE PID. (see 06-02-3 ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS) ON-BOARD DIAGNOSIS[ELECTRO HYDRAULIC POWER ASSIST STEERING (EHPAS)].)
7. Verify the STEER_RATE changes when the steering wheel is turned to the left and right.
   - If there is any malfunction, replace the steering angle sensor. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)



am3zzw0000168

Standard
When the steering wheel is turned to the left:
STEER_RATE changes positively.
When the steering wheel is turned to the right:
STEER_RATE changes negatively.

06-50 TECHNICAL DATA

STEERING TECHNICAL DATA

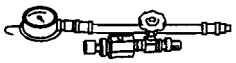
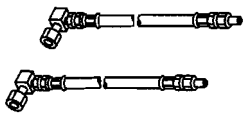
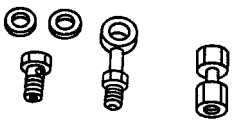
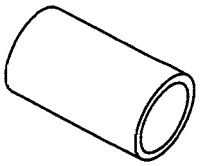
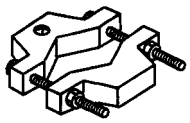
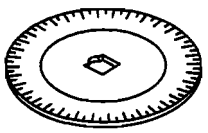
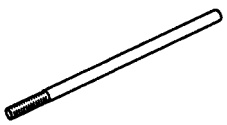
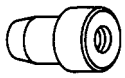
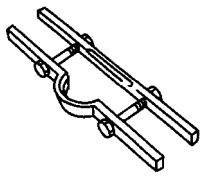
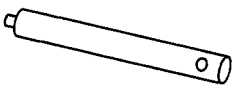
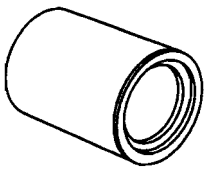
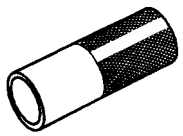
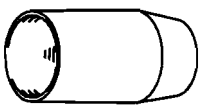
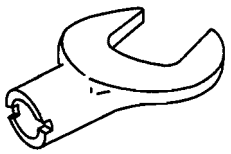
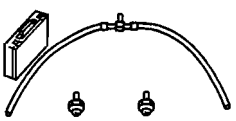
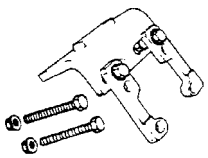
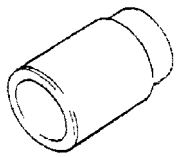
id065000800200

Item	Specification
Power steering fluid type	ATF M-III or equivalent (e.g. Dexron ® II)
Power steering fluid capacity (approximate quantity)	LF, L3: 0.8 L {0.9 US qt, 0.7 Imp qt} L3 WITH TC: 1.10 L {1.16 US qt, 0.96 Imp qt}
Oil pump fluid pressure (L3 WITH TC) (oil temperature 50—60 °C {122—140 °F})	9.7—10.2 MPa {99.0—104.0 kgf/cm^2, 1,407—1,479 psi}
Gear housing fluid pressure (L3 WITH TC) (oil temperature 50—60 °C {122—140 °F})	9.7—10.2 MPa {99.0—104.0 kgf/cm^2, 1,407—1,479 psi}
Steering wheel play	0—30 mm {0—1.18 in} (When hydraulic operating)
Steering wheel force (reference value)	7.8 N·m {80 kgf·cm, 69 in·lbf} or less
Steering shaft length	315—320 mm {12.41—12.59 in}
Steering rack runout	Large diameter portion: 0.15 mm {0.006 in} max. Small diameter portion: 0.20 mm {0.008 in} max.
Tie-rod end rotational torque	0.5—3.0 N·m {6—30 kgf·cm, 5—26 in·lbf}
Tie rod swing torque	0.4—4.0 N·m {5—40 kgf·cm, 4—35 in·lbf} [Pull scale reading 0.6—29.3 N {0.06—2.98 kgf, 0.14—6.58 lbf}]
Pinion shaft rotation torque	Center of rack ± 90°: 0.88—1.48 N·m {8.98—15.0 kgf·cm, 7.79—13.0 in·lbf}

06-60 SERVICE TOOLS

STEERING SST

id066000800100

49 1232 670B Power steering gauge set 	49 H002 671 Adapter 	49 G032 3A4A Power steering gauge adapter set 
49 B034 202A Support block 	49 F017 1A0 Universal wrench 	49 D032 316 Protractor 
49 F032 303 Handle 	49 B032 323 Remover body rod seal 	49 N032 319A Support plate 
49 G033 102 Handle 	49 T028 301 Dust boot installer 	49 F015 002 Water seal installer 
49 F032 304 Body 	49 F032 310 Protector 	49 H032 301 Wrench 
49 G032 3A1 Joint hose set 	49 F032 301 Power steering pump hanger 	49 F032 320 Installer A (Part of 49 F032 3A2) 

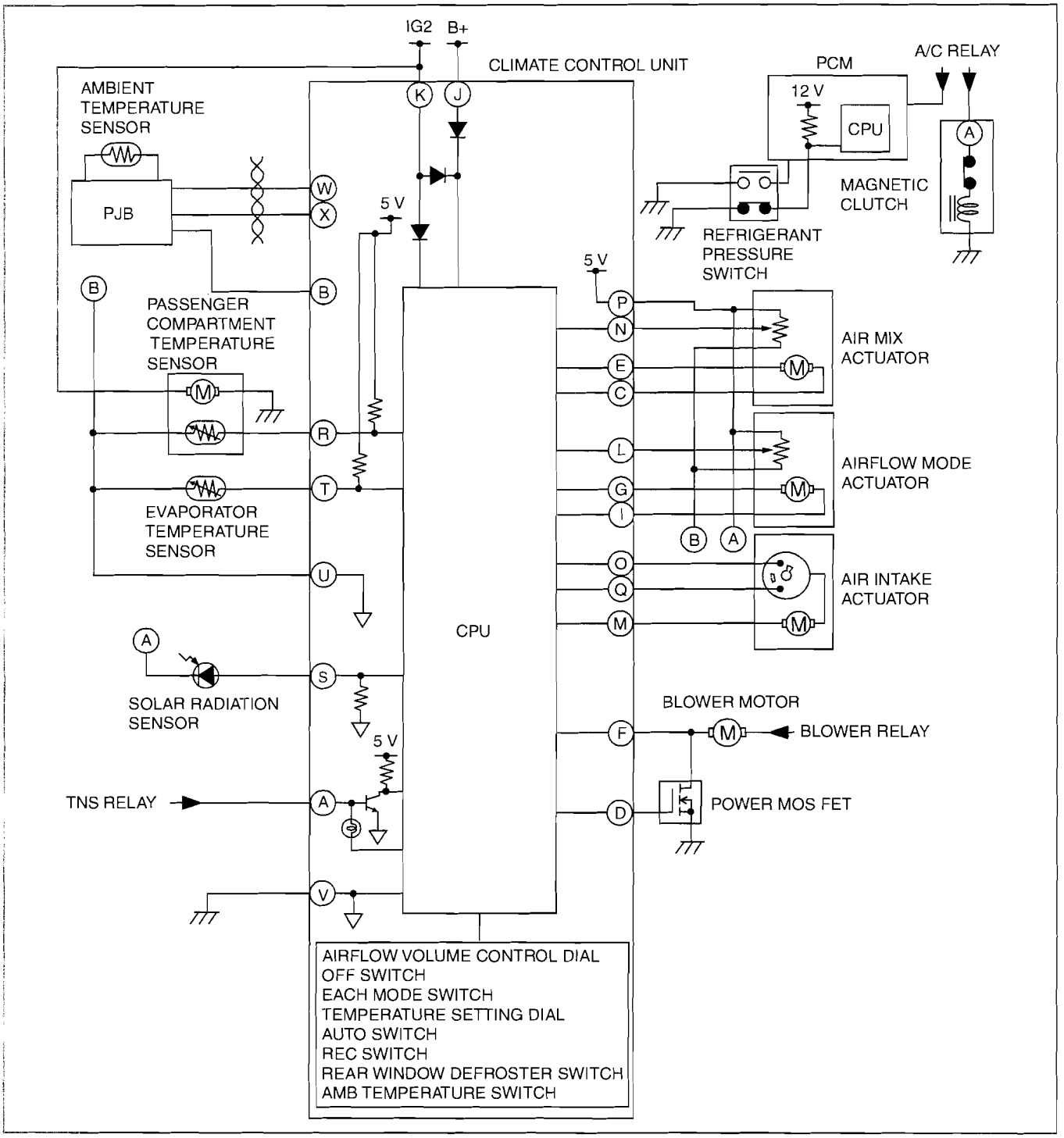
HEATER, VENTILATION & AIR CONDITIONING (HVAC)

07 SECTION

07-02 ON-BOARD DIAGNOSTIC

HVAC SYSTEM WIRING DIAGRAM

id070200800100



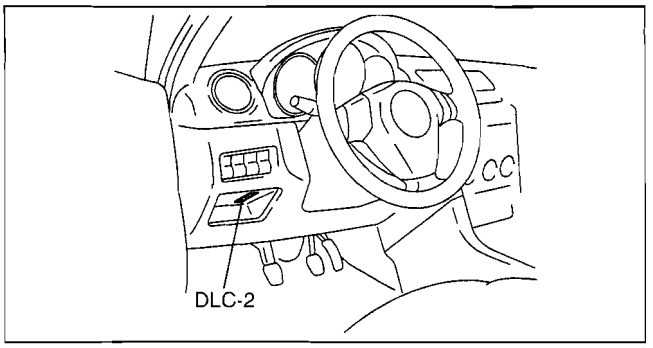
am3uuw0000068

DTC DISPLAY

id070200801500

1. Connect the M-MDS to the DLC-2 connector.
2. Shine a **fluorescent light directly onto the solar radiation sensor**.

Note
- If influorescent light is not shone on the solar radiation sensor, the climate control unit determines a malfunction and indicates DTC "B1260, B1261".



am3uuw0000059

3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select the "Self Test".
     - — Select the "Modules".
     - — Select the "EATC".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select the "Optional" tab.
     - — Select the "EATC".
     - — Select the "Self Test".
4. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the climate control unit. (See 07-02-4 CLEARING DTC.)

07-02

DTC TABLE

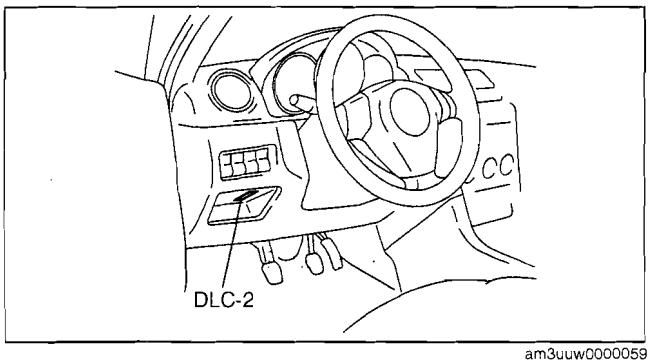
id070200801700

DTC	Malfunction location	Detected condition	Memory function	Page
B1251	Passenger compartment temperature sensor	Passenger compartment temperature sensor circuit open	X	(See 07-02-5 DTC B1251, B1253.) (See 07-02-6 DTC B1251, B1253, B1274, B1275, B1282, B1283, B1947, B2014 (MULTIPLE DTCS INDICATED).)
B1253		Passenger compartment temperature sensor circuit short (body ground)	X	
B1260	Solar radiation sensor	Solar radiation sensor circuit short (power supply)	X	(See 07-02-7 DTC B1260, B1261.) (See 07-02-8 DTC B1260, B1261, B1274, B1275, B1282, B1283 (MULTIPLE DTCS INDICATED).)
B1261		Solar radiation sensor circuit short (body ground)	—	
B1274	Airflow mode actuator (potentiometer)	Airflow mode actuator (potentiometer) circuit short (power supply)	X	(See 07-02-9 DTC B1274, B1275.) (See 07-02-6 DTC B1251, B1253, B1274, B1275, B1282, B1283, B1947, B2014 (MULTIPLE DTCS INDICATED).) (See 07-02-8 DTC B1260, B1261, B1274, B1275, B1282, B1283 (MULTIPLE DTCS INDICATED).)
B1275		Airflow mode actuator (potentiometer) circuit short (body ground)	X	
B1282	Air mix actuator (potentiometer)	Air mix actuator (potentiometer) circuit short (power supply)	X	(See 07-02-10 DTC B1282, B1283.) (See 07-02-6 DTC B1251, B1253, B1274, B1275, B1282, B1283, B1947, B2014 (MULTIPLE DTCS INDICATED).) (See 07-02-8 DTC B1260, B1261, B1274, B1275, B1282, B1283 (MULTIPLE DTCS INDICATED).)
B1283		Air mix actuator (potentiometer) circuit short (body ground)	X	
B1947	Evaporator temperature sensor	Evaporator temperature sensor circuit short (body ground)	X	(See 07-02-11 DTC B1947, B2014.) (See 07-02-6 DTC B1251, B1253, B1274, B1275, B1282, B1283, B1947, B2014 (MULTIPLE DTCS INDICATED).)
B2014		Evaporator temperature sensor circuit open	X	
B2832	Airflow mode actuator (motor lock)	Airflow mode actuator motor lock	X	(See 07-02-12 DTC B2832.)
B2834	Air mix actuator (motor lock)	Air mix actuator motor lock	X	(See 07-02-13 DTC B2834.)

DTC	Malfunction location	Detected condition	Memory function	Page
U0140	CAN communication system	Reception error in signal from PJB	X	—
U0155		Reception error in signal from ICM (HEC)	X	—
U0156		Reception error in signal from MC (DISP)	X	—
U0516		BUS OFF error	X	—

CLEARING DTC

id070200801600



am3uuw0000059

1. Connect the M-MDS to the DLC-2 connector.
2. Shine a **fluorescent light directly onto the solar radiation sensor**.

   Note
   - If influorescent light is not shone on the solar radiation sensor, the climate control unit determines a malfunction and indicates DTC "B1260, B1261".

3. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select the "Self Test".
     - — Select the "Modules".
     - — Select the "EATC".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select the "Optional" tab.
     - — Select the "EATC".
     - — Select the "Self Test".
4. Verify the DTC according to the directions on the screen.
5. Press the clear button on the DTC screen to clear the DTC.
6. Verify that no DTCs are displayed.

DTC B1251, B1253

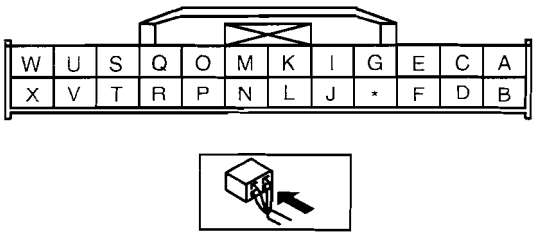
id070200800300

DTC B1251, B1253	Passenger compartment temperature sensor system
POSSIBLE CAUSE	• Passenger compartment temperature sensor malfunction • Open or short circuit in wiring harness between climate control unit and passenger compartment temperature sensor

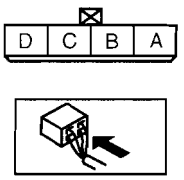
Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect the passenger compartment temperature sensor. (See 07-40-25 PASSENGER COMPARTMENT TEMPERATURE SENSOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the passenger compartment temperature sensor. (See 07-40-25 PASSENGER COMPARTMENT TEMPERATURE SENSOR REMOVAL/ INSTALLATION.)
2	• Disconnect the climate control unit connector and the passenger compartment temperature sensor connector. • Is there an open circuit in the wiring harness between the following terminals of the climate control unit and the passenger compartment temperature sensor? — R—D — U—B	Yes	Repair the wiring harness.
		No	Go to the next step.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal R and passenger compartment temperature sensor terminal D?	Yes	Repair the wiring harness.
		No	Connect the climate control unit connector, then go to the next step.
4	• Turn the ignition switch to the ON position. • Inspect the voltage at the following climate control unit terminal (wiring harness-side). — Terminal R (passenger compartment temperature sensor input signal) • Is the voltage normal? (**Approx. 5 V**)	Yes	The system is normal at present. (Clear the past malfunction from the memory.)
		No	Inspect the connection of the climate control unit connector. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)

CLIMATE CONTROL UNIT CONNECTOR



PASSENGER COMPARTMENT TEMPERATURE SENSOR



DTC B1251, B1253, B1274, B1275, B1282, B1283, B1947, B2014 (MULTIPLE DTCS INDICATED)

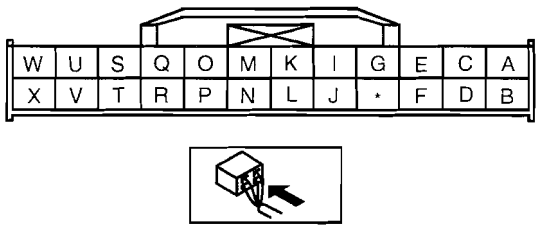
id070200805300

DTC B1251, B1253, B1947, B2014, B1282, B1283, B1274, B1275	**Climate control unit (+5 V power supply or sensor ground) system**
POSSIBLE CAUSE	• Open circuit in wiring harnesses between climate control unit and each temperature sensor, air mix actuator, or airflow mode actuator

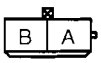
Diagnostic Procedure

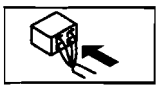
STEP	INSPECTION		ACTION
1	• Disconnect the climate control unit connector and the evaporator temperature sensor connector. • Is there an open circuit in the wiring harness between climate control unit terminal U and evaporator temperature sensor terminal A?	Yes	Repair the wiring harness.
		No	The system is normal at present. (Clear the past malfunction from the memory.)

CLIMATE CONTROL UNIT CONNECTOR



EVAPORATOR TEMPERATURE SENSOR CONNECTOR





DTC B1260, B1261

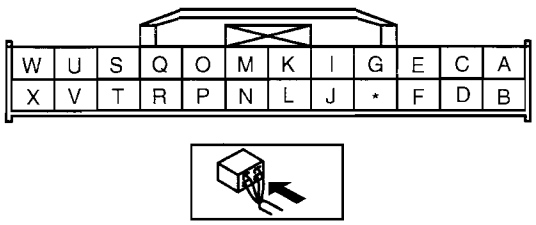
id070200800500

DTC B1260, B1261	Solar radiation sensor system
POSSIBLE CAUSE	• Solar radiation sensor malfunction • Open or short circuit in wiring harness between climate control unit and solar radiation sensor

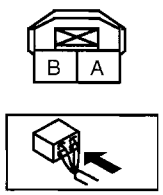
Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect the solar radiation sensor. (See 07-40-23 SOLAR RADIATION SENSOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the solar radiation sensor. (See 07-40-23 SOLAR RADIATION SENSOR REMOVAL/ INSTALLATION.)
2	• Disconnect the climate control unit connector and the solar radiation sensor connector. • Is there continuity between the following terminals of the climate control unit and the solar radiation sensor? — S—B — P—A	Yes	Go to the next step.
		No	Repair the wiring harness.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal S and solar radiation sensor terminal B?	Yes	Repair the wiring harness.
		No	Inspect the connection of the climate control unit connector. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)

CLIMATE CONTROL UNIT CONNECTOR



SOLAR RADIATION SENSOR CONNECTOR



07-02

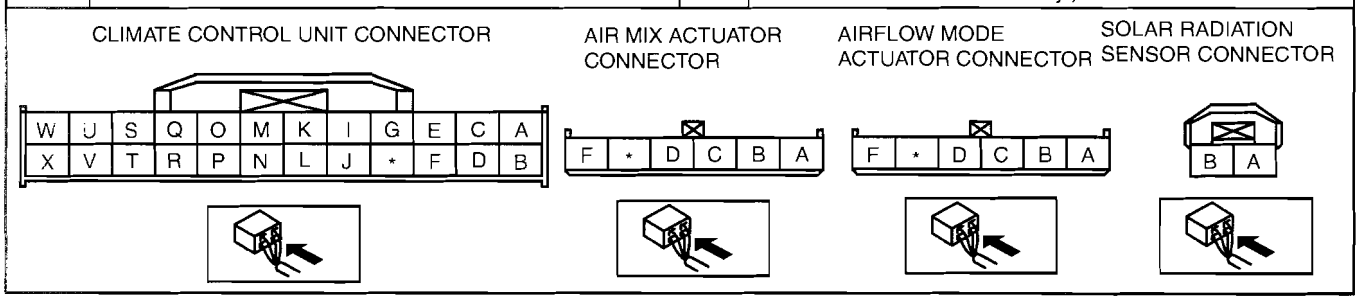
DTC B1260, B1261, B1274, B1275, B1282, B1283 (MULTIPLE DTCS INDICATED)

id070200800700

DTC B1260, B1261, B1282, B1283, B1274, B1275	**Climate control unit (+5 V power supply) system**
POSSIBLE CAUSE	• Open or short circuit in wiring harnesses between climate control unit and solar radiation sensor, air mix actuator, or airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect the climate control unit connector and the airflow mode actuator connector. • Is there an open circuit in the wiring harness between climate control unit terminal P and airflow mode actuator terminal A?	Yes	Repair the wiring harness.
		No	Go to the next step.
2	• Is there a short circuit to ground in the wiring harness between climate control unit terminal P and airflow mode actuator terminal A?	Yes	Repair the wiring harness.
		No	Go to the next step.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal P and air mix actuator terminal A?	Yes	Repair the wiring harness.
		No	Go to the next step.
4	• Is there a short circuit to ground in the wiring harness between climate control unit terminal P and solar radiation sensor terminal A?	Yes	Repair the wiring harness.
		No	The system is normal at present. (Clear the past malfunction from the memory.)



DTC B1274, B1275

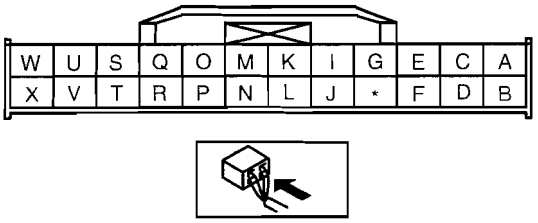
id070200800800

DTC B1274, B1275	Airflow mode actuator (potentiometer) system
POSSIBLE CAUSE	• Airflow mode actuator malfunction • Open circuit in wiring harness between climate control unit and airflow mode actuator • Short circuit in wiring harness between climate control unit (terminal L) and airflow mode actuator (terminal C)

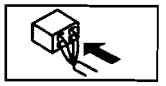
Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Inspect the airflow mode actuator. (See 07-40-9 AIRFLOW MODE ACTUATOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the airflow mode actuator. (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/ INSTALLATION.)
2	• Disconnect the climate control unit connector and the airflow mode actuator connector. • Is there an open circuit in the wiring harness between the following terminals of the climate control unit and the airflow mode actuator? — P—A — L—C — U—B	Yes	Repair the wiring harness.
		No	Go to the next step.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal L and airflow mode actuator terminal C?	Yes	Repair the wiring harness.
		No	The system is normal at present. (Clear the past malfunction from the memory.)

CLIMATE CONTROL UNIT CONNECTOR



AIRFLOW MODE ACTUATOR CONNECTOR



07-02

DTC B1282, B1283

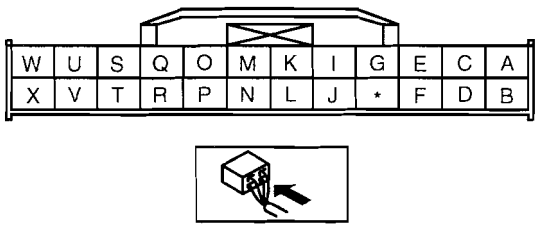
id070200800900

DTC B1282, B1283	Air mix actuator (potentiometer) system
POSSIBLE CAUSE	• Air mix actuator malfunction • Open circuit in wiring harness between climate control unit and air mix actuator • Short circuit in wiring harness between climate control unit (terminal N) and air mix actuator (terminal C)

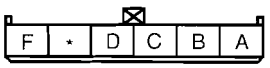
Diagnostic Procedure

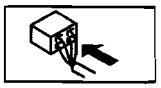
STEP	INSPECTION		ACTION
1	• Inspect the air mix actuator. (See 07-40-8 AIR MIX ACTUATOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the air mix actuator. (See 07-40-6 AIR MIX ACTUATOR REMOVAL/INSTALLATION.)
2	• Disconnect the climate control unit connector and the air mix actuator connector. • Is there an open circuit in the wiring harness between the following terminals of the climate control unit and the air mix actuator? — P—A — N—C — U—B	Yes	Repair the wiring harness.
		No	Go to the next step.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal N and air mix actuator terminal C?	Yes	Repair the wiring harness.
		No	The system is normal at present. (Clear the past malfunction from the memory.)

CLIMATE CONTROL UNIT CONNECTOR



AIR MIX ACTUATOR CONNECTOR





DTC B1947, B2014

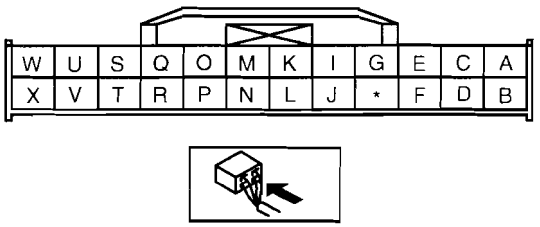
id070200801000

DTC B1947, B2014	Evaporator temperature sensor system
POSSIBLE CAUSE	• Evaporator temperature sensor malfunction • Open or short circuit in wiring harness between climate control unit and evaporator temperature sensor

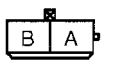
Diagnostic Procedure

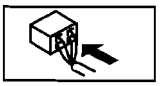
STEP	INSPECTION		ACTION
1	• Inspect the evaporator temperature sensor. (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the evaporator temperature sensor. (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION.)
2	• Disconnect the climate control unit connector and the evaporator temperature sensor connector. • Is there an open circuit in the wiring harness between the following terminals of the climate control unit and the evaporator temperature sensor? — T—B — U—A	Yes	Repair the wiring harness.
		No	Go to the next step.
3	• Is there a short circuit to ground in the wiring harness between climate control unit terminal T and evaporator temperature sensor terminal B?	Yes	Repair the wiring harness.
		No	Connect the climate control unit connector, then go to the next step.
4	• Turn the ignition switch to the ON position. • Inspect the voltage at the following climate control unit terminal (wiring harness-side). — Terminal T (evaporator temperature sensor input signal) • Is the voltage normal? (**Approx. 5 V**)	Yes	The system is normal at present. (Clear the past malfunction from the memory.)
		No	Inspect the connection of the climate control unit connector. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)

CLIMATE CONTROL UNIT CONNECTOR



EVAPORATOR TEMPERATURE SENSOR CONNECTOR





07-02

DTC B2832

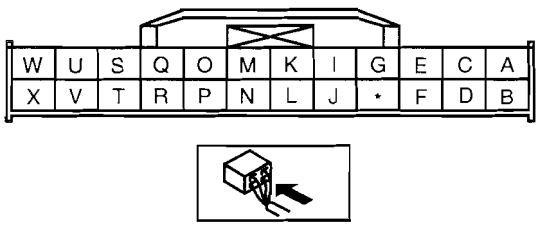
id070200801100

DTC B2832	**Airflow mode actuator (motor lock) system** Note • **DTC B2832 will be detected when the ignition switch is turned to the ON position and approx. 30 s have passed since the airflow mode actuator is operated.**
POSSIBLE CAUSE	• Airflow mode actuator malfunction • A/C unit (airflow mode link and airflow mode crank) malfunction • Open or short circuit in wiring harness between climate control unit and airflow mode actuator

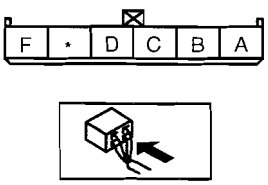
Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect the airflow mode actuator connector. • Connect battery positive voltage to airflow mode actuator terminal D (or terminal F) and terminal F (or terminal D) to ground. • Does the airflow mode actuator operate?	Yes	Connect the connector, then go to Step 3.
		No	Go to the next step.
2	• Remove the airflow mode actuator. • Operate the airflow mode main link manually. • Does the airflow mode main link operate smoothly?	Yes	Replace the airflow mode actuator. (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/ INSTALLATION.)
		No	Replace the airflow mode main link, airflow mode sub link, and the airflow mode crank.
3	• Disconnect the climate control unit connector. • Connect battery positive voltage to climate control unit terminal I (or terminal G) and terminal G (or terminal I) to ground. • Does the airflow mode actuator operate?	Yes	Inspect the connection of the climate control unit connector. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)
		No	Repair the wiring harness.

CLIMATE CONTROL UNIT CONNECTOR



AIRFLOW MODE ACTUATOR CONNECTOR



DTC B2834

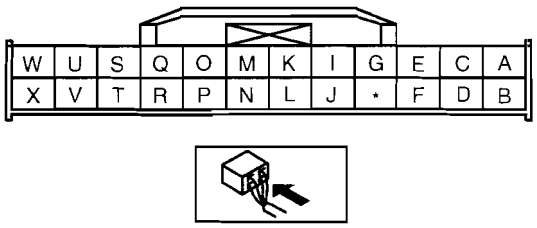
id070200801200

DTC B2834	**Air mix actuator (motor lock) system** **Note** • **DTC B2834 will be detected when the ignition switch is turned to the ON position and approx. 30 s have passed since the air mix actuator is operated.**
POSSIBLE CAUSE	• Air mix actuator malfunction • A/C unit (air mix link and air mix crank) malfunction • Open or short circuit in wiring harness between climate control unit and air mix actuator

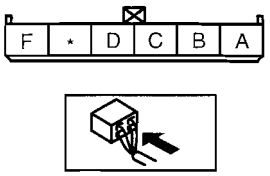
Diagnostic Procedure

STEP	INSPECTION		ACTION
1	• Disconnect the air mix actuator connector. • Connect battery positive voltage to air mix actuator terminal F (or terminal D) and terminal D (or terminal F) to ground. • Does the air mix actuator operate?	Yes	Connect the connector, then go to Step 3.
		No	Go to the next step.
2	• Remove the air mix actuator. • Operate the air mix link manually. • Does the air mix link operate smoothly?	Yes	Replace the air mix actuator. (See 07-40-6 AIR MIX ACTUATOR REMOVAL/INSTALLATION.)
		No	Replace the air mix link and the air mix crank.
3	• Disconnect the climate control unit connector. • Connect battery positive voltage to climate control unit terminal D (or terminal C) and terminal C (or terminal D) to ground. • Does the air mix actuator operate?	Yes	Inspect the connection of the climate control unit connector. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)
		No	Repair the wiring harness.

CLIMATE CONTROL UNIT CONNECTOR



AIR MIX ACTUATOR CONNECTOR



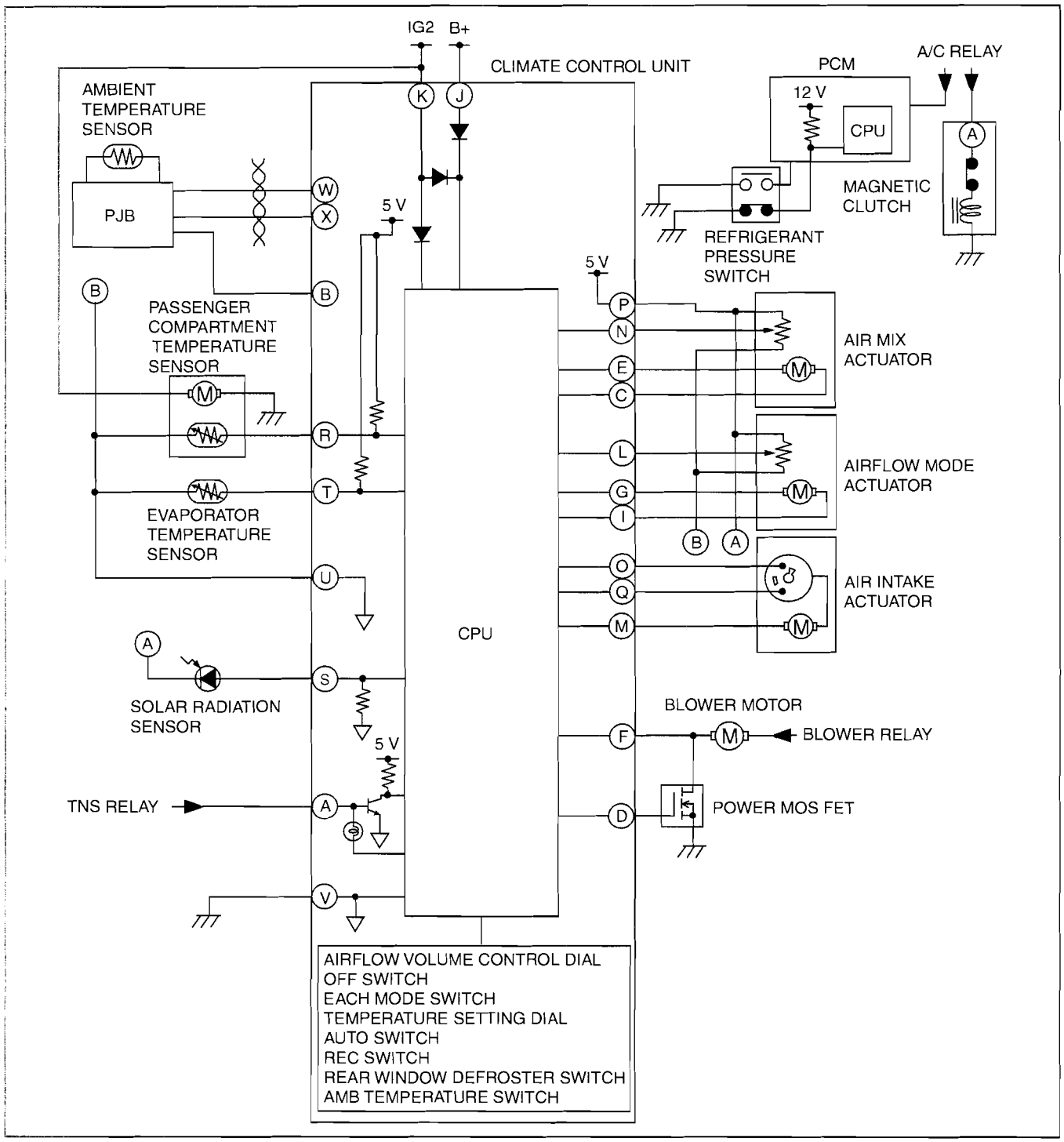
07-02

07-03 SYMPTOM TROUBLESHOOTING

HVAC SYSTEM WIRING DIAGRAM

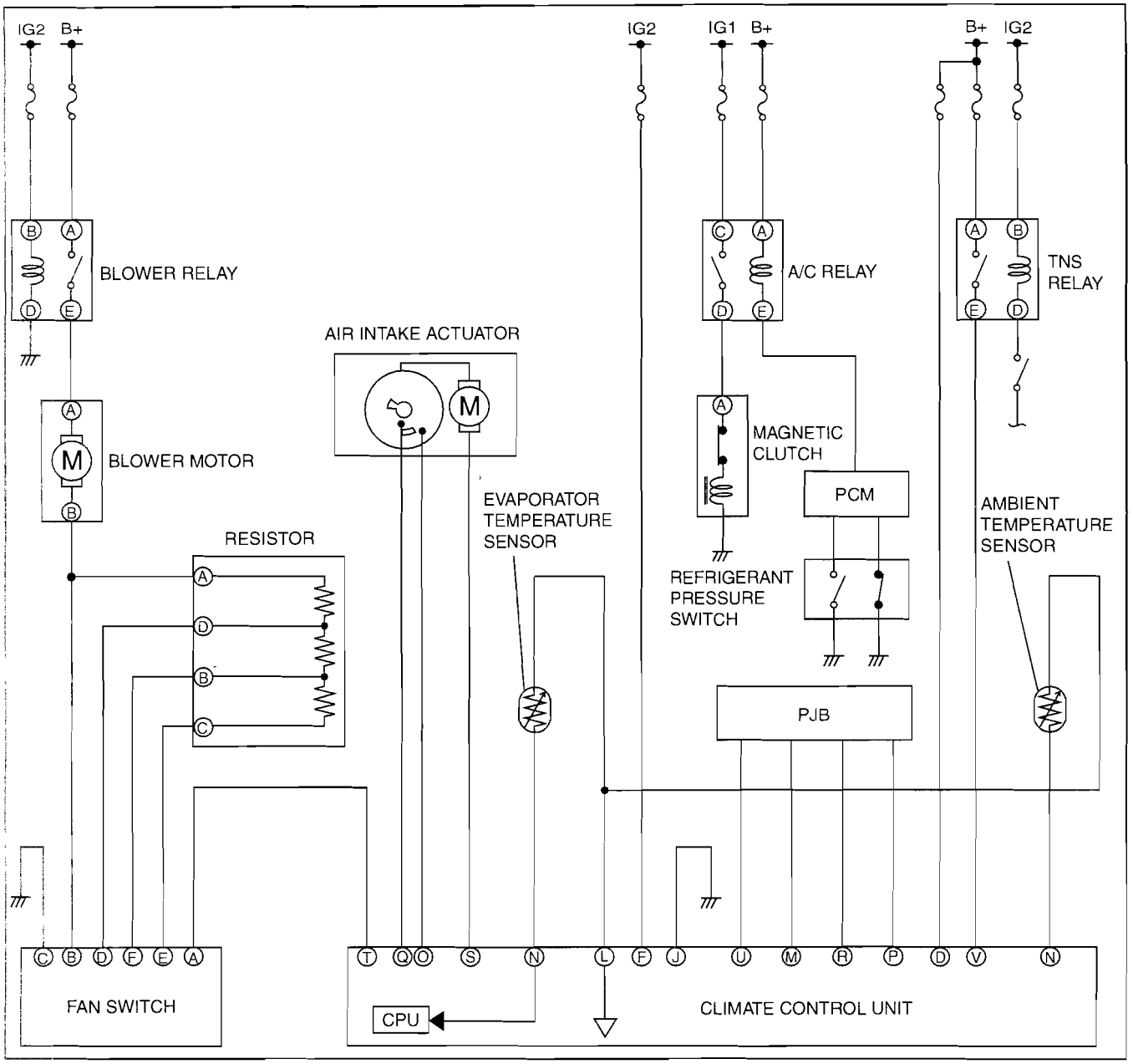
id070300800100

Full-auto Air Conditioner



am3uuw0000068

Manual Air Conditioner



am3uuw0000060

FOREWORD

id070300800200

- The areas for inspection (steps) are given according to various circuit malfunctions. Use the following chart to verify the symptoms of the trouble in order to diagnose the appropriate area.

TROUBLESHOOTING INDEX

id070300800300

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Insufficient air (or no air) blown from vents	• Problem with each vent or duct or both. • Airflow mode does not change.
2	Amount of air blown from vents does not change. (Full-auto air conditioner)	• Malfunction in blower system
3	Amount of air blown from vents does not change. (Manual air conditioner)	• Malfunction in blower system
4	Air intake mode does not change.	• Air intake mode does not change when switching REC/FRESH mode.
5	No temperature control with climate control unit	• Malfunction in A/C unit and/or climate control unit air mix system or both
6	Windshield fogged.	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
7	Air from vents not cold enough	• Magnetic clutch operates but A/C system malfunctions.
8	No cool air	• Magnetic clutch does not operate.
9	Noise while operating A/C system	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line

NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

id070300800400

1	Insufficient air (or no air) blown from vents
DESCRIPTION	• Problem with each vent or duct or both. • Airflow mode dose not change.
POSSIBLE CAUSE	• Malfunction in airflow mode actuator • Malfunction in VENT mode system • Malfunction in HEAT mode system • Malfunction in DEFROSTER mode system

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIRFLOW MODE ACTUATOR** • Inspect airflow mode actuator. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace malfunctioning part in accordance with further inspection result.
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR OTHER MODES** • Dose air blow out when in VENT mode?	Yes	Go to Step 5.
		No	Go to the next step.
3	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to the next step.
4	**VERIFY THAT DUCT IN DASHBOARD IS INSTALLED** • Is duct in dashboard properly installed?	Yes	Inspect the duct for clogging, deformation and air leakage, then go to Step 9.
		No	Install the duct securely in the proper position, then go to Step 9.
5	**INSPECT TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE** • Does air blow out when in the HEAT mode?	Yes	Go to the next step.
		No	Inspect the vent for clogging, then go to Step 9.
6	**INSPECT DEFROSTER MODE** • Does air blow out when in the DEFROSTER mode?	Yes	Operation is normal. Recheck malfunction symptoms.
		No	Go to the next step.
7	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to the next step.
8	**VERIFY THAT DEFROSTER DUCT IS INSTALLED** • Is the defroster duct properly installed?	Yes	Inspect the duct for clogging, deformity, and air leakage, then go to the next step.
		No	Install the duct securely in proper position, then go to the next step.
9	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

id070300800500

Full-auto Air Conditioner

2	Amount of air blown from vents does not change.
DESCRIPTION	• Malfunction in blower system
POSSIBLE CAUSE	• A/C unit malfunction • Blower motor malfunction • Malfunction in power MOS FET system • Climate control unit malfunction

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, inspect make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT HEATER 40 A FUSE** • Inspect the HEATER 40 A fuse. • Is it normal?	Yes	Go to the next step.
		No	Replace the fuse, then go to Step 15. If the fuse burns out immediately, go to the next step.
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C UNIT OR ELSEWHERE** • Turn the ignition switch to the ON position. • Recirculate air inside the vehicle. • Does the blower motor rotate smoothly?	Yes	Go to Step 4.
		No	Go to the next step.
3	**INSPECT A/C UNIT INTAKE VENT** • Is A/C unit intake vent clogged?	Yes	Remove obstruction, then go to Step 15.
		No	Inspect if there are any obstruction in the A/C unit passage, then go to Step 15.
4*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER RELAY SYSTEM OR POWER MOS FET SYSTEM** • Turn the ignition switch to ON position. • Measure the voltage at the following blower motor terminal. — Terminal B (blower motor operation signal) • Is voltage **approx. 12 V**?	Yes	Go to Step 8.
		No	Go to the next step.
5*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND BLOWER RELAY) OR ELSEWHERE** • Measure the voltage at the following blower relay terminals. — Terminal B (IG2 signal) — Terminal A (B+ signal) • Is the voltage **approx. 12 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the blower relay and HEATER 40 A fuse, then go to Step 15.
6*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND GROUND) OR ELSEWHERE** • Measure the voltage at the following blower relay terminal. — Terminal D (GND signal) • Is the voltage **approx. 0 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the blower relay and ground, then go to Step 15.
7*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND BLOWER MOTOR) OR BLOWER RELAY** • Measure the voltage at the following blower relay terminal. — Terminal E (blower motor operation signal) • Is the voltage **approx. 12 V**?	Yes	Repair the wiring harness between the blower relay and blower motor, then go to Step 15.
		No	Replace the blower relay, then go to Step 15.

STEP	INSPECTION		ACTION
8*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER MOTOR OR ELSEWHERE** • Measure the voltage at the following blower motor terminal. — Terminal B (blower motor operation signal) • Is the voltage **approx. 12 V**?	Yes	Go to the next step.
		No	Inspect the blower motor, then go to Step 15.
9*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER MOTOR AND POWER MOS FET) OR ELSEWHERE** • Measure the voltage at the following terminal of power MOS FET. — Terminal B (blower motor operation signal) • Is voltage **approx. 12 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the blower motor and power MOS FET, then go to Step 15.
10*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND GROUND) OR ELSEWHERE** • Measure the voltage at the following power MOS FET terminal. — Terminal A (blower motor operation signal) • Is the voltage **approx. 0 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the power MOS FET and ground, then go to Step 15.
11	**INSPECT A/C UNIT** • Inspect the fan in A/C unit. — Is the fan free of interference with the A/C unit case? — Is the fan free of foreign material and obstruction? • Is the fan normal?	Yes	Go to the next step.
		No	Remove obstruction, repair or replace the fan and A/C unit case, then go to Step 15.
12*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER MOS FET OR ELSEWHERE** • Disconnect power MOS FET connector. • Measure the voltage at the following power MOS FET terminal. — Terminal B (blower motor control signal) • Is voltage **approx. 10 V**?	Yes	Replace the power MOS FET, then go to Step 15.
		No	Go to the next step.
13*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT) OR ELSEWHERE** • Turn the ignition switch to the LOCK position. • Disconnect climate control unit connector. • Inspect for continuity at the following terminals between the power MOS FET and climate control unit. — Terminal B—F (blower motor control signal) — Terminal C—D (blower motor feedback signal) • Is there continuity?	Yes	Go to the next step.
		No	Repair the wiring harness between the power MOS FET and climate control unit, then go to Step 15.
14*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (SHORT TO GROUND IN WIRING HARNESS BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT)** • Inspect for continuity at the following terminal between the power MOS FET and ground. — Terminal B (blower motor control signal)—ground • Is there continuity?	Yes	Repair the wiring harness between the power MOS FET and ground, then go to the next step.
		No	Replace the climate control unit, then go to the next step.

STEP	INSPECTION		ACTION
15	**CONFIRM THAT MALFUNCTION SYMPTOM DOES NOT RECUR AFTER REPAIR** • Is air discharged from vent?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.3 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

id070300800600

Manual Air Conditioner

3	**Amount of air blown from vents does not change.**
DESCRIPTION	• Malfunction in blower system
POSSIBLE CAUSE	• Blower relay, blower motor, resistor, fan switch malfunction • A/C unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BLOWER SYSTEM** • Inspect the following systems and electrical parts. — Blower relay (See 09-21-3 RELAY INSPECTION.) — Blower motor (See 07-40-17 BLOWER MOTOR INSPECTION.) — Resistor (See 07-40-19 RESISTOR INSPECTION.) — Fan switch (See 07-40-40 FAN SWITCH INSPECTION.) — Related wiring harnesses • Are they normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part, then go to Step 5.
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C UNIT OR ELSEWHERE** • Turn the ignition switch to the ON position. • Turn the fan switch on. • Recirculate air inside the vehicle. • Does the blower fan rotate smoothly?	Yes	Go to Step 4.
		No	Go to the next step.
3	**INSPECT A/C UNIT** • Inspect blower fan. — Is the fan free of interference from the A/C unit case? — Is the fan free of foreign material and obstructions? • Is the fan normal?	Yes	Go to the next step.
		No	Remove obstruction, repair or replace the fan and A/C unit case, then go to Step 5.
4	**INSPECT A/C UNIT INTAKE VENT** • Is the A/C unit intake vent clogged?	Yes	Remove obstruction, then go to the next step.
		No	Inspect if there are any obstructions in the A/C unit passage, then go to the next step.
5	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.4 AIR INTAKE MODE DOES NOT CHANGE

id070300800700

4	Air intake mode does not change.
DESCRIPTION	• Air intake mode does not change when switching REC/FRESH mode.
POSSIBLE CAUSE	• Air intake actuator malfunction • Air intake door malfunction

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, inspect to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR, WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to the ON position. • Measure the voltages at the following climate control unit terminals. — Terminal O (24-pin, FRESH motor drive signal) — Terminal Q (24-pin, RECIRCULATE motor drive signal) (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Are voltages normal?	Yes	Go to the next step.
		No	Go to Step 3.
2*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR)** • Measure the voltages at the following air intake actuator terminals. (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.) — Terminal E (FRESH motor drive signal) — Terminal C (RECIRCULATE motor drive signal) • Are voltages as shown below? (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.) — Terminal E: **approx. 0.5 V** during RECIRCULATE and **approx. 10 V** during FRESH — Terminal C: **approx. 10 V** during RECIRCULATE and **approx. 0.5 V** during FRESH	Yes	Replace the air intake actuator, then go to Step 8.
		No	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 8.
3	**INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR OR ELSEWHERE** • Disconnect the air intake actuator connector. • Measure the voltages at the following climate control unit terminals. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) — Terminal O (FRESH motor drive signal) — Terminal Q (RECIRCULATE motor drive signal) • Are voltages normal?	Yes	Inspect the air intake actuator, then go to Step 8.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Disconnect the climate control unit connector. • Measure the voltages at the following climate control unit terminals. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) — Terminal O (FRESH motor drive signal) — Terminal Q (RECIRCULATE motor drive signal) • Are voltages **approx. 0 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 8.
5	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to the LOCK position. • Inspect for continuity at the following terminals between the climate control unit and ground. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) — Terminal O (FRESH motor drive signal) — Terminal Q (RECIRCULATE motor drive signal) • Is there continuity?	Yes	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 8.
		No	Go to the next step.
6	**INSPECT AIR INTAKE LINK** • Inspect the air intake links. — Is there grease on link? — Are the links securely and properly installed? — Are the links free of obstructions and hindrances? • Are the above items normal?	Yes	Go to the next step.
		No	Apply grease to the links. If any the links are damaged, replace the air intake actuator, then go to Step 8.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR AIR INTAKE DOOR** • Inspect the A/C unit air intake door. — Is the door free of obstructions, cracks, and damage? — Are the doors securely and properly installed? • Are the above items normal?	Yes	Replace the climate control unit, then go to the next step. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/ INSTALLATION[FULL-AUTO AIR CONDITIONER].) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
		No	Remove obstruction, or install the doors in the proper position. If any doors are cracked or damaged, replace them, then go to the next step.
8	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does the air intake mode change smoothly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.5 TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT

id070300802800

5	**No temperature control with climate control unit**
DESCRIPTION	• Malfunction in A/C unit and/or climate control unit air mix system
POSSIBLE CAUSE	• A/C unit air mix link, air mix crank, air mix rod, air mix wire, wire clamp malfunction • Climate control unit rack-and-pinion, air mix wire malfunction • A/C unit air mix door malfunction • Heater piping malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COOLANT TEMPERATURE** • Is the coolant sufficiently warmed up?	Yes	Go to the next step.
		No	Warm up the engine, then go to Step 8.
2	**INSPECT A/C UNIT AIR MIX SYSTEM** • Inspect the A/C unit air mix links, air mix cranks, air mix rods, air mix actuator, and wire clamp. — Is there grease on links and cranks? — Are links, cranks, and rods securely installed in their proper positions? — Is wire clamp free of deformation? • Are the above items normal?	Yes	Go to the next step.
		No	Apply grease or install the links, cranks, and rods securely in their proper positions, repair or replace the air mix actuator or wire clamp, then go to Step 8.
3	**VERIFY THAT AIR MIX WIRE FROM A/C UNIT IS POSITIONED SECURELY AND CORRECTLY (IF AVAILABLE)** • Is the air mix wire securely installed in the correct position in relation to the A/C unit air mix links?	Yes	Go to the next step.
		No	Adjust the air mix wire or install securely in the correct position, then go to Step 8.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect the climate control unit. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is the climate control unit normal?	Yes	Go to the next step.
		No	Repair or replace the climate control unit, then go to Step 8. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/ INSTALLATION[FULL-AUTO AIR CONDITIONER].) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
5	**INSPECT A/C UNIT** • Is there any foreign material or obstruction in the A/C unit air mix doors?	Yes	Remove obstruction, then go to Step 8.
		No	Go to the next step.
6	**INSPECT A/C UNIT AIR MIX DOOR** • Is the A/C unit air mix door securely and properly installed?	Yes	Inspect the air mix door for cracks or damage, then go to the next step.
		No	Install the air mix door securely in the proper position, then go to the next step.
7	**INSPECT HEATER LINE** • Inspect the heater lines. — Is the heater piping free of damage and cracks? — Are the heater piping connections free of engine coolant leakage? — Are the heater piping connections securely tightened? — Are the heater piping installation points on A/C unit free of engine coolant leakage? • Are the above items normal?	Yes	Operation is normal. Recheck malfunction symptoms.
		No	If heater piping connections are loose, tighten the connections to the specified torque. Repair or replace the heater piping, then go to the next step.
8	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does the unit operate in every temperature setting?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.6 WINDSHIELD FOGGED

id070300800900

6	Windshield fogged.
DESCRIPTION	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
POSSIBLE CAUSE	• Climate control unit (B+ signal) system malfunction • Air intake actuator malfunction • Climate control unit (RECIRCULATE, FRESH signal) system malfunction • A/C unit air intake door malfunction

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, inspect to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**COOL AIR BLOW OUT INSPECTION** • When both the A/C and fan switch in the climate control unit are on, does cool air blow out from the front vent?	Yes	Go to the next step.
		No	Go to Step 1 of troubleshooting index No.7.
2	**INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL** • Is the climate control unit power supply fuse for B+ signal normal?	Yes	Go to the next step.
		No	Inspect for a short to ground on blown fuse circuit. • Repair or replace if necessary. Install appropriate amperage fuse.
3	**INSPECT AIR INTAKE ACTUATOR** • Inspect the air intake actuator. — Is there grease on the link? — Is the link securely and properly positioned? — Is the link free of obstructions? • Are the above items normal?	Yes	Go to the next step.
		No	Apply grease or install the link properly and securely, remove obstruction, then go to Step 14.
*4	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY** • Disconnect the climate control unit connector (24-pin). • Turn the ignition switch to the ON position. • Measure the voltage at climate control unit terminal J (B+ signal). (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is the voltage **approx. 12 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and climate control unit, then go to Step 14.
*5	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR VOLTAGE** • Measure the voltage at climate control unit terminal V (Ground). (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is the voltage **approx. 0V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the climate control unit and ground, then go to Step 14.

STEP	INSPECTION		ACTION
6	**VERIFY WHETHER MALFUNCTION IS IN A/C UNIT AIR INTAKE DOOR OR ELSEWHERE** • Turn the ignition switch to the LOCK position. • Connect the climate control unit connector (24-pin). • Remove the air intake actuator. • Turn the ignition switch to the ON position. • Set the fan switch to 4th position. • Does the air intake mode (RECIRCULATE, FRESH) change smoothly when the air intake link is operated by hand?	Yes	Go to the next step.
		No	Go to Step 12.
7	**INSPECT AIR INTAKE ACTUATOR** • Inspect the air intake actuator. (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.) • Is it normal?	Yes	Go to the next step.
		No	Replace the air intake actuator, go to Step 14.
8	**INSPECT AIR INTAKE SELECTOR SWITCH AND DEFROSTER SWITCH IN CLIMATE CONTROL UNIT** • Measure the voltage at climate control unit connector (24-pin) terminals O and Q. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is it normal?	Yes	Go to the next step.
		No	Replace the climate control unit, then go to Step 14. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/ INSTALLATION[FULL-AUTO AIR CONDITIONER].) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
*9	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn the ignition switch to the LOCK position. • Is there continuity between the following climate control unit terminals and air intake actuator terminals? (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.) — Terminal E —Terminal O (FRESH signal) — Terminal C —Terminal Q (RECIRCULATE signal)	Yes	Go to the next step.
		No	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 14.
*10	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between the following climate control unit terminals and ground? (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) — Terminal O (FRESH signal) — Terminal Q (RECIRCULATE signal)	Yes	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 14.
		No	Go to the next step.

STEP	INSPECTION		ACTION
*11	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn the ignition switch to the ON position. • Measure the voltage at the following climate control unit terminals. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) — Terminal O (FRESH signal) — Terminal Q (RECIRCULATE signal) • Is the voltage **approx. 12 V**?	Yes	Repair the wiring harness between the climate control unit and air intake actuator, then go to Step 14.
		No	Replace the climate control unit, then go to Step 14. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/ INSTALLATION[FULL-AUTO AIR CONDITIONER].) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
12	**INSPECT A/C UNIT AIR INTAKE DOOR** • Is there any foreign material or obstruction in the A/C unit air intake door?	Yes	Remove obstruction, then go to Step 14.
		No	Go to the next step.
13	**VERIFY THAT A/C UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY** • Is the A/C unit air intake door securely and properly positioned?	Yes	Inspect the air intake door for cracks or damage, then go to the next step.
		No	Install the air intake door securely in the proper position, then go to the next step.
14	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does the malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.7 AIR FROM VENTS NOT COLD ENOUGH

id070300801000

7	Air from vents not cold enough.
DESCRIPTION	• Magnetic clutch operates but A/C system malfunctions.
POSSIBLE CAUSE	• Drive belt malfunction • A/C unit or condenser malfunction • Receiver/drier or expansion valve malfunction (valve closes too much) • Malfunction in refrigerant lines • A/C compressor system malfunction, insufficient compressor oil • Over filling of compressor oil, malfunction in expansion valve or A/C unit air mix link system

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVE BELT** • Inspect the drive belt. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Adjust or replace the drive belt, then go to Step 20.
2	**INSPECT REFRIGERANT SYSTEM PERFORMANCE** • Perform refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.) • Is the operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to the next step.
3	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C UNIT INTAKE AND CONDENSER OR ELSEWHERE** • Are the refrigerant high-pressure and low-pressure values both high?	Yes	Go to the next step.
		No	Go to Step 6.
4	**INSPECT A/C UNIT INTAKE** • Is the A/C unit intake clogged?	Yes	Remove obstruction, then go to Step 20. (If air does not reach the evaporator in the A/C unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to the next step.
5	**INSPECT CONDENSER** • Inspect the condenser. (See 07-11-19 CONDENSER INSPECTION.) • Is it normal?	Yes	Adjust refrigerant to the specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace the condenser, or repair and clean the condenser fins, then go to Step 20.
6	**INSPECT TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE** • Are the refrigerant high-pressure and low-pressure values low?	Yes	Go to the next step.
		No	Go to Step 14.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/ DRIER OR ELSEWHERE** • Immediately after the A/C compressor operates, does the refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to the next step.
		No	Go to Step 10.
8	**INSPECT TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/ DRIER** • Turn the A/C switch off and let the air conditioner stop for **10 min.** • Start the engine. • Turn the both A/C switch and fan switch on. • Does the malfunction occur after the A/C compressor turns on?	Yes	Go to the next step.
		No	Replace the condenser and bleed refrigerant line for **30 min or more** using a vacuum pump, add refrigerant to the specified level, then go to Step 20. (Since water has intermixed in the receiver/drier and it is saturated, replacement is necessary.)
9	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is the expansion valve heat-sensing tube in the A/C unit securely installed in the proper position?	Yes	Replace the expansion valve, then go to Step 20. (Since the valve closes too much, replacement is necessary.)
		No	Install the heat-sensing tube securely in the proper position, then go to Step 20.

STEP	INSPECTION		ACTION
10	**INSPECT REFRIGERANT LINE** • Inspect the refrigerant lines. — Is the piping free of damage and cracks? — Are the piping connections free of oil grime? (Visual inspection) — Are the piping connections free of gas leakage? — Are the piping installation points on the condenser free of gas leakage? — Are the piping installation points on the receiver/drier free of gas leakage? — Are the piping installation points on the A/C compressor free of gas leakage? — Are the piping installation points on the A/C unit free of gas leakage? — Perform gas leakage inspection using a gas leak tester. • Are the above items normal?	Yes	Go to the next step.
		No	If the piping or A/C component (s) are damaged or cracked, replace them. Then go to Step 20. If there is no damage, go to Step 13.
11	**INSPECT EVAPORATOR PIPING CONNECTION IN A/C UNIT FOR GAS LEAKAGE** • Are piping the connections for the evaporator in the A/C unit free of gas leakage?	Yes	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to the specified amount, then go to Step 20.
		No	If the piping is damaged or cracked, replace it. Then go to Step 20. If there is no damage, go to the next step.
12	**INSPECT EVAPORATOR PIPING CONNECTION IN A/C UNIT FOR LOOSE** • Are the piping connections for the evaporator in the A/C unit loose?	Yes	Tighten the connections to the specified torque, adjust both compressor oil and refrigerant to the specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace the O-ring on piping, adjust refrigerant to the specified amount, then go to Step 20.
13	**INSPECT PIPING CONNECTION FOR LOOSE** • Are the piping connections loose?	Yes	Tighten the connections to the specified torque, adjust both compressor oil and refrigerant to the specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
14	**INSPECT TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE** • Does the refrigerant high-pressure value hardly increase?	Yes	Go to the next step. (Pressure hardly increases.)
		No	Go to Step 17.
15	**INSPECT TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE** • When the engine is racing, does the high-pressure value increase?	Yes	Return to Step 3.
		No	Go to the next step.
16	**INSPECT TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR** • After compressor oil is replenished each **10 ml {10 cc, 0.34 fl oz}**, does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace the A/C compressor, then go to Step 20. (Cause is defective A/C compressor.)
17	**INSPECT TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE** • Is only refrigerant low-pressure value high?	Yes	Go to Step 19.
		No	Go to the next step.

STEP	INSPECTION		ACTION
18	**VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY** • Are the A/C unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Set the fan switch to 4th position. Turn the A/C switch on. Set FRESH mode. Set temperature control to MAX COLD. Set VENT mode. (1)Start and run the engine at **1,500 rpm** for **10 min**. (2)Run the engine at idle for **1 min**. (3)Within **12 s**, idle → **4,000 rpm** → idle. Perform cycle **5 times**. (4) Run the engine at idle for **30 s**. (5)Drain the compressor oil completely from the A/C compressor and verify the amount. • If there is **approx. 90 ml {90 cc, 3.0 fl oz}** of compressor oil, go to Step 20. • If there is **more than 90 ml {90 cc, 3.0 fl oz}** of compressor oil, remove surplus oil and fill the A/C compressor with **90 ml {90 cc, 3.0 fl oz}** of compressor oil. Repeat Steps (1) to (5). (Cause is excessive amount of compressor oil.)
		No	Repair or install the links, cranks and rods securely in the proper position, then go to Step 20.
19	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is the expansion valve heat-sensing tube in the A/C unit securely installed in the proper position?	Yes	Replace the expansion valve, then go to the next step. (Since the valve opens too much, replacement is necessary.)
		No	Install the heat-sensing tube securely in the proper position, then go to the next step.
20	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does cool air blow out? (Are results of refrigerant system performance test normal?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.8 NO COOL AIR

id070300801100

8	No cool air
DESCRIPTION	• Magnetic clutch does not operate.
POSSIBLE CAUSE	• Malfunction in PCM A/C cut control system • Malfunction in climate control unit • Malfunction in refrigerant pressure switch • Malfunction in magnetic clutch • Malfunction in PCM (IG1 signal) • Malfunction in A/C compressor • Malfunction in A/C relay • Malfunction in evaporator temperature sensor

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIR BLOW OUT** • Does air blow out?	Yes	Go to the next step.
		No	Go to Step 1 of troubleshooting indexes No.1 and 2.
2	**INSPECT FUSE** • Are the A/C relay power supply fuses normal?	Yes	Go to the next step.
		No	Replace the fuse, then go to Step 5. If fuse burns out immediately, go to the next step.
3	**INSPECT A/C COMPRESSOR OPERATION** • Start the engine. • Turn the A/C switch and fan switch on. • Does the A/C compressor operate?	Yes	Go to Step 1 of troubleshooting index No.7.
		No	Go to Step1 of troubleshooting index No.23. (See 01-03A-58 NO.23 A/C DOES NOT WORK SUFFICIENTLY[LF, L3].)
4	**INSPECT EVAPORATOR TEMPERATURE SENSOR** • Inspect the evaporator temperature sensor. • Is it normal?	Yes	Go to the next step.
		No	Replace the evaporator temperature sensor, then go to the next step.
5	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does cool air blow out? (Are the results of refrigerant system performance test normal?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.9 NOISE WHILE OPERATING A/C SYSTEM

id070300801200

9	Noise while operating A/C system.
DESCRIPTION	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.
POSSIBLE CAUSE	• Magnetic clutch operation noise • A/C compressor slippage noise • Hose or refrigerant line interference noise

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT A/C COMPRESSOR SLIPPAGE NOISE** • Is there a squeaking or whirling sound (A/C compressor slippage noise)?	Yes	Go to Step 12.
		No	Go to the next step.
2	**INSPECT A/C COMPRESSOR INTERFERENCE NOISE** • Is there a rattling or vibrating sound (interference noise)?	Yes	Go to Step 16.
		No	Go to the next step.
3	**INSPECT MAGNETIC CLUTCH OPERATION NOISE** • Is there a clicking sound (magnetic clutch operation noise)?	Yes	Adjust the clearance between the pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 17. (See 07-40-21 MAGNETIC CLUTCH ADJUSTMENT.)
		No	Condition is normal. (Recheck malfunction symptoms.) Go to the next step.
4	**INSPECT IDLE SPEED** • Inspect idle speed. (See 01-10A-37 ENGINE TUNE-UP[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Follow the repair instruction described in section 01-40, then go to Step 17.
5	**INSPECT REFRIGERANT AMOUNT** • Inspect refrigerant amount. • Is it normal?	Yes	Go to Step 8.
		No	Go to the next step.
6	**INSPECT REFRIGERANT LINES** • Inspect the refrigerant lines. — Is the piping free of damage and cracks? — Are the piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are the piping installation points on the condenser free of gas leakage? — Are the piping installation points on the receiver/drier free of gas leakage? — Are the piping installation points on the A/C compressor free of gas leakage? — Are the piping installation points on the A/C unit free of gas leakage — Perform gas leakage inspection using a gas leak tester. • Are the above items normal?	Yes	Go to the next step.
		No	If the piping or A/C component (s) is damaged or cracked, replace them, then go to Step 17. If there is gas leakage, repair or replace connection and replace the condenser*, then go to Step 17.
7	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE** • Are the piping connections for the evaporator in the A/C unit free of gas leakage?	Yes	Adjust refrigerant amount to the specified level, then go to Step 17.
		No	If the piping is damaged or cracked, replace it them, then go to Step 17. If there is gas leakage, repair or replace the connecting parts and replace the condenser*, then go to Step 17.
8	**INSPECT TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL OR ELSEWHERE** • Add **20 ml {20 cc, 0.8 fl oz}** of compressor oil. • Is noise heard when racing the engine?	Yes	Go to the next step.
		No	Troubleshooting completed. Explain repair to customer.
9	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Drain compressor oil. • Is it contaminated with metal particles?	Yes	Go to the next step.
		No	Replace the A/C compressor, then go to Step 17.

STEP	INSPECTION		ACTION
10	**INSPECT TO SEE WHETHER MALFUNCTION IS SOMEWHERE IN A/C SYSTEM OR ELSEWHERE** • Is compressor oil whitish and mixed with water?	Yes	Replace entire A/C system (excluding heater), then go to Step 17.
		No	Go to the next step.
11	**INSPECT A/C COMPRESSOR OIL** • Is compressor oil darker than normal and contaminated with aluminum chips?	Yes	Replace the A/C compressor and condenser, then go to Step 17. (Since the A/C compressor may be worn and receiver/drier may be clogged, replacement of the receiver/drier is necessary.)
		No	Condition is normal. Recheck malfunction symptoms.
12	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Is noise heard immediately after the A/C compressor is stopped?	Yes	Replace the A/C compressor, then go to Step 17. (A/C compressor discharge valve left open)
		No	Go to the next step.
13	**INSPECT DRIVE BELT** • Inspect drive belt. (See 01-10A-3 DRIVE BELT INSPECTION[LF, L3].) • Is it normal?	Yes	Go to the next step.
		No	Adjust or replace drive belt, then go to Step 17.
14	**INSPECT DRIVE BELT CONDITION** • Is the drive belt worn? • Does it have foreign material imbedded in it, or have oil on it?	Yes	Remove obstruction, remove oil, or replace the drive belt, then go to Step 17.
		No	Go to the next step.
15	**INSPECT MAGNETIC CLUTCH** • Inspect the magnetic clutch. (See 07-40-22 MAGNETIC CLUTCH INSPECTION[LF, L3].) • Is it normal?	Yes	Replace the A/C compressor (excluding the pressure plate, A/C compressor pulley, and stator), then go to Step 17.
		No	Replace the magnetic clutch, then go to Step 17.
16	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINE** • Is noise emitted from the A/C compressor?	Yes	Visually inspect the A/C compressor, replace appropriate parts if necessary, then go to the next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to the next step.
17	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Has A/C compressor noise stopped?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

* : If there is gas leakage, air enters into the A/C system. The desiccant within the receiver/drier absorbs the moisture from the air and becomes saturated. If the A/C system is used in this condition, the inside of the A/C compressor will begin to rust due to this moisture, which may cause lock up or noise to occur. Therefore, replacement of the receiver/drier is necessary.

07-10 REFRIGERANT SYSTEM

REFRIGERANT SYSTEM SERVICE WARNINGS

id071000800100

Handling Refrigerant

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, we urge use of recovery/recycling/recharging equipment when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**
- **Do not perform pressure test or leak test for R-134a service equipment and/or vehicle air conditioning system using compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**
- **Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above-mentioned heat sources and maintain adequate ventilation.**
- **Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.**

Storing Refrigerant

- **The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40 °C {104 °F}.**

REFRIGERANT SYSTEM SERVICE CAUTIONS

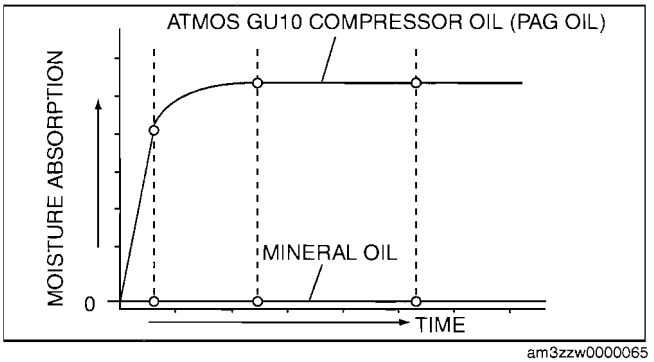
id071000800200

Handling Insufficient Refrigerant Level

- **If an insufficient refrigerant level is detected at troubleshooting, do not charge (add) the refrigerant. Because an accurate amount of refrigerant cannot be determined from the pressure indicated on the manifold gauge, never charge the refrigerant. If there is too much or too little refrigerant from the refilling, there may be secondary problems such as damage to the refrigerant cycle parts, or a decrease of cooling performance. Therefore, if it is determined that the refrigerant level is insufficient, completely remove refrigerant from the refrigerant cycle and refill with refrigerant to the specified amount.**

Handling Compressor Oil

- **Use only ATMOS GU10 compressor oil for this vehicle. Using a PAG oil other than ATMOS GU10 compressor oil can damage the A/C compressor.**
- **Do not spill ATMOS GU10 compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.**
- **ATMOS GU10 compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.**
- **If the refrigerant gas is completely discharged from the system for reasons such as a malfunction during A/C operation, repair or replace the malfunctioning part, charge the refrigerant to the specified amount and always add 60 ml {60 cc, 2.03 fl oz} of compressor. If the compressor oil is not adequately replenished, the A/C compressor may quickly deteriorate, abnormal noise may develop, cooling performance may be affected or, in the worst case, the A/C compressor may seize.**

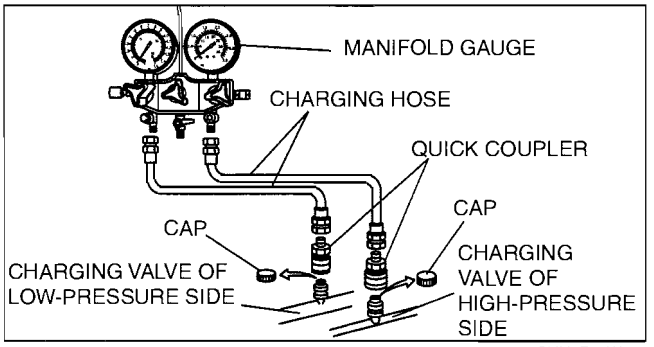


am3zzw0000065

REFRIGERANT SYSTEM GENERAL PROCEDURES

id071000800300

1. Fully close the valves of the manifold gauge.
2. Connect the charging hoses to the high- and low-pressure side joints of the manifold gauge.
3. Connect the quick couplers to the ends of the charging hoses.
4. Connect the quick couplers to the charging valves.



CHU0710W004

REFRIGERANT CHARGING

id071000800400

Caution

- **Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.**

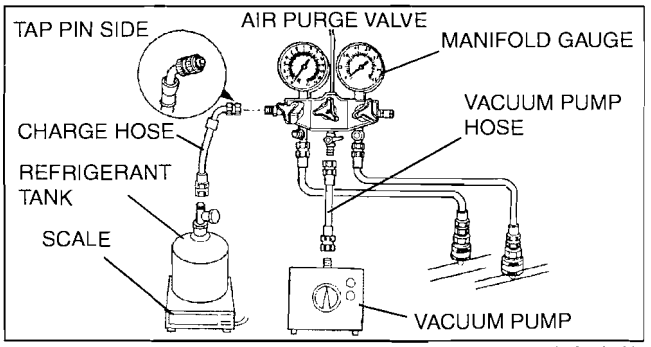
Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

Charging Preparation

1. Install the manifold gauge set.
2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.
3. Connect the vacuum pump hose to the center joint of the manifold gauge.
4. Connect the vacuum pump hose to the vacuum pump.
5. Connect the charging hose to the refrigerant tank.
6. Place the refrigerant tank on the scale.

Regular amount of refrigerant (approx. quantity)
475—525 g {16.8—18.5 oz}



chu0710w008

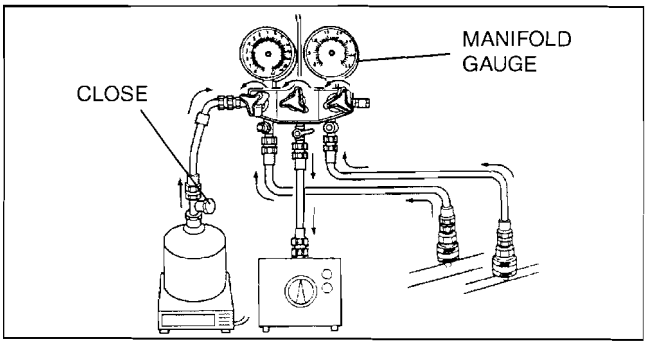
Evacuation

1. Open all the valves of the manifold gauge.

Caution

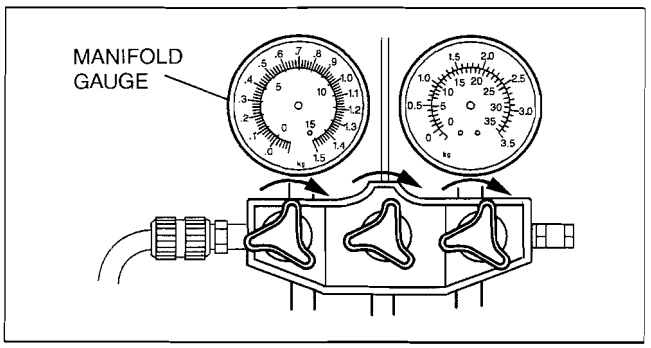
- **Close the manifold gauge valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will flow back into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.**

2. Start the vacuum pump and let it operate for **15 min**.



chu0710w009

3. Verify that high- and low-pressure side readings of the manifold gauge are at **–101 kPa {–760 mmHg, –29.9 inHg}**. Close each valve of the manifold gauge.



am3uuw0000081

Airtightness Check

1. Stop the vacuum pump and wait for **5 min**.
2. Check the high- and low-pressure side readings of the manifold gauge.
   - If the reading has changed, inspect for leakage and go to Evacuation. (See 07-10-3 Evacuation.)
   - If the reading has not changed, go to Charging New R-134a Refrigerant. (See 07-10-4 Charging New R-134a Refrigerant.)

Charging New R-134a Refrigerant

1. Open the valve of the refrigerant tank.
2. Weigh the refrigerant tank to charge the suitable amount of refrigerant.

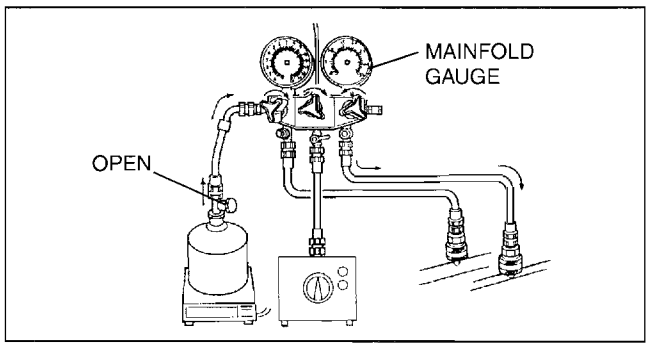
Warning

- **If the refrigerant system is charged with a large amount of refrigerant when inspecting for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when inspecting for gas leakage.**
- **If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

Caution

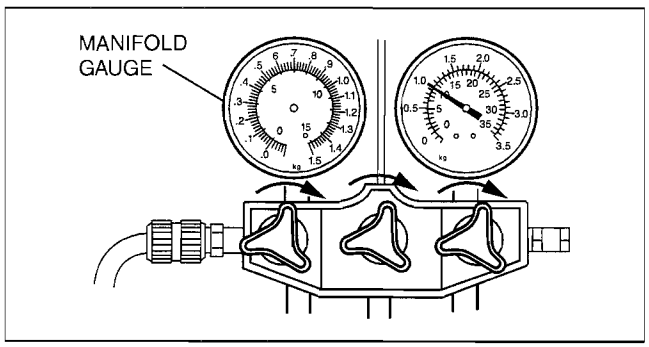
- **Always being charging of refrigerant from the high-pressure side. If changing is begun from the low-pressure side, the vanes of the A/C compressor will not be released and abnormal noise may result.**

3. Open the high-pressure side valve of the manifold gauge.



c3u0710w008

4. When the low-pressure side reading increases to **0.098 MPa {1.0 kgf/cm^2, 14 psi}**, close the high-pressure side valve of the manifold gauge.
5. Inspect for leakage from the cooler pipe/hose connections using a gas leak tester.
   - If there is no leakage, go to Step 7.
   - If leakage is found at a loose joint, tighten the joint, then go to the next step.
6. Inspect for leakage again.
   - If there is no leakage after tightening the joint, go to the next step.
   - If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from evacuation.

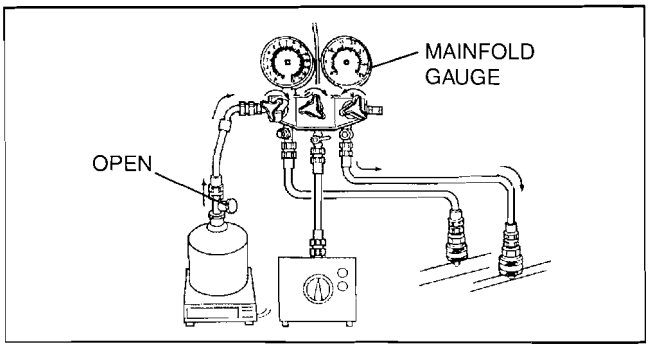


am3uuw0000081

Warning

- **If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

7. Open the high-pressure side valve of the manifold gauge and charge with refrigerant until the weight of refrigerant tank has decreased **238—263 g {8.40—9.28 oz}** from the amount in Step 2.

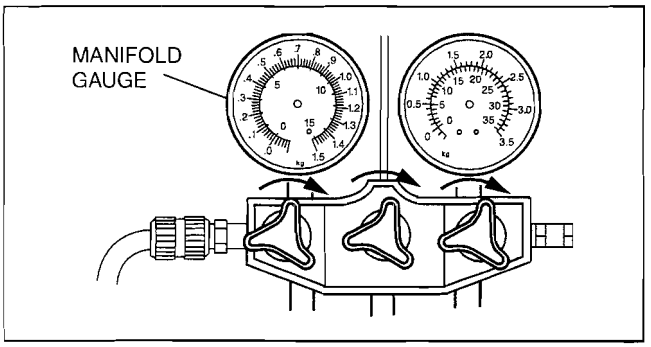


c3u0710w008

8. Close the low-pressure side valve of the manifold gauge.

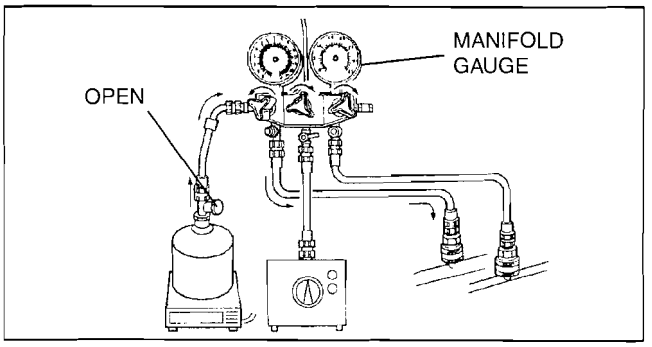
Warning

- **If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**



am3uuw0000081

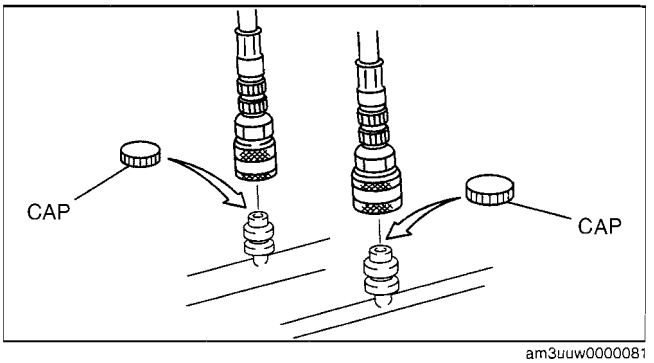
9. Start the engine and actuate the A/C compressor.
10. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of the refrigerant tank has decreased regular amount from the amount in Step 2.
11. Close the low-pressure side valve of the manifold gauge and the valve of the refrigerant tank.
12. Stop the engine and A/C compressor.



chu0710w010

Leak Test

1. Inspect for leakage using the a gas leak tester.
   - If there is no leakage, go to Step 3.
   - If leakage is found at a loose joint, tighten the joint, then go to the next step.
2. Inspect for leakage again.
   - If there is no leakage after tightening the joint, go to the next step.
   - If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from evacuation.
3. Disconnect the manifold gauge from the charging valves.
4. Install the caps to the charging valves.



am3uuw0000081

REFRIGERANT RECOVERY

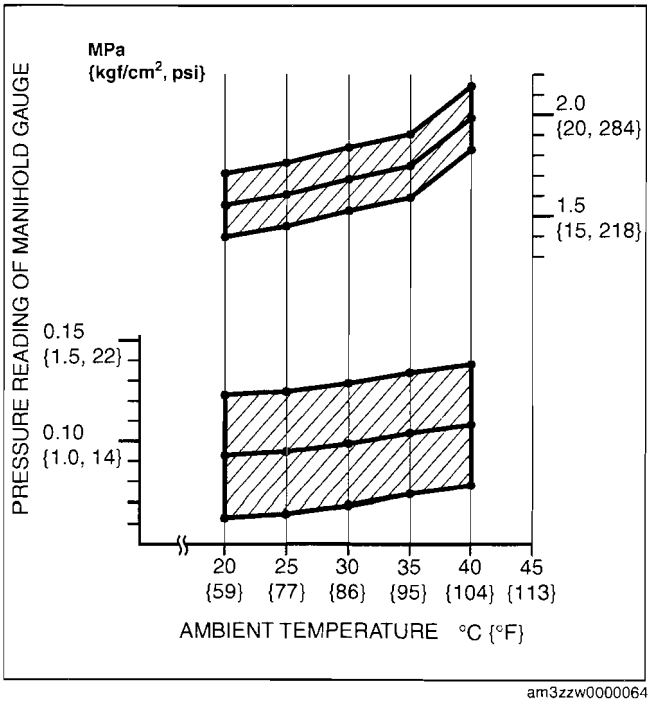
id071000800500

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

REFRIGERANT PRESSURE CHECK

id071000800600

1. Install the manifold gauge. (See 07-10-2 REFRIGERANT SYSTEM GENERAL PROCEDURES.)
2. Start the engine and after it is warmed up, run it at a constant **1,500 rpm**.
3. Set the fan speed MAX HI.
4. Turn the A/C switch on.
5. Set to RECIRCULATE mode.
6. Set the temperature control to MAX COLD.
7. Set to VENT mode.
8. Close all the doors and all the windows.
9. Measure the ambient temperature and high- and low- pressure side reading of the manifold gauge.
10. Verify that the intersection of the pressure reading of the manifold gauge and ambient temperature is in the shaded zone.
    - If there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.

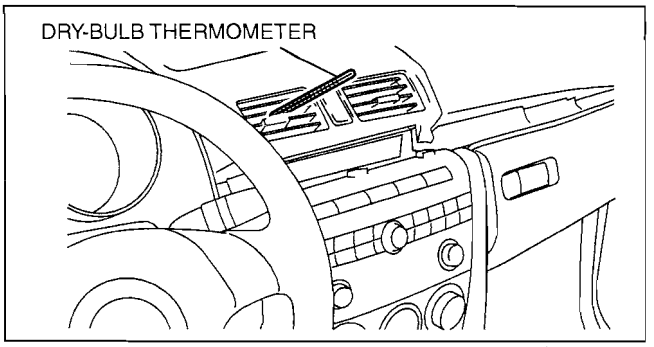


am3zzw0000064

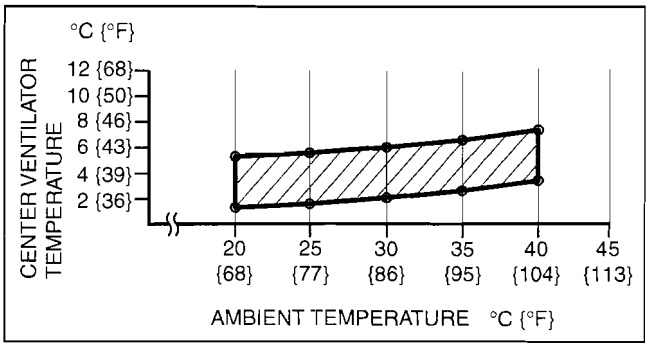
REFRIGERANT SYSTEM PERFORMANCE TEST

id071000800700

1. Inspect the refrigerant pressure. (See 07-10-6 REFRIGERANT PRESSURE CHECK.)
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Start the engine and after it is warmed up, run it at a constant **1,500 rpm**.
4. Set the fan speed to MAX HI.
5. Turn the A/C switch on.
6. Set to RECIRCULATE mode.
7. Set the temperature control to MAX COLD.
8. Set to VENT mode.
9. Close all the doors and windows.
10. Wait until the air conditioner output temperature stabilizes.
    Stabilized condition
    - The A/C compressor repeatedly turns on and off at regular intervals.
11. After the blower air is stabilized, read the dry-bulb thermometer.
12. Verify the ambient temperature.
13. Verify that the temperature reading is in the shaded zone.
    - If the there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.



d3u710zw6001

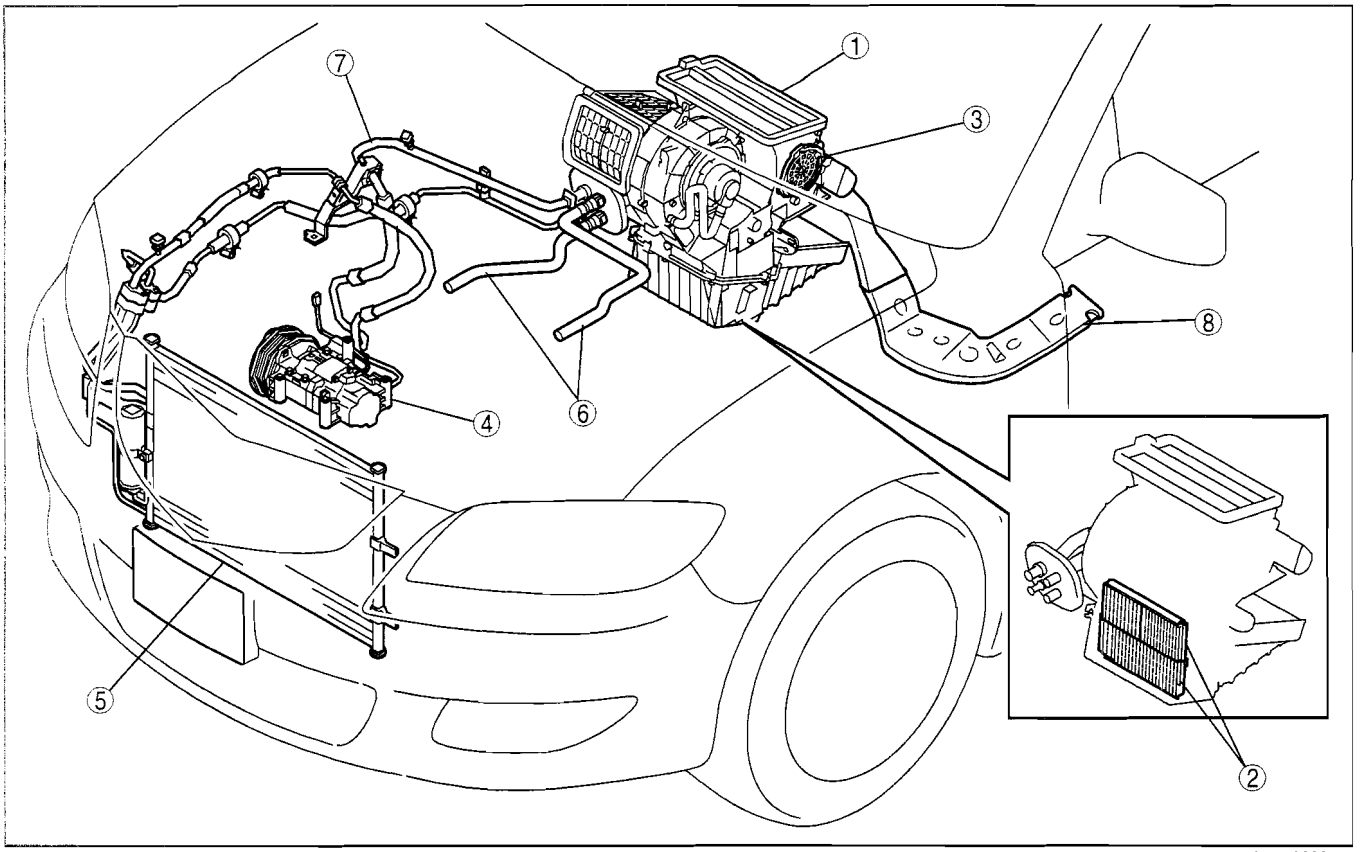


am3zzw0000065

07-11 BASIC SYSTEM

HVAC BASIC SYSTEM LOCATION INDEX

id071100801700



am3uuw0000062

1	A/C unit (See 07-11-3 A/C UNIT REMOVAL/ INSTALLATION.) (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].) (See 07-11-10 A/C UNIT DISASSEMBLY/ ASSEMBLY[MANUAL AIR CONDITIONER].) (See 07-11-11 EXPANSION VALVE REMOVAL/ INSTALLATION.) (See 07-11-13 EVAPORATOR INSPECTION.) (See 07-11-13 HEATER CORE INSPECTION.)
2	Cabin air filter (See 07-11-12 CABIN AIR FILTER REMOVAL/ INSTALLATION.) (See 07-11-12 CABIN AIR FILTER INSPECTION.)
3	Airflow mode main link (See 07-11-13 AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION.)

4	A/C compressor (See 07-11-15 A/C COMPRESSOR REMOVAL/ INSTALLATION[LF, L3].) (See 07-11-16 A/C COMPRESSOR REMOVAL/ INSTALLATION[L3 WITH TC].)
5	Condenser (See 07-11-18 CONDENSER REMOVAL/ INSTALLATION.) (See 07-11-19 CONDENSER INSPECTION.)
6	Heater hose
7	Refrigerant line (See 07-11-21 REFRIGERANT LINES REMOVAL/ INSTALLATION[LF, L3].) (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)
8	Rear heat duct (See 07-11-14 REAR HEAT DUCT REMOVAL/ INSTALLATION.)

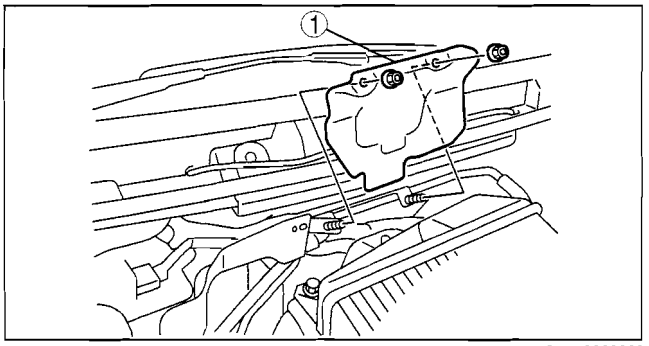
A/C UNIT REMOVAL/INSTALLATION

id071100800200

1. Disconnect the negative battery cable.
2. Discharge the refrigerant. (See 07-10-2 REFRIGERANT CHARGING.)
3. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].) (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
4. Remove the charge air cooler cover. (L3 with TC)
5. Disconnect from the A/C unit in the order indicated in the table.

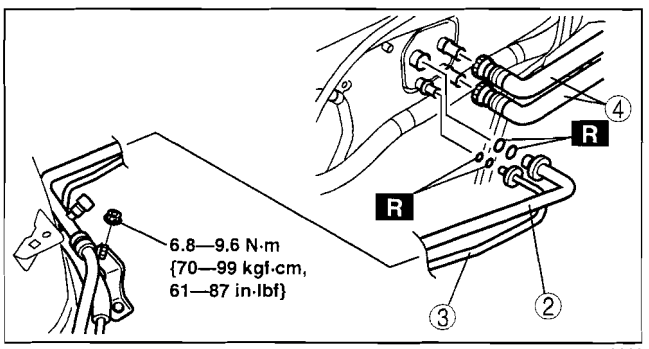
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**



am3uuw0000060

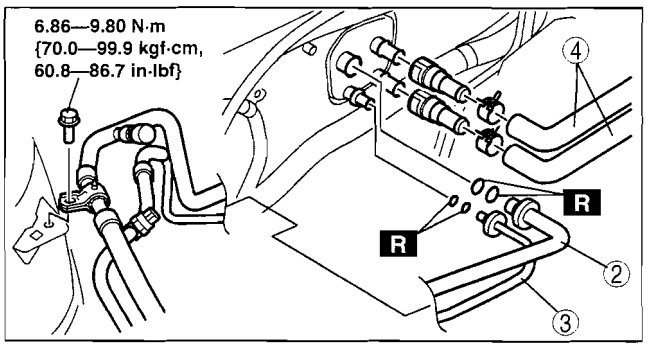
LF, L3



am3uuw0000060

L3 with TC

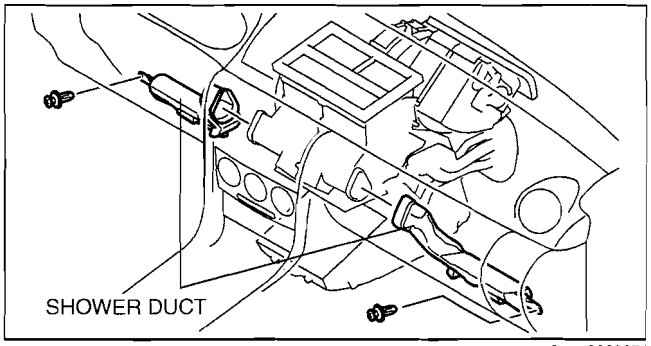
1	Insulator (L3 with TC)
2	Cooler hose (LO) (See 07-11-21 REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3].)
3	Cooler pipe (See 07-11-21 REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3].)
4	Heater hose



am3uuw0000060

6. Remove the following parts:
   (1) Front doors (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (5) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (6) PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
   (7) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
   (8) Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
   (9) Ashtray panel
   (10) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)

(11)Shift lever component (MTX) (See 05-16-1 SHIFT MECHANISM REMOVAL/INSTALLATION[G35M-R]05-16-2 SHIFT MECHANISM REMOVAL/INSTALLATION[A26M-R].)
(12)Selector lever component (ATX) (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)
(13)Center panel unit (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.)
(14)Hood release lever from the lower panel
(15)Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
(16)Shower ducts (LH, RH)
(17)Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
(18)Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
(19)Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
(20)Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
(21)Steering shaft (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)

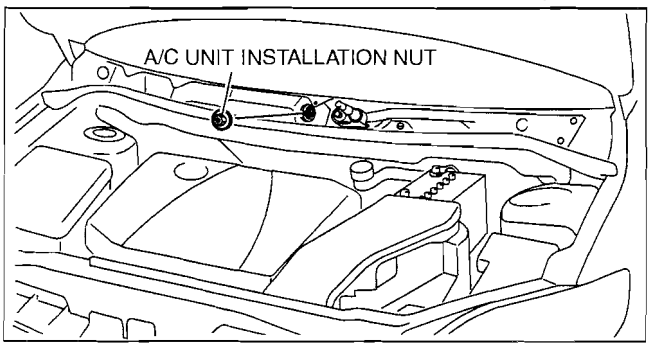


am3zzw0000071

(22)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
(23)Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
(24)Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
(25)Cowl panel (See 09-10-20 COWL PANEL REMOVAL/INSTALLATION.)
(26)Windshield wiper motor (See 09-19-4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.)

7. Remove the A/C unit installation nut from the engine compartment, then remove the A/C unit.

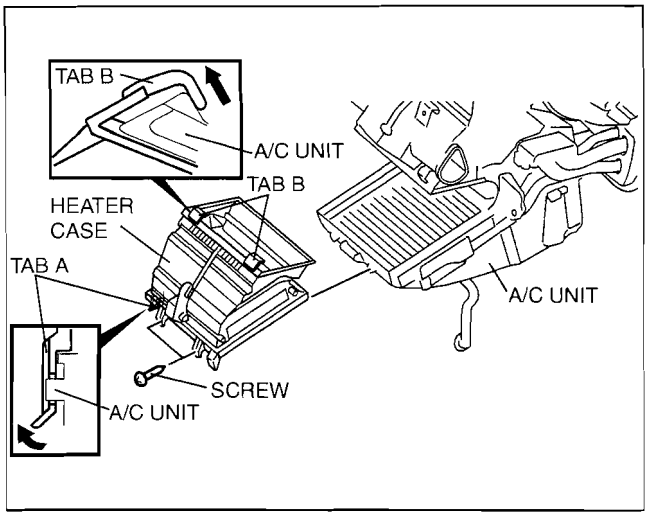
Caution
- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**



am3zzw0000071

8. Remove the rear heat duct (1).
9. Disconnect the drain hose connected to the A/C unit. (See 07-11-6 Drain Hose Installation Note.)
10. Remove the nuts and bolts for installing the dashboard to the body.
11. Remove the dashboard with A/C unit. (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
12. Disconnect the air mix wire and airflow mode wire from the A/C unit with the wire clamps installed. (Manual air conditioner) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
13. Disconnect the following connectors:
    — Blower motor connector
    — Power MOS FET connector (Full-auto air conditioner)
    — Evaporator temperature sensor connector
    — Air intake actuator connector
    — Air mix actuator connector (Full-auto air conditioner)
    — Airflow mode actuator connector (Full-auto air conditioner)
    — Resistor connector. (Manual air conditioner)

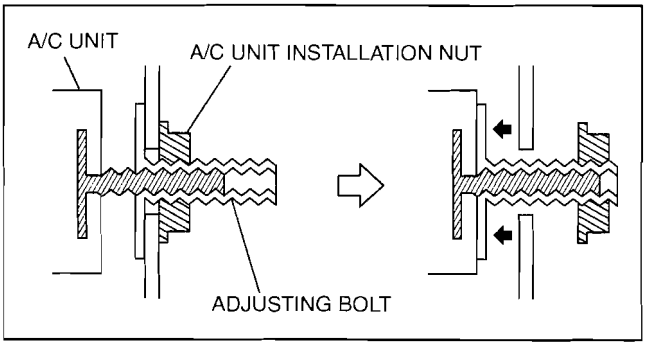
14. Remove the heater case.
    1. Remove the screws.
    2. Pull up tab A in the direction shown by the arrow in the figure and remove it from the A/C unit.
    3. Pull up tabs B in the direction shown by the arrow in the figure and remove it from the A/C unit.
15. Remove the nuts and bolts for installing the A/C unit to the dashboard.
16. Install in the reverse order of removal.
17. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
18. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



am3zzw0000071

A/C Unit Installation Nut Removal Note

Note
- If the adjusting bolt rotates when removing the A/C unit nut, keep rotating the nut. The adjusting bolt stops rotating when it contacts the A/C unit and the nut can be removed.



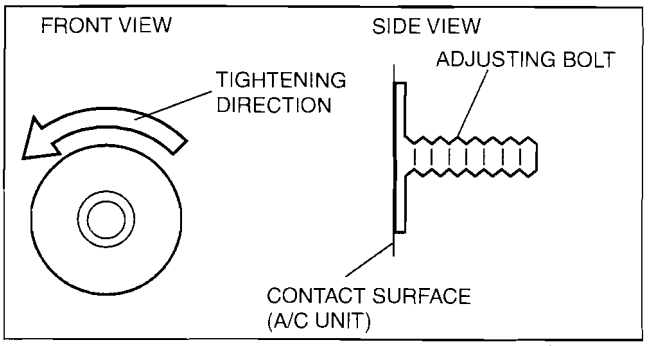
am3zzw0000071

A/C Unit Installation Note

1. When replacing the A/C unit or evaporator, add compressor oil to the refrigerant cycle.

   Supplemental oil amount (approx. quantity)
   25 ml {25 cc, 0.8 fl oz}

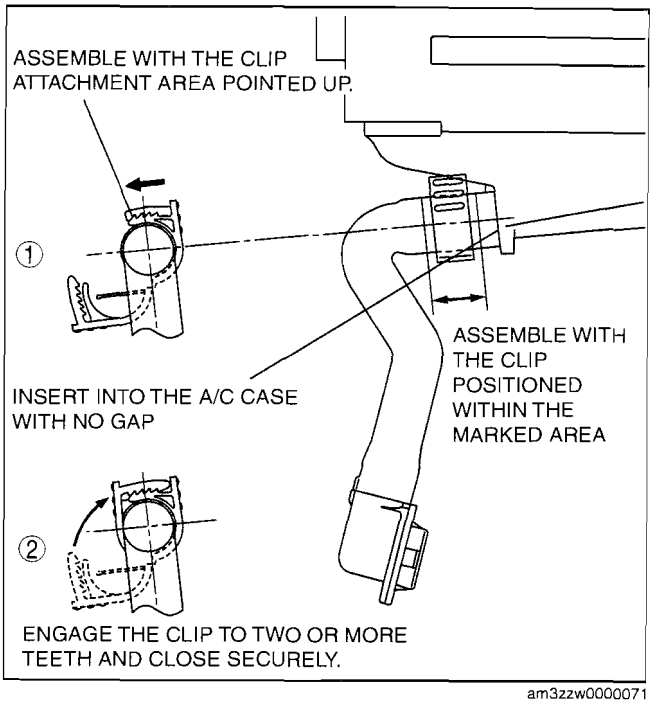
2. Tighten the A/C unit adjusting bolt until it lightly touches the A/C unit.



am3zzw0000071

Drain Hose Installation Note

1. Install the clip as shown in the figure.



am3zzw0000071

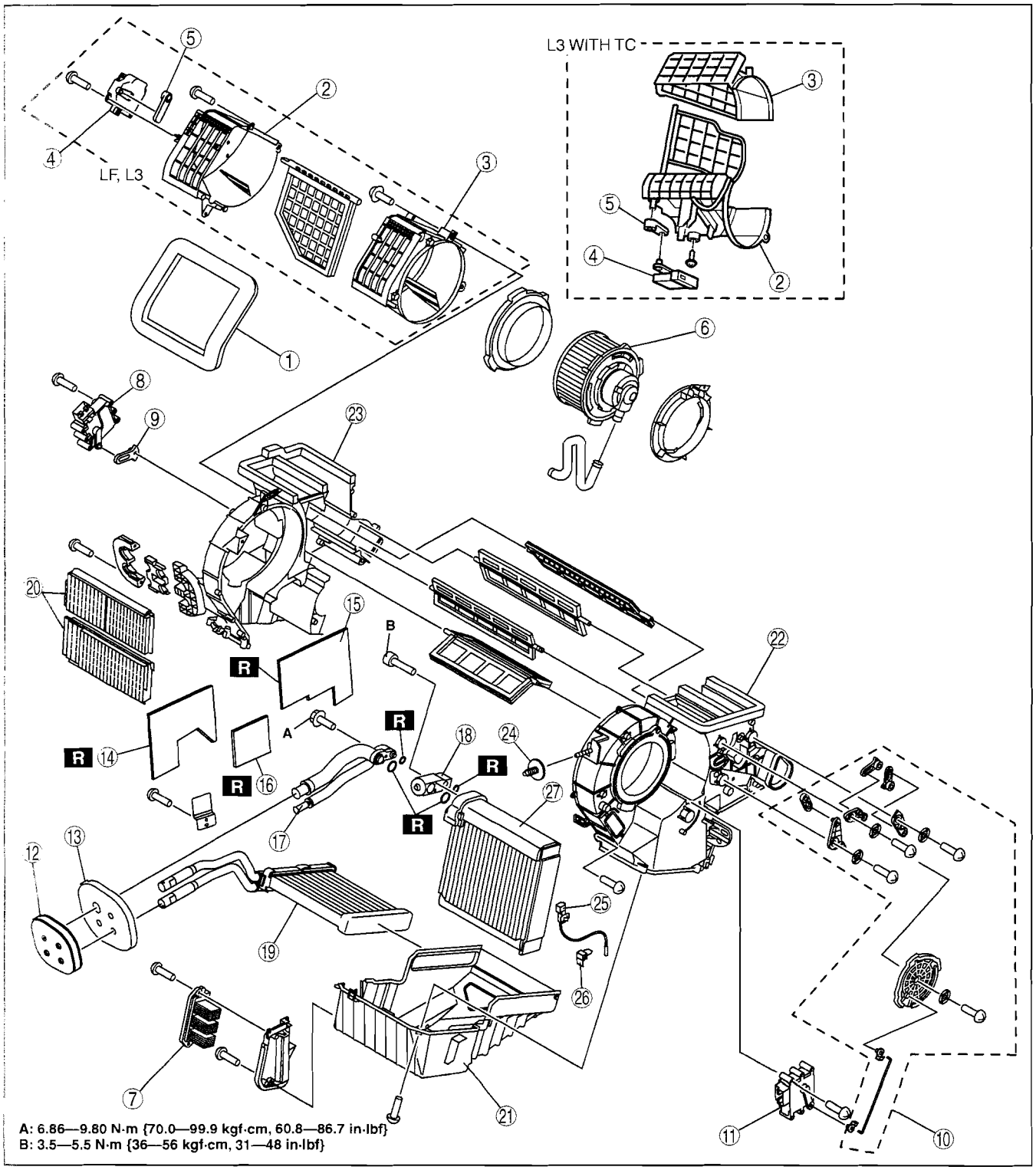
A/C UNIT DISASSEMBLY/ASSEMBLY[FULL-AUTO AIR CONDITIONER]

id0711008003a1

1. Disassemble in the order indicated in the table.

Caution

- **If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.**



am3uuw0000060

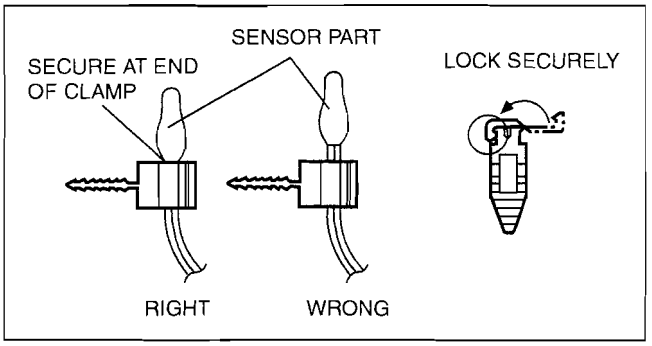
1	Adhesive polyurethane (1)	3	Blower case (2)
2	Blower case (1)	4	Air intake actuator

5	Air intake link set
6	Blower motor
7	Power MOS FET
8	Air mix actuator
9	Air mix link set
10	Airflow mode link set
11	Airflow mode actuator
12	Polyurethane foam (1)
13	Polyurethane foam (2)
14	Adhesive polyurethane (2) (See 07-11-9 Adhesive polyurethane (2).)
15	Adhesive polyurethane (3) (See 07-11-9 Adhesive polyurethane (3).)
16	Adhesive polyurethane (4) (See 07-11-9 Adhesive polyurethane (4).)
17	Evaporator pipe
18	Expansion valve
19	Heater core
20	Air filter
21	A/C case (3)
22	A/C case (1)
23	A/C case (2)
24	Bolt
25	Evaporator temperature sensor (See 07-11-8 Evaporator Temperature Sensor Assembly Note.)
26	Sensor clamp (See 07-11-8 Sensor Clamp Assembly Note.)
27	Evaporator

2. Assemble in the reverse order of disassembly.

Sensor Clamp Assembly Note

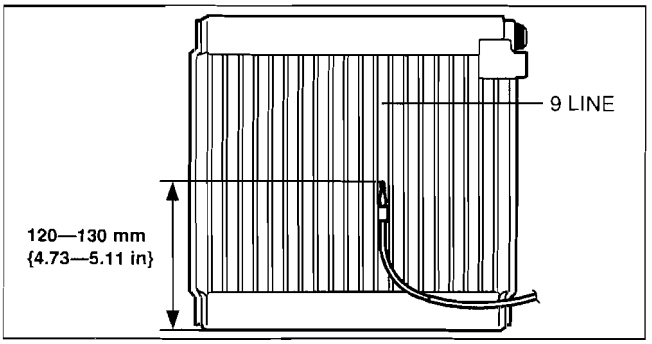
1. Attach the sensor clamp as shown in the figure.



am3zzw0000068

Evaporator Temperature Sensor Assembly Note

1. Assemble the evaporator temperature sensor as shown in the figure.

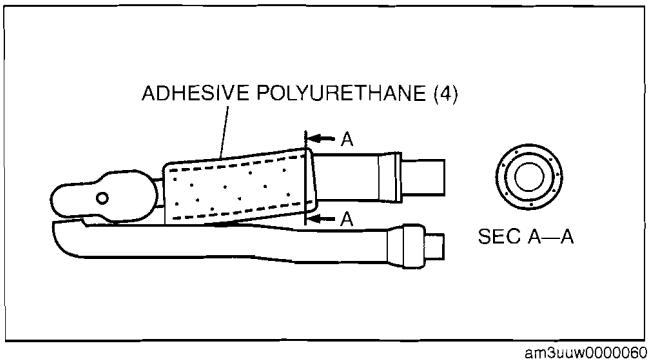


am3zzw0000143

Adhesive Polyurethane Assembly Note

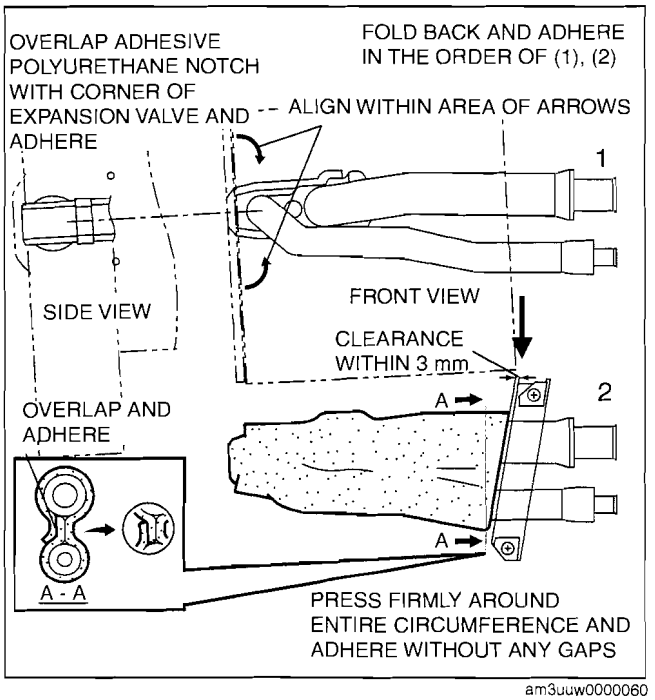
1. Assemble the adhesive polyurethane as shown in the figure.

Adhesive polyurethane (4)



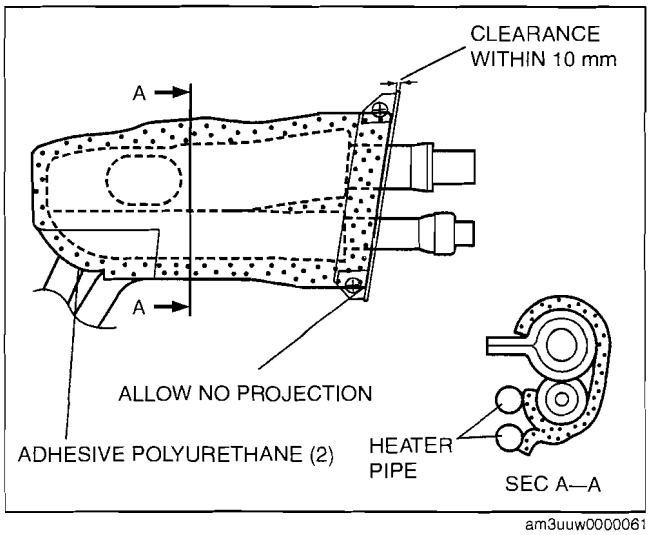
am3uuw0000060

Adhesive polyurethane (3)



am3uuw0000060

Adhesive polyurethane (2)



am3uuw0000061

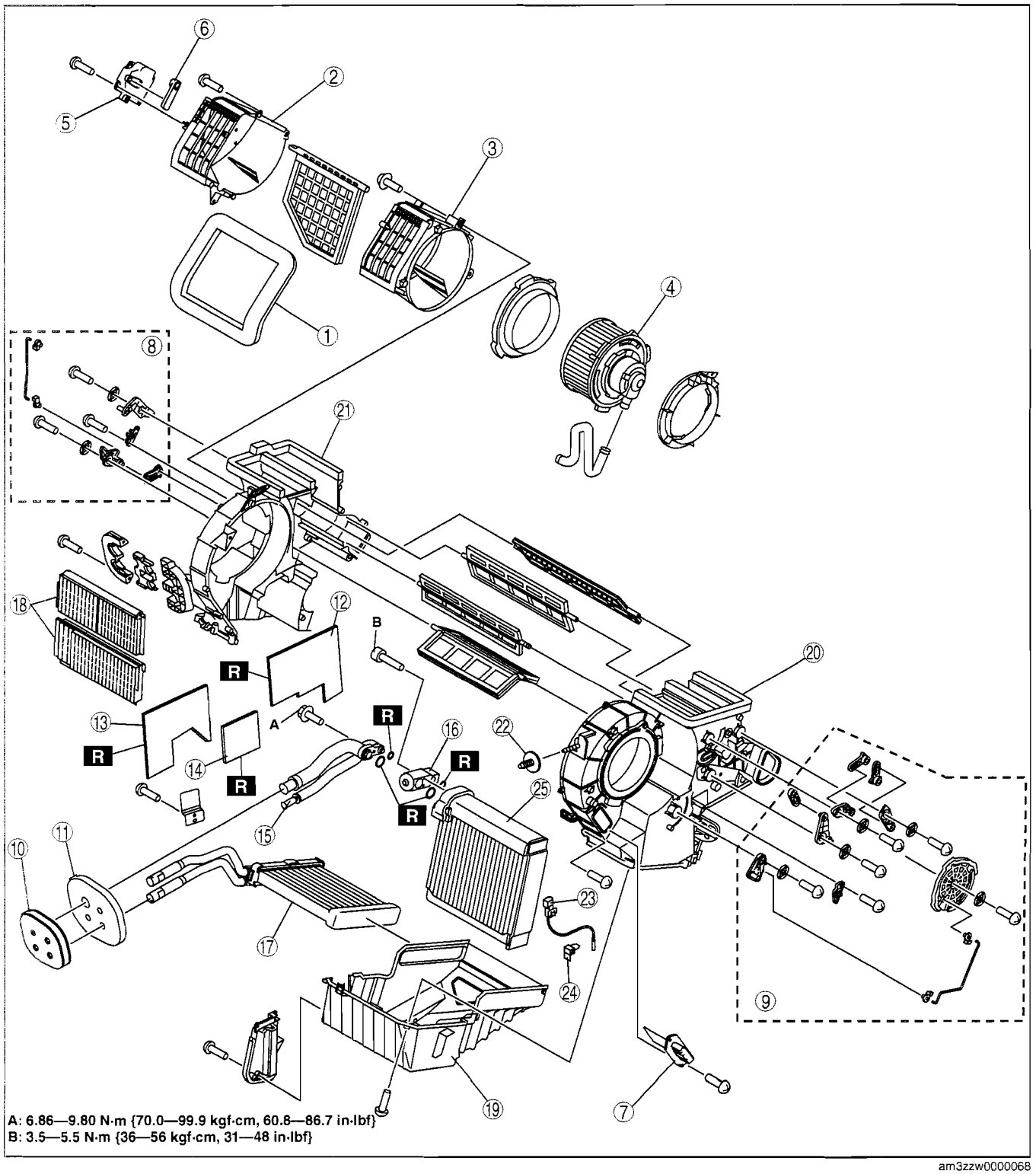
A/C UNIT DISASSEMBLY/ASSEMBLY[MANUAL AIR CONDITIONER]

id0711008003a2

1. Disassemble in the order indicated in the table.

Caution

- **If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.**



am3zzw0000068

1	Adhesive polyurethane (1)	3	Blower case (2)
2	Blower case (1)	4	Blower motor

5	Air intake actuator
6	Air intake link set
7	Resistor
8	Air mix link set
9	Airflow mode link set
10	Polyurethane foam (1)
11	Polyurethane foam (2)
12	Adhesive polyurethane (2) (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].)
13	Adhesive polyurethane (3) (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].)
14	Adhesive polyurethane (4) (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].)
15	Evaporator pipe
16	Expansion valve
17	Heater core
18	Air filter (vehicle with air filter)
19	A/C case (3)
20	A/C case (1)
21	A/C case (2)
22	Bolt
23	Evaporator temperature sensor (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].)
24	Sensor clamp (See 07-11-7 A/C UNIT DISASSEMBLY/ ASSEMBLY[FULL-AUTO AIR CONDITIONER].)
25	Evaporator

2. Assemble in the reverse order of disassembly.

EXPANSION VALVE REMOVAL/INSTALLATION

id071100800400

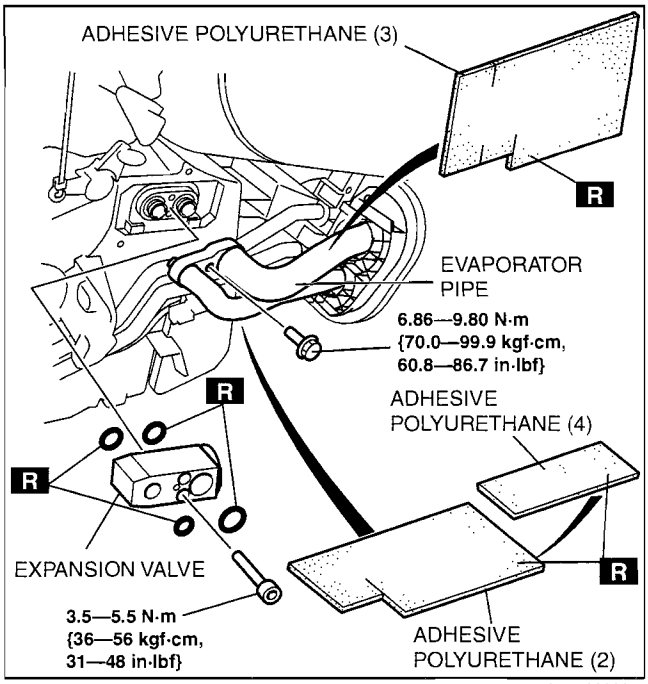
1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-2 REFRIGERANT CHARGING.)

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

3. Disconnect the cooler hose (LO) and cooler pipe. Do not allow compressor oil to spill. (See 07-11-21 REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3].)
4. Remove the following parts:
   (1) Front side trim (RH) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (5) PJB and PJB bracket (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
   (6) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
   (7) Auto leveling control module
5. Remove the blower case.

6. Remove the expansion valve. Do not allow compressor oil to spill.
7. Install in the reverse order of removal.
8. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



am3uuw0000061

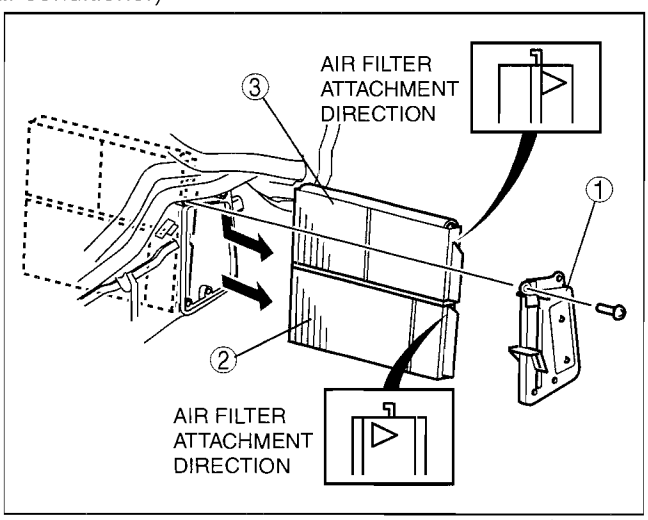
CABIN AIR FILTER REMOVAL/INSTALLATION

id071100806700

1. Disconnect the negative battery cable.
2. Remove the PJB and PJB bracket. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
3. Remove the side wall. (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
4. Disconnect the evaporator temperature sensor connector.
5. Disconnect the power MOS FET connector. (Full-auto air conditioner)
6. Remove in the order indicated in the table.

1	Cabin air filter cover
2	Cabin air filter (1)
3	Cabin air filter (2)

7. Install in the reverse order of removal.



am3zzw0000066

CABIN AIR FILTER INSPECTION

id071100806800

1. Verify that there is no damage, excessive dirt, or abnormal odor on the cabin air filter.
   - If there is any malfunction, replace the cabin air filter.

Note

- The cabin air filter cannot be reused by cleaning it with water or compressed air.

EVAPORATOR INSPECTION

id071100801500

1. Inspect the evaporator for damage, cracks, and oil leakage.
   - If there is any malfunction, replace the evaporator.
2. Visually inspect the fins for bending.
   - If there is any bending, use the end of a flathead screwdriver to straighten the fins.

HEATER CORE INSPECTION

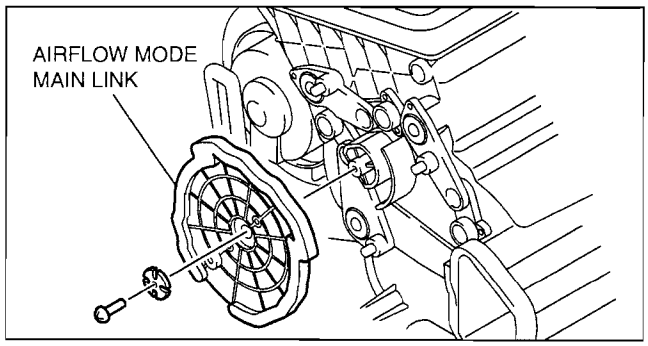
id071100801600

1. Inspect the heater core for damage, cracks, and water leakage.
   - If there is any malfunction, replace the heater core.
2. Visually inspect the fins for bending.
   - If there is any bending, use the end of a flathead screwdriver to straighten the fins.
3. Visually inspect the heater hose for deformation.
   - Repair with pliers if there is deformation. If there is any malfunction, replace the heater core.

AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION

id071100801800

1. Disconnect the negative battery cable.
2. Detach the hood release lever from the lower panel. (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
3. Remove the front scuff plate (LH). (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the front side trim (LH). (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
5. Remove the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
6. Remove the shower duct (LH).
7. Remove the airflow mode actuator. (full-auto air conditioner) (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION.)
8. Disconnect the airflow mode wire. (manual air conditioner) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].)
9. Remove the airflow mode rod.
10. Remove the airflow mode main link.
11. Install in the reverse order of removal.
12. Adjust the airflow mode wire. (manual air conditioner) (See 07-40-33 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.)



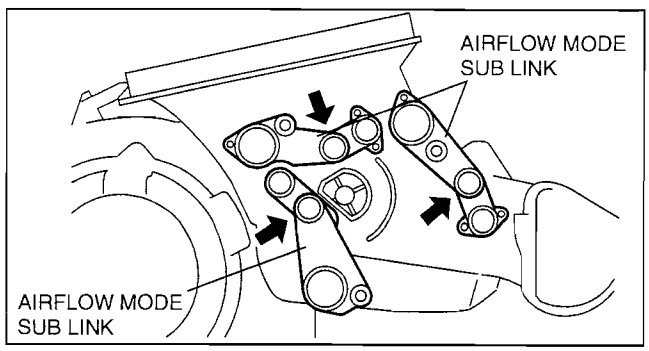
am3uuw0000062

Airflow Mode Main Link Installation Note

Caution

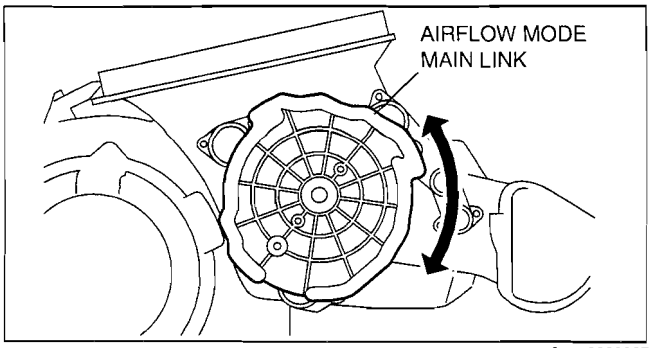
- **Apply only the specified grease to links. Otherwise abnormal noise or improper operation may result.**

1. Push and hold each airflow mode sub link in the direction of the arrow.
2. Set the airflow mode main link to the A/C unit as shown in the figure.
3. Press the airflow mode main link lightly to the A/C unit it in the direction shown by the arrow, then set the projections of each airflow mode sub link into the grooves of the airflow mode main link.



am3zzw0000067

4. Rotate airflow mode main link and verify that each mode is accessed properly.



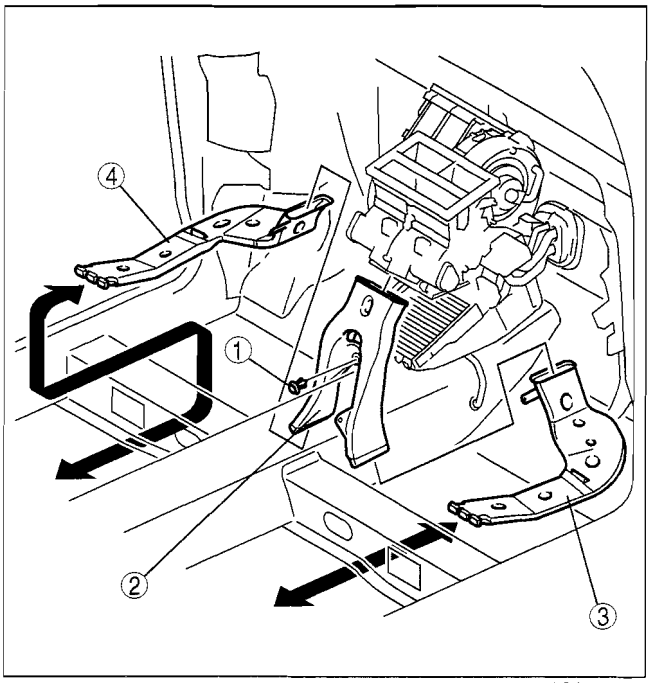
am3zzw0000067

REAR HEAT DUCT REMOVAL/INSTALLATION

id071100800900

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front seat (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
   (2) Audio amplifier (Bose) (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.)
   (3) Woofer (Bose) (See 09-20-10 WOOFER REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (6) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (7) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (8) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (9) Lower anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (10)Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (11)Fuel-filler lid opener lever cover (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
   (12)Floor covering (See 09-17-26 FLOOR COVERING REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Fastener
2	Rear heat duct (1)
3	Rear heat duct (2)
4	Rear heat duct (3)



b3j0711w027

4. Install in the reverse order of removal.

A/C COMPRESSOR REMOVAL/INSTALLATION[LF, L3]

id0711008010c2

1. Disconnect the negative battery cable.
2. Discharge the refrigerant. (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the splash shield.
4. Remove the A/C drive belt. (See 01-10A-4 DRIVE BELT REPLACEMENT[LF, L3].) (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)
5. Detach the two wiring harness clamps.
6. Disconnect the magnetic clutch connector.
7. Remove the A/C compressor protector.
8. Disconnect the cooler hose (LO) and cooler hose (HI). Do not allow remaining compressor oil in the refrigerant line to spill. (See 07-11-21 REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3].)

Caution

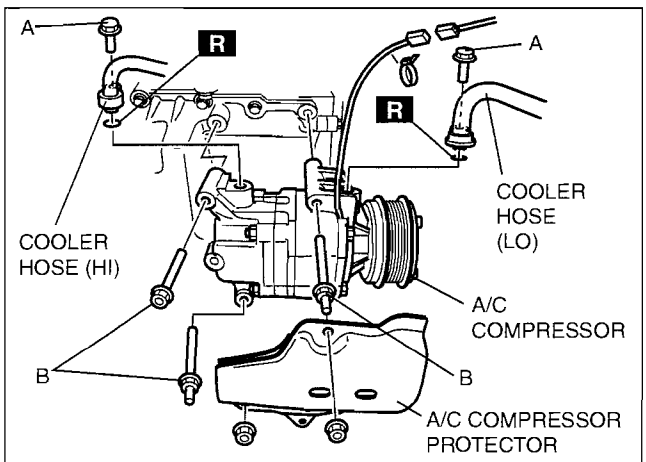
- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**

9. Remove the compressor protector.
10. Remove in the order indicated in the table. Do not allow remaining compressor oil in the A/C compressor to spill.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**

11. Install in the reverse order of removal.
12. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



A: 6.86—9.80 N·m {70.0—99.9 kgf·cm, 60.8—86.7 in·lbf}
B: 17.6—26.5 N·m {1.80—2.70 kgf·m, 13.0—19.5 ft·lbf}

b3a0711w011

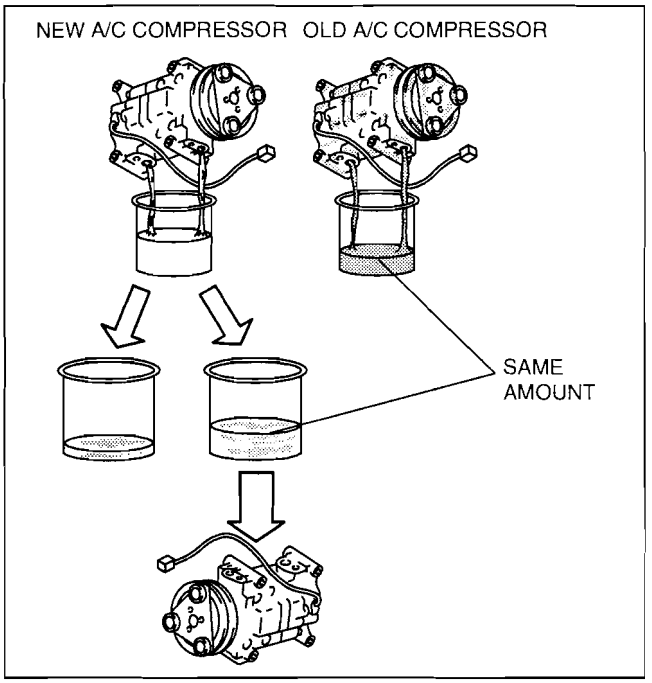
A/C Compressor Installation Note

Caution
- **Due to the high moisture-absorption characteristics of the compressor oil, it may absorb moisture if left over a long period of time thereby negatively affecting A/C operation. Drain the compressor oil and refill within 10 min. of each other.**

1. Rotate new A/C compressor shaft six to eight revolutions while collecting refrigerant oil in a clean measuring device. Use this refrigerant oil to refill new compressor. Do not allow refrigerant oil to become contaminated.
2. Rotate old A/C compressor shaft six to eight revolutions while collecting refrigerant oil in a separate, clean measuring device.
3. Compare those oil amounts. The amount of the oil drained from the new A/C compressor should be greater than the old one.
4. Pour the same amount oil of drained from the old A/C compressor back into the new A/C compressor.

A/C compressor oil type
- **ATMOS GU10**

A/C compressor oil sealed volume (approx. quantity)
- **150 ml {150 cc, 5.07 fl oz}**



am3uuw0000061

A/C COMPRESSOR REMOVAL/INSTALLATION[L3 WITH TC]

id071100801039

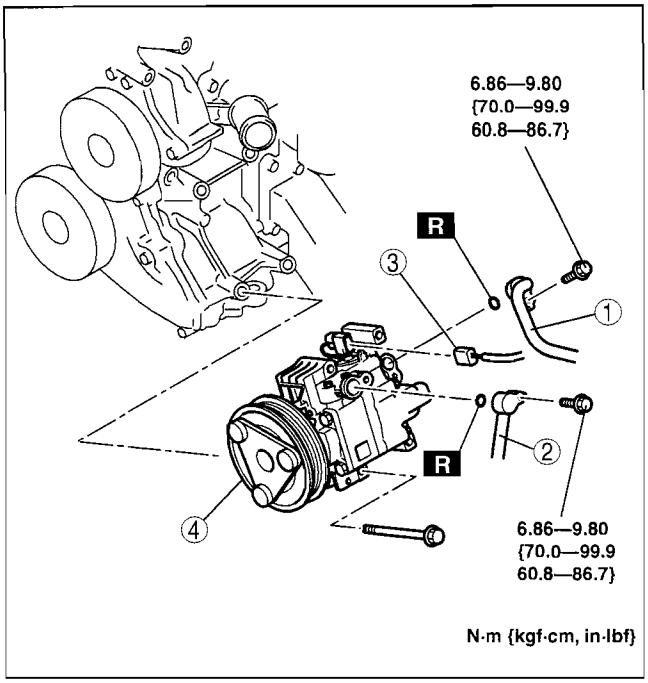
1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the right side splash shield and mudguard.
4. Loosen the drive belt and remove it. (See 01-10B-3 DRIVE BELT REMOVAL/INSTALLATION[L3 WITH TC].)

Caution
- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

5. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)
2	Cooler hose (LO) (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)
3	Magnetic clutch connector
4	A/C compressor (See 07-11-17 A/C Compressor Installation Note.)

6. Install in the reverse order of removal.
7. Adjust the drive belt.
8. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



am3uuw0000061

07-11

A/C Compressor Installation Note

Caution

- **Due to the high moisture-absorption characteristics of the compressor oil, it may absorb moisture if left over a long period of time thereby negatively affecting A/C operation. Drain the compressor oil and refill within 10 min. of each other.**

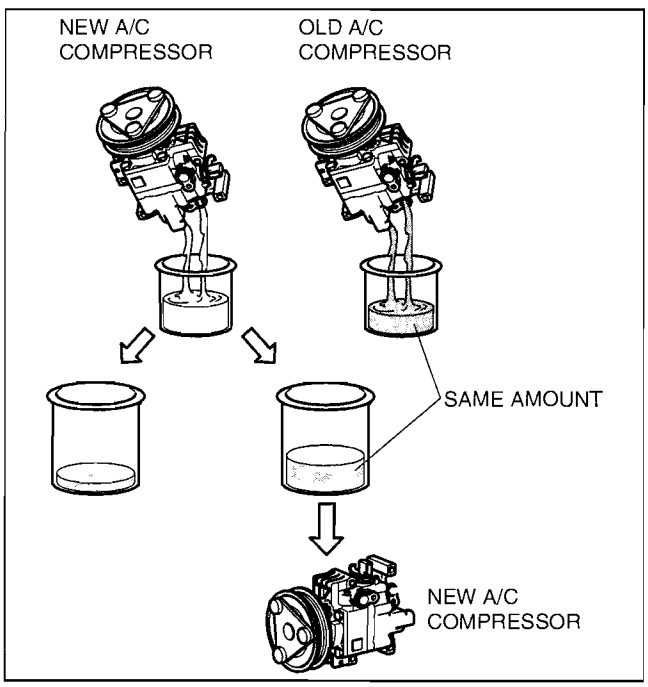
1. Rotate new A/C compressor shaft six to eight revolutions while collecting refrigerant oil in a clean measuring device. Use this refrigerant oil to refill new compressor. Do not allow refrigerant oil to become contaminated.
2. Rotate old A/C compressor shaft six to eight revolutions while collecting refrigerant oil in a separate, clean measuring device.
3. Compare those oil amounts. The amount of the oil drained from the new A/C compressor should be greater than the old one.
4. Pour the same amount oil of drained from the old A/C compressor back into the new A/C compressor.

A/C compressor oil type

- **ATMOS GU10**

A/C compressor oil sealed volume (approx. quantity)

- **150 ml {150 cc, 5.07 fl oz}**



am3uuw0000061

CONDENSER REMOVAL/INSTALLATION

id071100801200

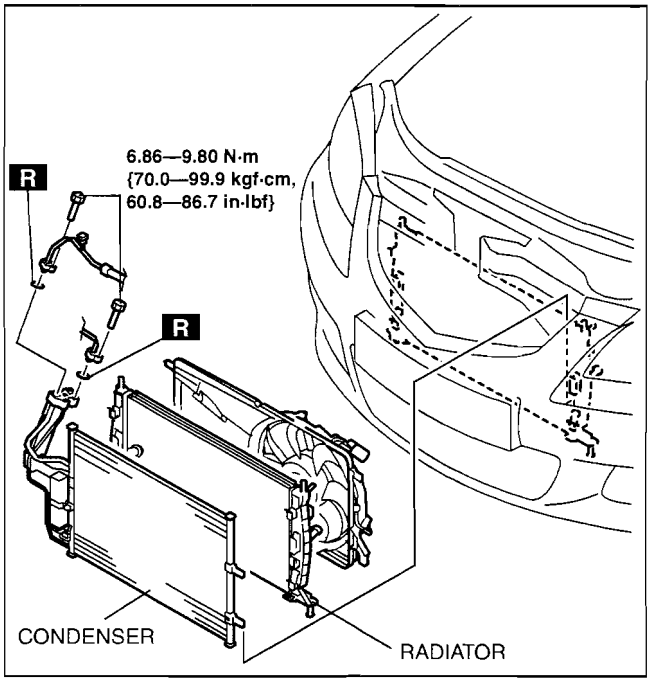
1. Disconnect the negative battery cable.
2. Discharge the refrigerant. (See 07-10-2 REFRIGERANT CHARGING.)
3. Drain the engine coolant. (See 01-12A-3 ENGINE COOLANT REPLACEMENT[LF, L3].) (See 01-12B-4 ENGINE COOLANT REPLACEMENT[L3 WITH TC].)
4. Remove the air cleaner. (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].) (See 01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the splash shield.
6. Disconnect the cooler hose (HI) and cooler pipe. Do not allow remaining compressor oil in the refrigerant line to spill. (See 07-11-21 REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3].)

Caution
- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**

7. Disconnect the radiator hose from the radiator.
8. Remove the cooling fan.
9. Remove the radiator with the condenser installed. (See 01-12A-6 RADIATOR REMOVAL/INSTALLATION[LF, L3].) (See 01-12B-7 RADIATOR REMOVAL/INSTALLATION[L3 WITH TC].)
10. Release the radiator hook and pull the condenser up, being careful not to allow remaining compressor oil in the condenser to spill. (See 07-11-18 Condenser Installation Note.)

Caution
- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.**

11. Install in the reverse order of removal.
12. Inspect for engine coolant leakage. (See 01-12A-4 ENGINE COOLANT LEAKAGE INSPECTION[LF, L3].) (See 01-12B-6 ENGINE COOLANT LEAKAGE INSPECTION[L3 WITH TC].)
13. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



am3uuw0000062

Condenser Installation Note

1. After replacing the condenser, add compressor oil to the refrigeration cycle.

Supplemental oil amount (approx. quantity)
20 ml {20 cc, 0.7 fl oz}

CONDENSER INSPECTION

id071100801300

1. Inspect the condenser for cracks, damage, and oil leakage.
   - If there is any malfunction, replace the condenser.
2. Visually inspect the fins for clogging of foreign material.
   - If any fins are clogged, remove the foreign material.
3. Visually inspect the fins for bending.
   - If there is any bending, use the end of a flathead screwdriver to straighten fins.

RECEIVER/DRIER REMOVAL/INSTALLATION

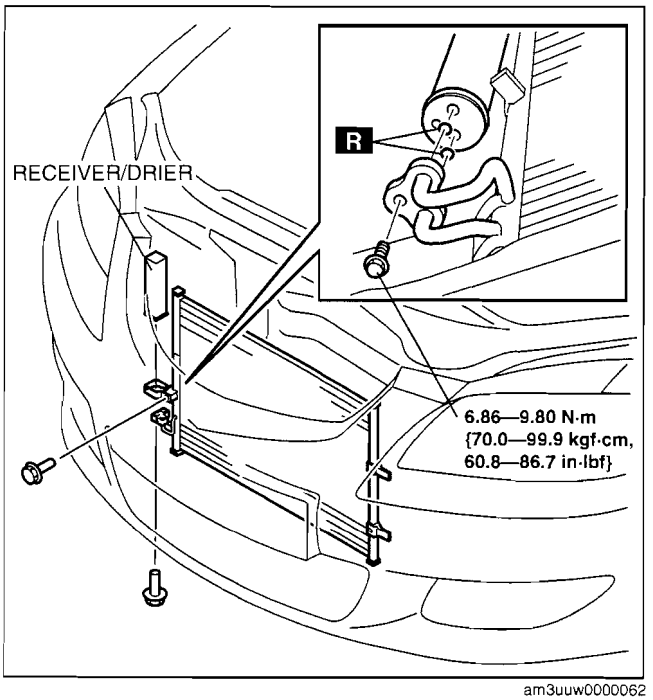
id071100801400

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-6 REFRIGERANT RECOVERY.) (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the under cover.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

4. Remove the receiver/drier. Do not allow compressor oil to spill.
5. Install in the reverse order of removal.
6. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)



am3uuw0000062

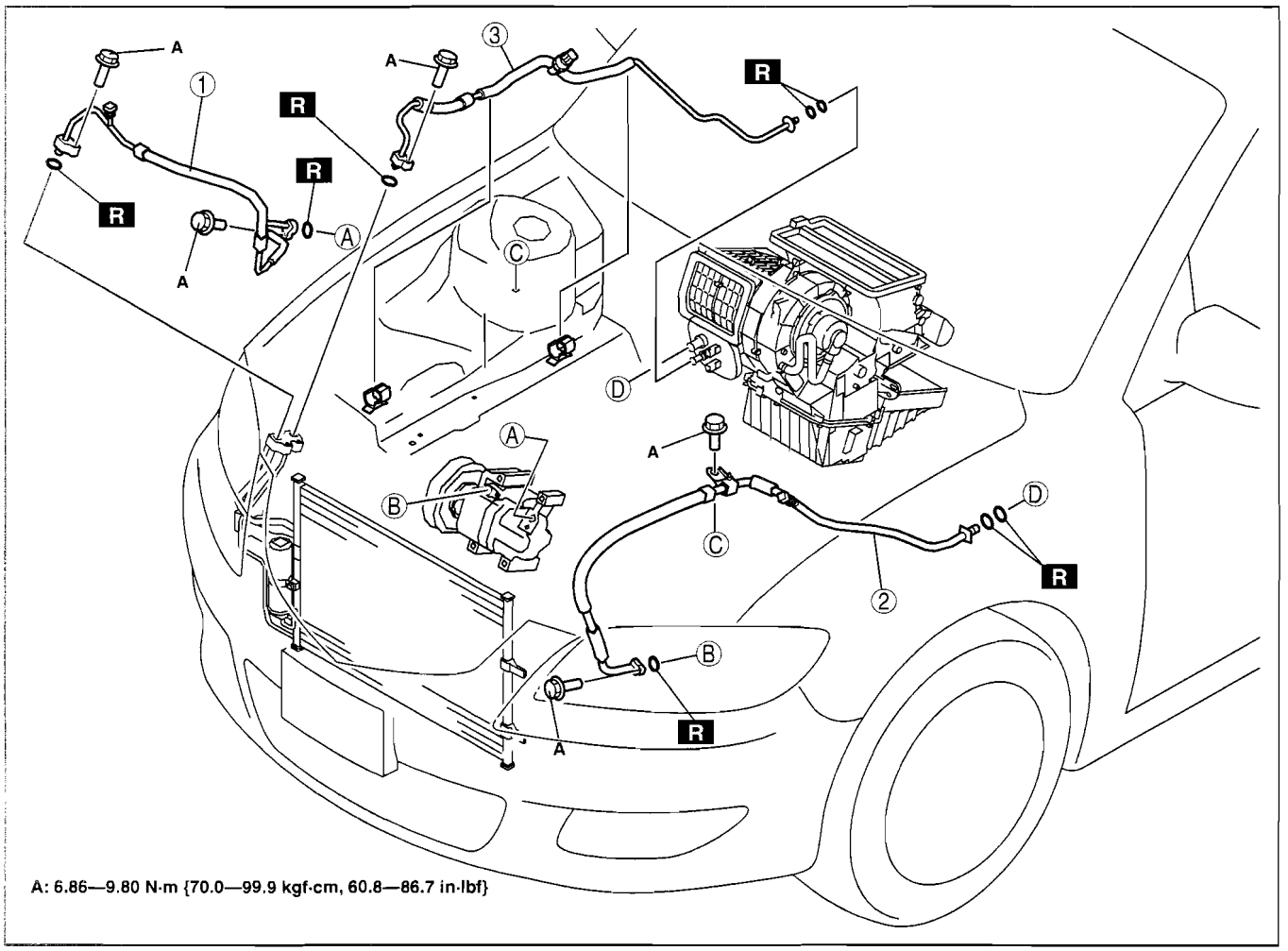
REFRIGERANT LINES REMOVAL/INSTALLATION[L3 WITH TC]

id071100801139

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the P/S fluid reserve tank.
4. Remove the coolant reserve tank. (See 01-12B-7 COOLANT RESERVE TANK REMOVAL/INSTALLATION[L3 WITH TC].)
5. Remove the splash shield.
6. Remove the charge air cooler cover.
7. Remove the insulator.
8. Remove in the order indicated in the table. Do not allow compressor oil to spill.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**



am3uuw0000061

1	Cooler hose (HI) (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)
2	Cooler hose (LO) (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)
3	Cooler pipe (See 07-11-20 REFRIGERANT LINES REMOVAL/ INSTALLATION[L3 WITH TC].)

9. Install in the reverse order of removal.
10. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)

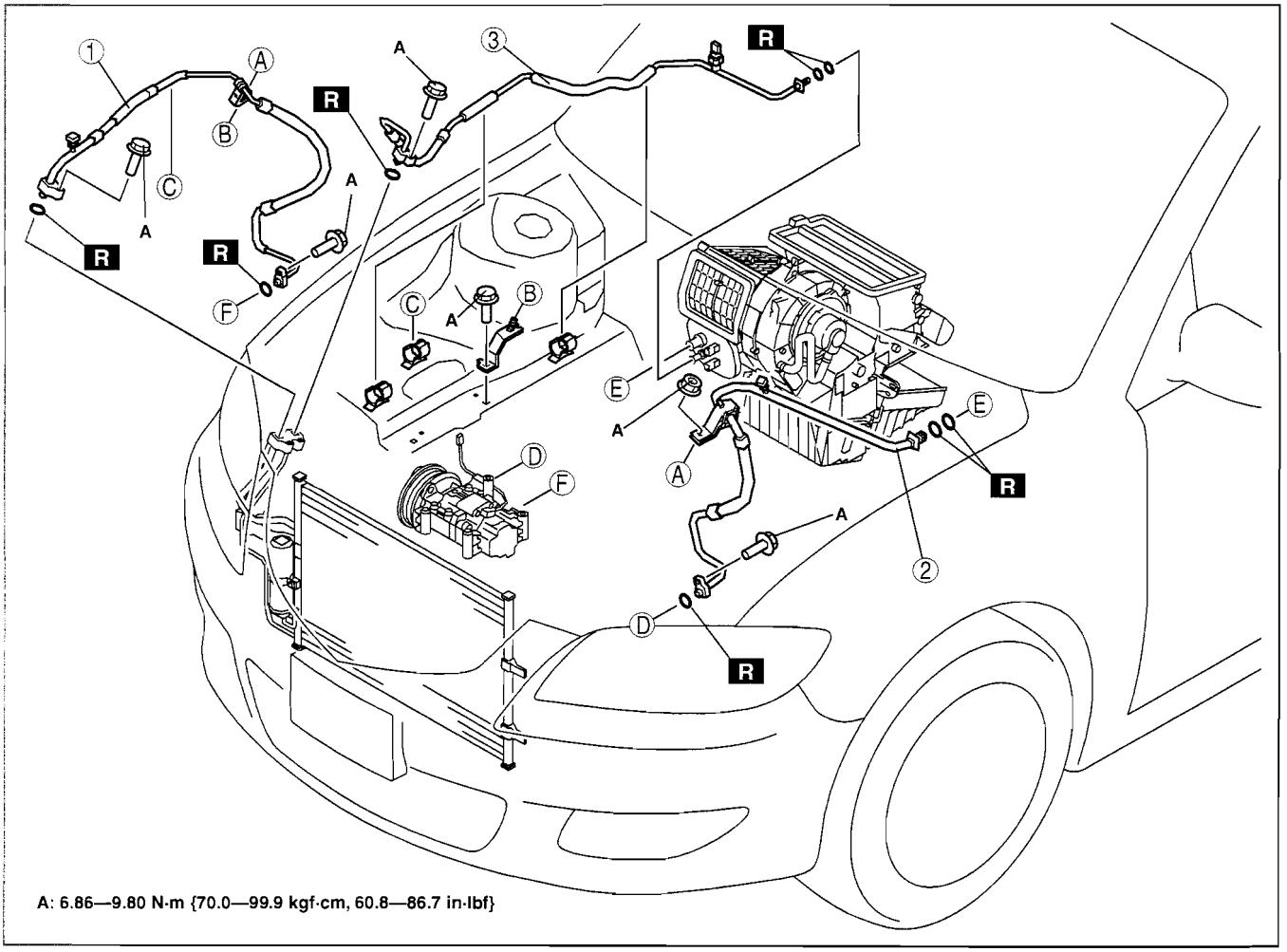
REFRIGERANT LINES REMOVAL/INSTALLATION[LF, L3]

id0711008011c2

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the P/S fluid reserve tank.
4. Remove the coolant reserve tank. (See 01-12A-5 COOLANT RESERVE TANK REMOVAL/INSTALLATION[LF, L3].)
5. Remove the accelerator cable.
6. Remove the P/S fluid hose bracket.
7. Remove the under cover.
8. Remove in the order indicated in the table. Do not allow compressor oil to spill.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**



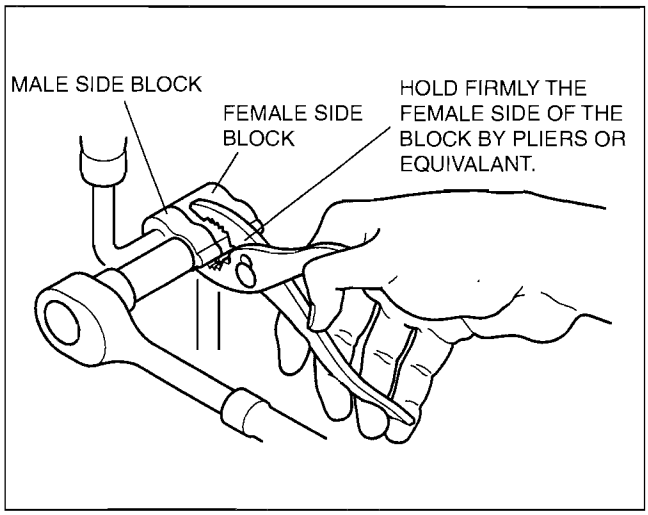
am3uuw0000061

1	Cooler hose (HI) (See 07-11-22 Refrigerant Line Removal Note.) (See 07-11-23 Refrigerant Line Installation Note.)
2	Cooler hose (LO) (See 07-11-22 Refrigerant Line Removal Note.) (See 07-11-23 Refrigerant Line Installation Note.)
3	Cooler pipe (See 07-11-22 Refrigerant Line Removal Note.) (See 07-11-23 Refrigerant Line Installation Note.)

9. Install in the reverse order of removal.
10. Perform the refrigerant system performance test. (See 07-10-7 REFRIGERANT SYSTEM PERFORMANCE TEST.)

Refrigerant Line Removal Note
Block joint type

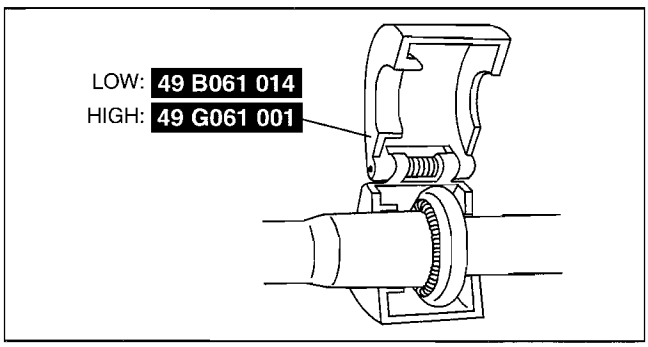
1. Disconnect the block joint type pipes by grasping female side of the block with pliers or similar tool and holding firmly, then remove the connection bolt or nut.



am3uuw0000061

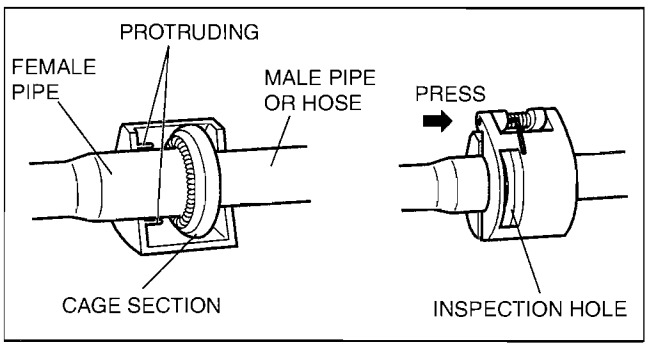
Spring-lock coupling type

1. Set the **SST**.



am3zzw0000072

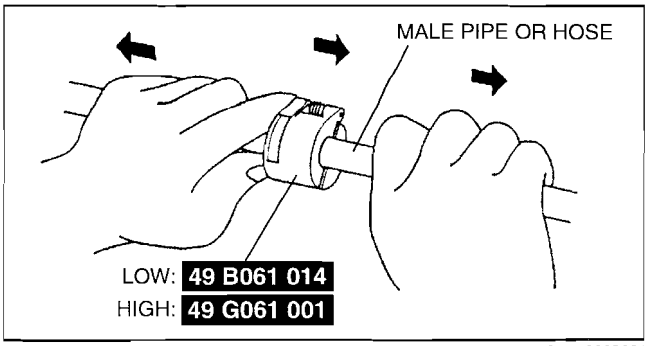
2. While looking through the inspection hole of the **SST**, insert the protruding part of the **SST** until it makes contact with the cage section.



am3zzw0000072

3. Use the **SST** to disconnect the male pipe or hose from the female by pulling the male pipe or hose.

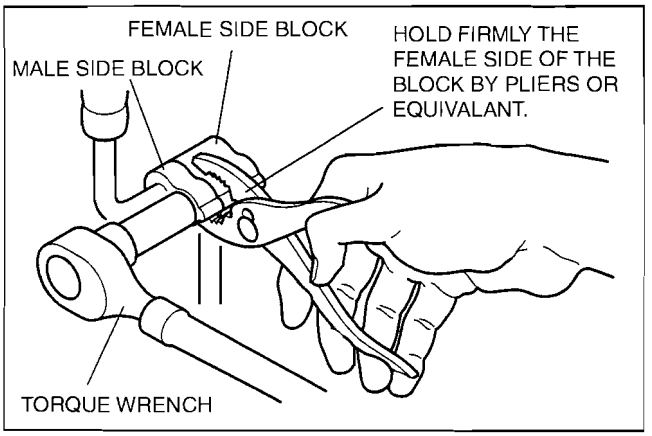
Note
- The male pipe or hose can be disconnected easily from the female pipe by pulling from the male pipe or hose while maintaining the pressure of the protruding part of the **SST**.



am3uuw0000061

Refrigerant Line Installation Note
1. Apply compressor oil to the O-rings and connect the joints.
2. Tighten the joints.

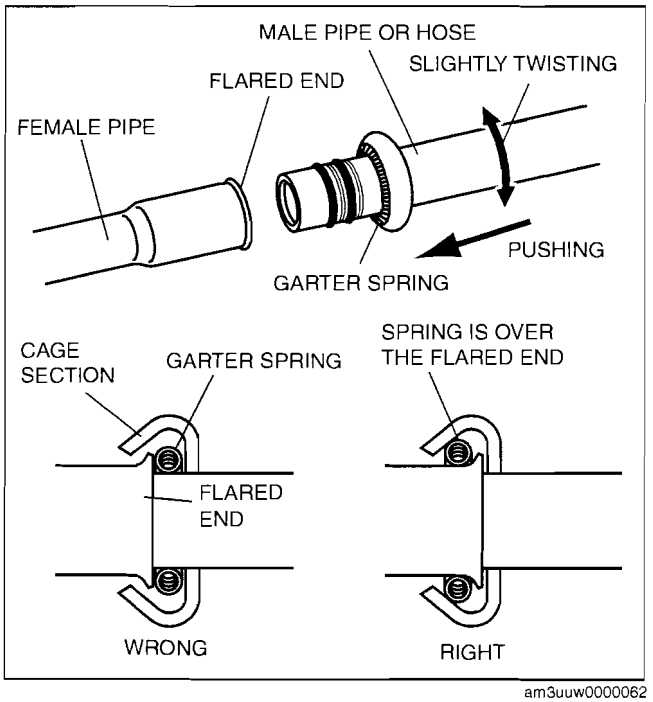
Block joint type
1. Tighten the bolt of joint by hand.
2. Connect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, then tighten the connection bolt or nut with a torque wrench.



am3uuw0000061

Spring-lock coupling type
1. Connect the male pipe or hose by twisting it onto female pipe until the garter spring at the male pipe or hose is over the flared end of female pipe.

Note
- When the male pipe or hose is replaced, the indicator ring comes out after connecting to indicate that it is locked.

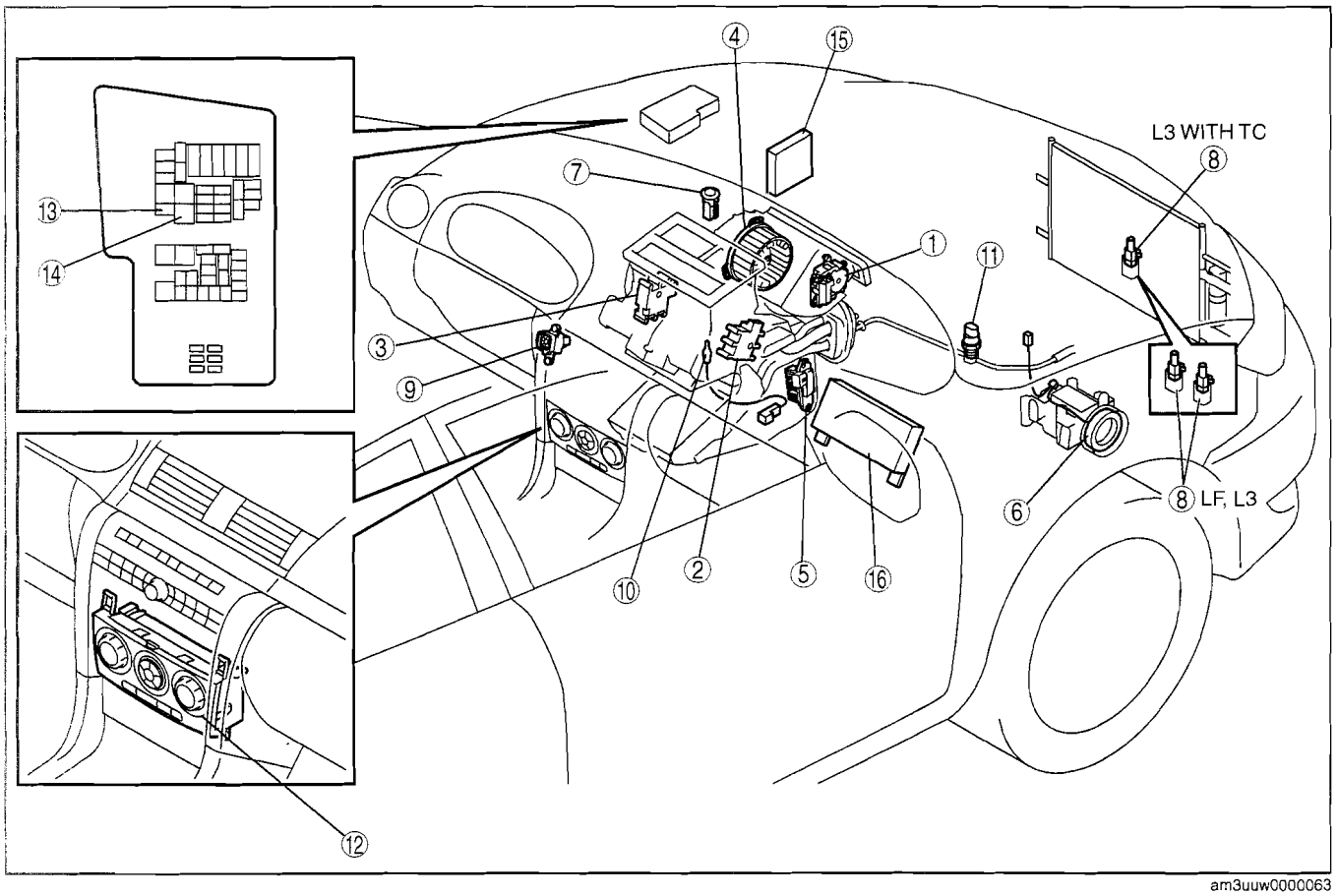


am3uuw0000062

07-40 CONTROL SYSTEM

HVAC CONTROL SYSTEM LOCATION INDEX[FULL-AUTO AIR CONDITIONER]

id0740008036a1



am3uuw0000063

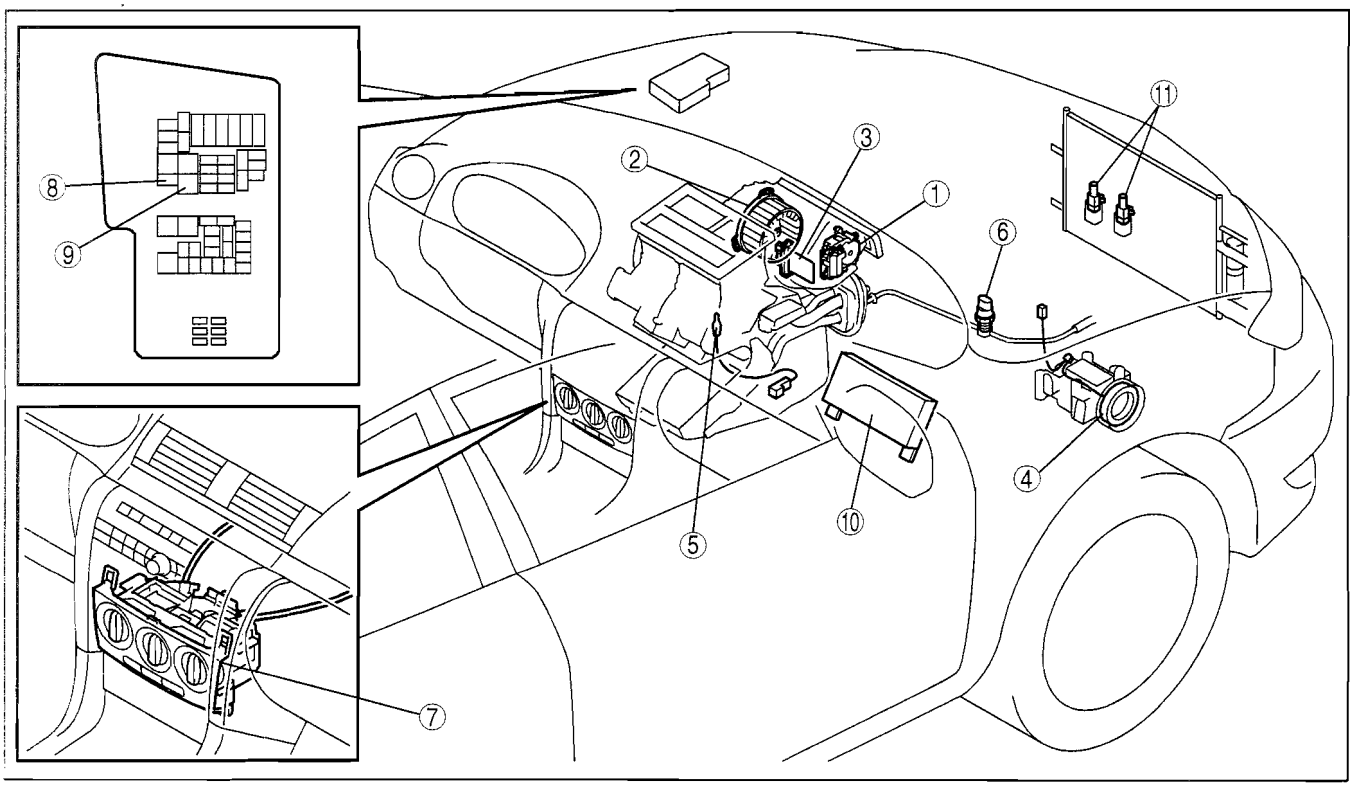
1	Air intake actuator (See 07-40-4 AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.) (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.)
2	Air mix actuator (See 07-40-6 AIR MIX ACTUATOR REMOVAL/INSTALLATION.) (See 07-40-8 AIR MIX ACTUATOR INSPECTION.)
3	Airflow mode actuator (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION.) (See 07-40-9 AIRFLOW MODE ACTUATOR INSPECTION.)
4	Blower motor (See 07-40-10 BLOWER MOTOR REMOVAL.) (See 07-40-14 BLOWER MOTOR INSTALLATION.) (See 07-40-17 BLOWER MOTOR INSPECTION.)
5	Power MOS FET (See 07-40-17 POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/INSTALLATION.) (See 07-40-18 POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) INSPECTION.)
6	Magnetic clutch (See 07-40-19 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[LF, L3].) (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].) (See 07-40-21 MAGNETIC CLUTCH ADJUSTMENT.) (See 07-40-22 MAGNETIC CLUTCH INSPECTION[LF, L3].) (See 07-40-22 MAGNETIC CLUTCH INSPECTION[L3 WITH TC].)
7	Solar radiation sensor (See 07-40-23 SOLAR RADIATION SENSOR REMOVAL/INSTALLATION.) (See 07-40-23 SOLAR RADIATION SENSOR INSPECTION.)
8	Ambient temperature sensor (See 07-40-24 AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION.) (See 07-40-24 AMBIENT TEMPERATURE SENSOR INSPECTION.)
9	Passenger compartment temperature sensor (See 07-40-25 PASSENGER COMPARTMENT TEMPERATURE SENSOR REMOVAL/INSTALLATION.) (See 07-40-25 PASSENGER COMPARTMENT TEMPERATURE SENSOR INSPECTION.)
10	Evaporator temperature sensor (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION.) (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR INSPECTION.)

11	Refrigerant pressure switch (See 07-40-27 REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION.) (See 07-40-28 REFRIGERANT PRESSURE SWITCH INSPECTION.)
12	Climate control unit (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/INSTALLATION[FULL-AUTO AIR CONDITIONER].) (See 07-40-32 CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY[FULL-AUTO AIR CONDITIONER].) (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)

13	A/C relay (See 09-21-3 RELAY INSPECTION.)
14	Blower relay (See 09-21-3 RELAY INSPECTION.)
15	PCM (See 01-40A-13 PCM INSPECTION[LF, L3].) (See 01-40B-7 PCM INSPECTION[L3 WITH TC].)
16	PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.) (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.)

HVAC CONTROL SYSTEM LOCATION INDEX[MANUAL AIR CONDITIONER]

id0740008036a2



am3uuw0000063

1	Air intake actuator (See 07-40-4 AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.) (See 07-40-5 AIR INTAKE ACTUATOR INSPECTION.)
2	Blower motor (See 07-40-10 BLOWER MOTOR REMOVAL.) (See 07-40-14 BLOWER MOTOR INSTALLATION.) (See 07-40-17 BLOWER MOTOR INSPECTION.)
3	Resistor (See 07-40-18 RESISTOR REMOVAL/INSTALLATION.) (See 07-40-19 RESISTOR INSPECTION.)

4	Magnetic clutch (See 07-40-19 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[LF, L3].) (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].) (See 07-40-21 MAGNETIC CLUTCH ADJUSTMENT.) (See 07-40-22 MAGNETIC CLUTCH INSPECTION[LF, L3].) (See 07-40-22 MAGNETIC CLUTCH INSPECTION[L3 WITH TC].)
5	Evaporator temperature sensor (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION.) (See 07-40-26 EVAPORATOR TEMPERATURE SENSOR INSPECTION.)

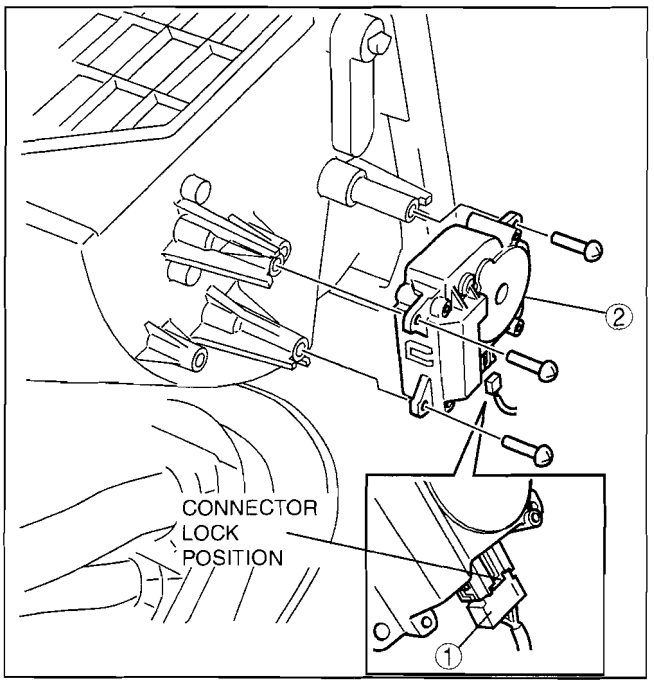
6	Refrigerant pressure switch (See 07-40-27 REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION.) (See 07-40-28 REFRIGERANT PRESSURE SWITCH INSPECTION.)
7	Climate control unit (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].) (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].) (See 07-40-32 CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY[MANUAL AIR CONDITIONER].) (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].)
8	A/C relay (See 09-21-3 RELAY INSPECTION.)
9	Blower relay (See 09-21-3 RELAY INSPECTION.)
10	PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.) (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.)
11	Ambient temperature sensor (See 07-40-24 AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION.) (See 07-40-24 AMBIENT TEMPERATURE SENSOR INSPECTION.)

AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

id074000801400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (5) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
3. Slide the blower case to the position shown in the figure. (L3 with TC)
4. Remove in the order indicated in the table.

LF, L3

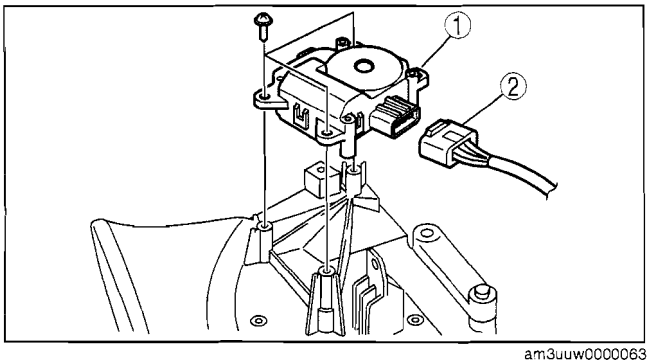


am3uuw0000062

L3 with TC

1	Air intake actuator connector
2	Air intake actuator

5. Install in the reverse order of removal.



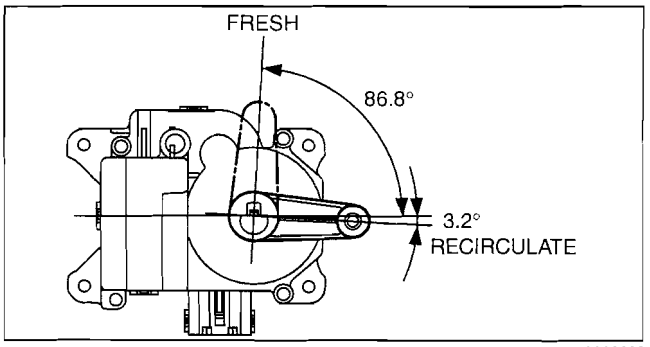
am3uuw0000063

AIR INTAKE ACTUATOR INSPECTION

id074000801500

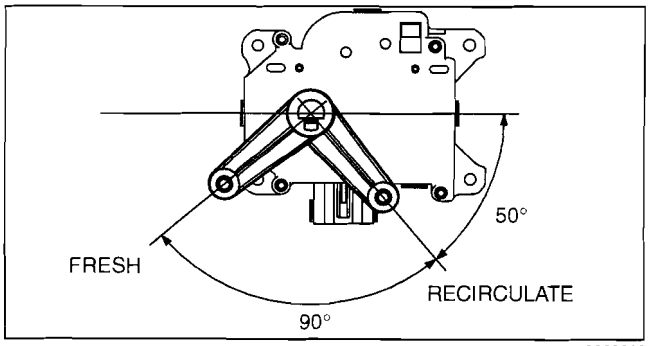
1. Connect battery positive voltage to air intake actuator terminal C (or G), connect terminal G (or E) to ground, and then verify that the air intake actuator operates as shown in the table.
   - If the operation condition is not normal, replace the air intake actuator.

LF, L3



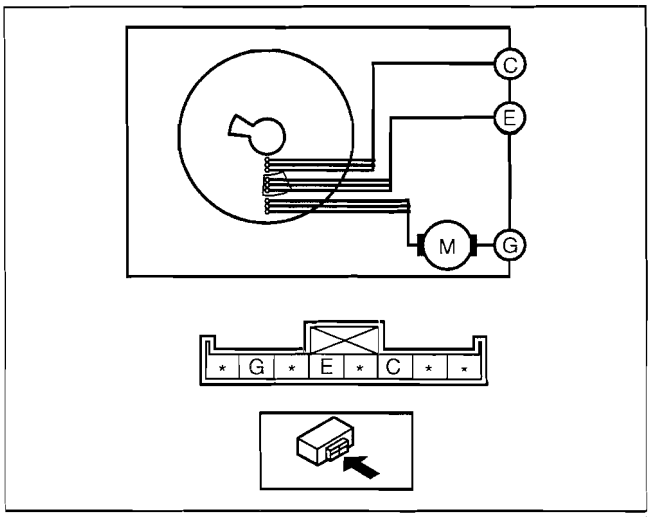
am3uuw0000063

L3 with TC



am3uuw0000063

Terminal			Air intake actuator operation
C	E	G	
B+	–	Ground	FRESH → RECIRCULATE
–	Ground	B+	RECIRCULATE → FRESH



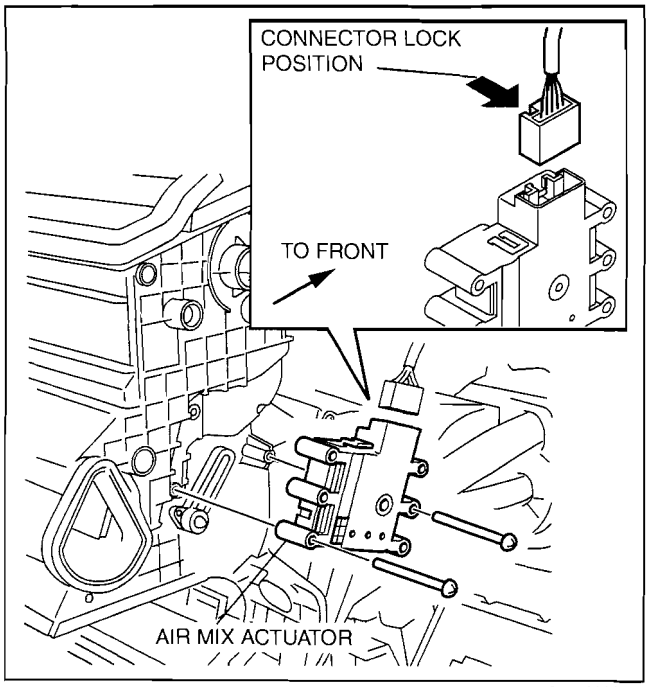
am3uuw0000063

AIR MIX ACTUATOR REMOVAL/INSTALLATION

id074000802400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front doors (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (5) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (6) PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
   (7) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
   (8) Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
   (9) Ashtray panel
   (10)Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (11)Shift lever component (MTX) (See 05-16-1 SHIFT MECHANISM REMOVAL/INSTALLATION[G35M-R]05-16-2 SHIFT MECHANISM REMOVAL/INSTALLATION[A26M-R].)
   (12)Selector lever component (ATX) (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/INSTALLATION.)
   (13)Center panel unit (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.)
   (14)Hood release lever from the lower panel
   (15)Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (16)Shower ducts (LH, RH)
   (17)Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
   (18)Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
   (19)Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
   (20)Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
   (21)Steering shaft (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
   (22)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (23)Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (24)Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
   (25)Cowl panel (See 09-10-20 COWL PANEL REMOVAL/INSTALLATION.)
   (26)Windshield wiper motor (See 09-19-4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.)
3. Disconnect the following connectors:
   — Blower motor connector
   — Power MOS FET connector
   — Evaporator temperature sensor connector
   — Air intake actuator connector
   — Air mix actuator connector
   — Airflow mode actuator connector
4. Remove the rear heat duct (1).
5. Remove the heater case. (See 07-11-3 A/C UNIT REMOVAL/INSTALLATION.)
6. Remove the nuts and bolts for installing the dashboard to the body.
7. Slide the dashboard.

8. Remove in the air mix actuator.
9. Install in the reverse order of removal.



am3zzw0000075

AIR MIX ACTUATOR INSPECTION

id074000802500

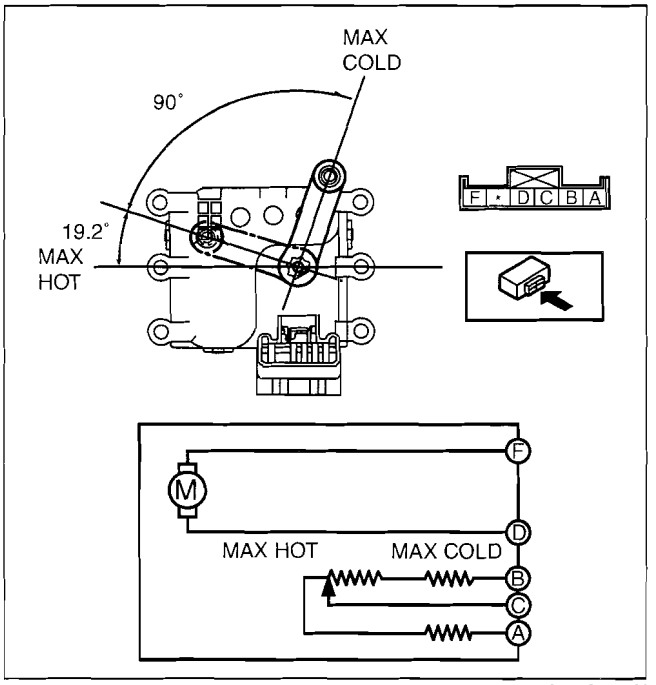
Caution

- **If the lever position exceeds the operation range shown in the figure, the circuit in the actuator could be damaged. Always perform an actuator operation inspection with the lever movement within the range shown in the figure.**

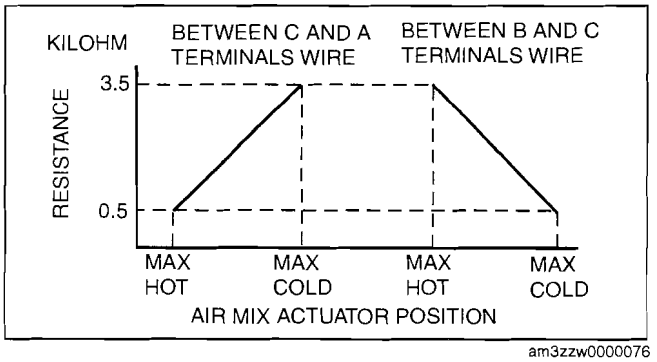
1. Connect battery positive voltage to air mix actuator terminal D (or F), connect terminal F (or D) to ground, and then verify that the air mix actuator operates as shown in the table.
   - If the operation condition is not normal, replace the air mix actuator.

Terminal		Air mix actuator operation
D	F	
B+	Ground	HOT → COLD
Ground	B+	COLD → HOT

2. Verify that the resistance between terminals B and C, C and A matches the air mix actuator operation as shown in the graph.
   - If the operation condition and resistance are not normal, replace the air mix actuator.



am3uuw0000066



am3zzw0000076

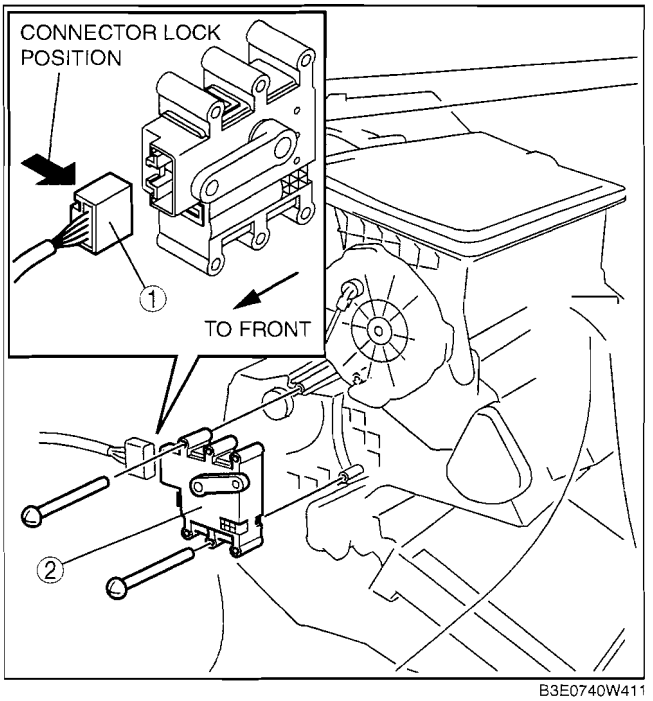
AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION

id074000801600

1. Disconnect the negative battery cable.
2. Remove the airflow mode rod from the airflow mode actuator.
3. Remove in the order indicated in the table.

1	Airflow mode actuator connector
2	Airflow mode actuator

4. Install in the reverse order of removal.



B3E0740W411

AIRFLOW MODE ACTUATOR INSPECTION

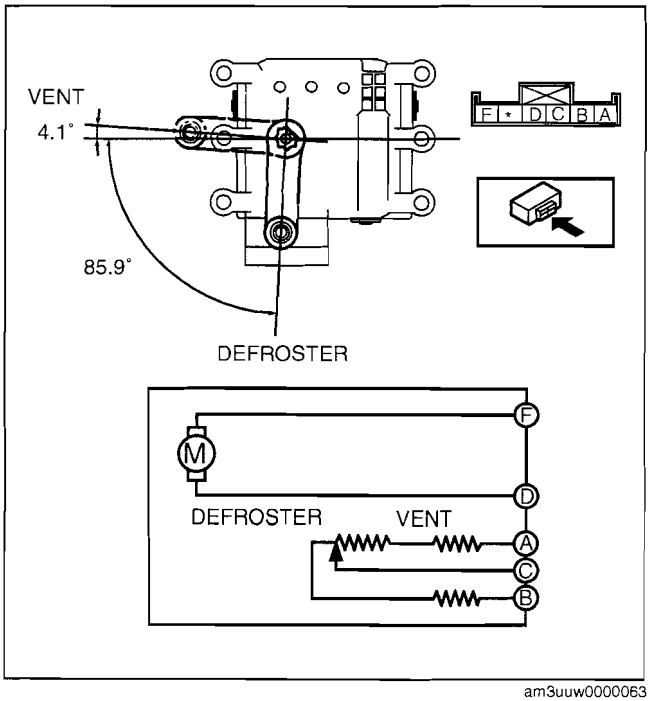
id074000801700

Caution

- **If the lever position exceeds the operation range shown in the figure, the circuit in the actuator could be damaged. Always perform an actuator operation inspection with the lever movement within the range shown in the figure.**

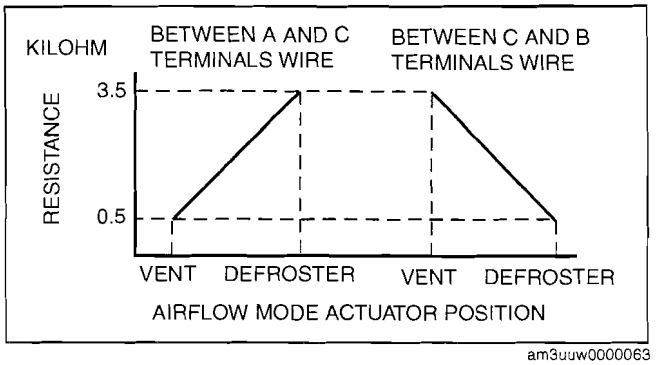
1. Connect battery positive voltage to airflow mode actuator terminal D (or F), connect terminal F (or D) to ground, and then verify that the airflow mode actuator operates as shown in the table.
   - If the operation condition is not normal, replace the airflow mode actuator.

Terminal		Airflow mode actuator operation
D	F	
B+	Ground	VENT → DEFROSTER
Ground	B+	DEFROSTER → VENT



am3uuw0000063

2. Verify that the resistance between terminals A and C, C and B matches the airflow mode actuator operation as shown in the graph.
   - If the operation condition and resistance are not normal, replace the airflow mode actuator.

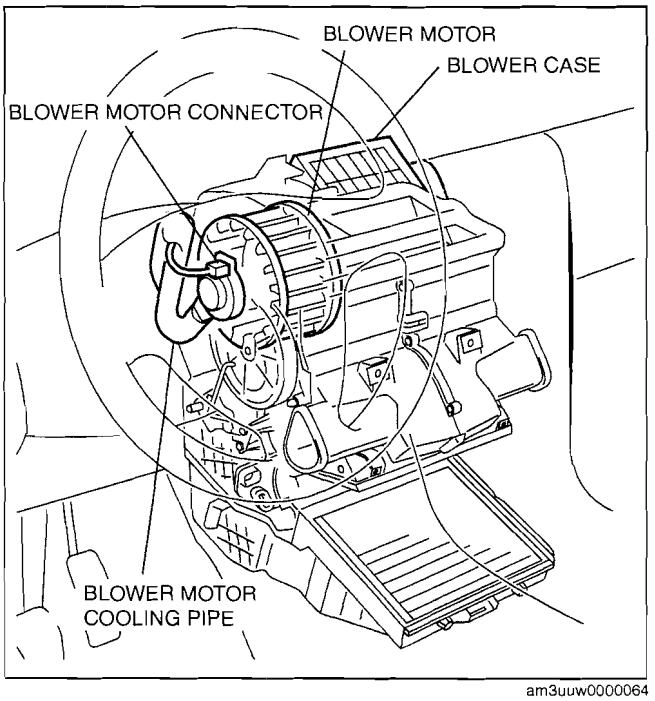


am3uuw0000063

BLOWER MOTOR REMOVAL

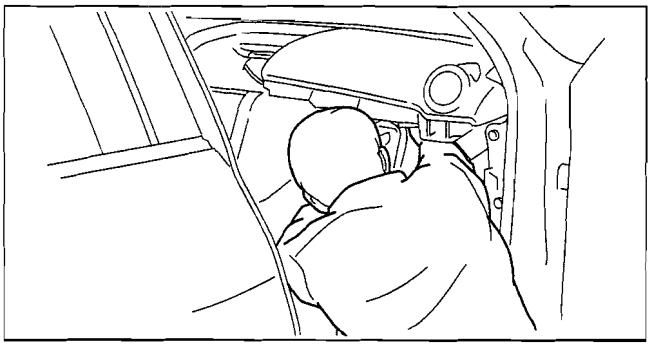
id074000807300

Note
- The blower motor is located on the A/C unit as shown in the figure.



am3uuw0000064

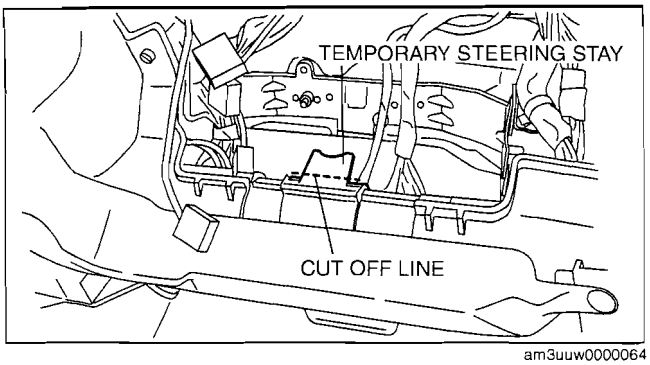
- Perform the work from the front passenger's side in the posture shown in the figure.



am3uuw0000064

1. Set the air intake mode to FRESH.
2. Disconnect the negative battery cable.
3. Remove the following parts:
   (1) Front scuff plate (RH) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (RH) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/ INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (5) PJB and PJB bracket (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
   (6) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
   (7) Auto leveling control module

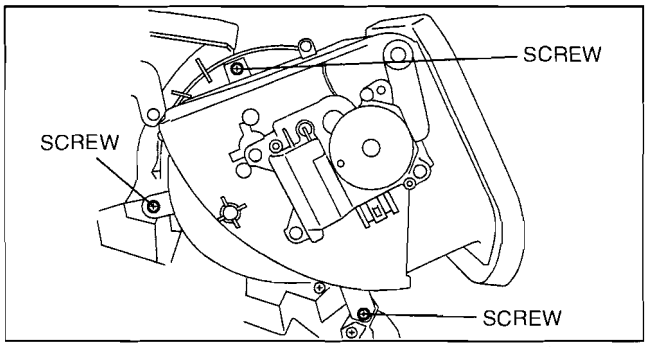
4. Cut off the temporary steering stay on the passenger's side.
5. Detach the hood release lever from the lower panel. (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
6. Remove the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)



am3uuw0000064

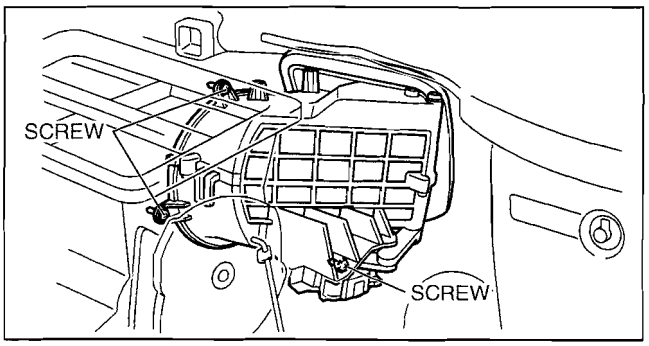
7. Remove the screws shown in the figure and slide the blower case.

LF, L3



am3uuw0000064

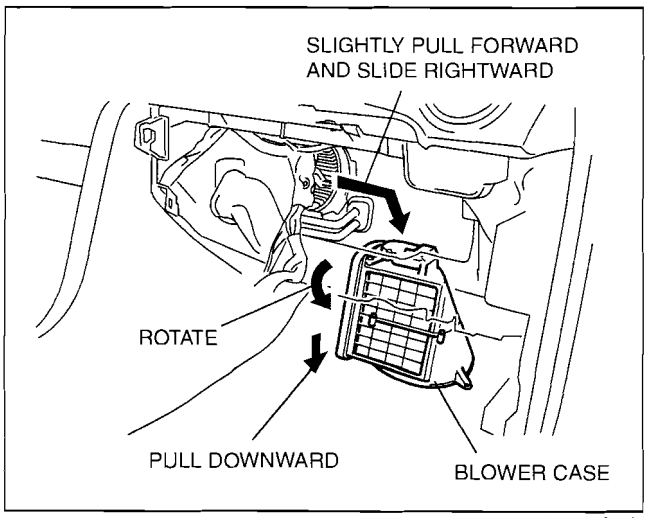
L3 with TC



am3uuw0000064

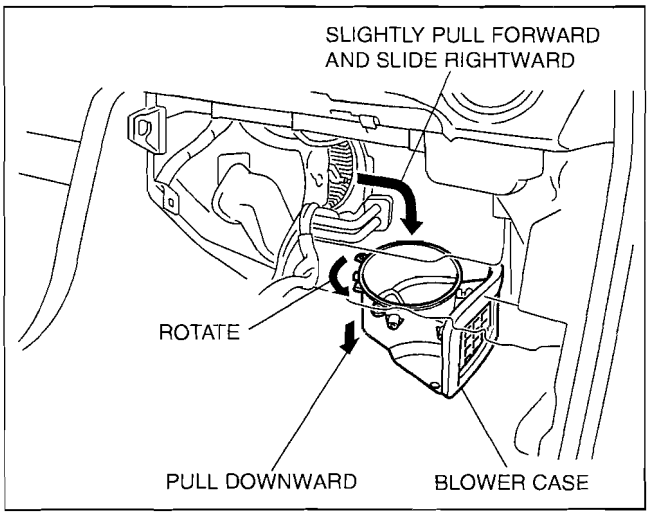
8. Disconnect the air intake actuator connector.
9. Remove the blower case shown in the figure.

LF, L3



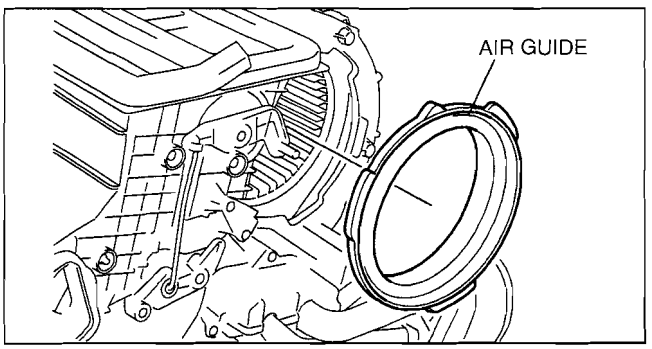
am3uuw0000065

L3 with TC



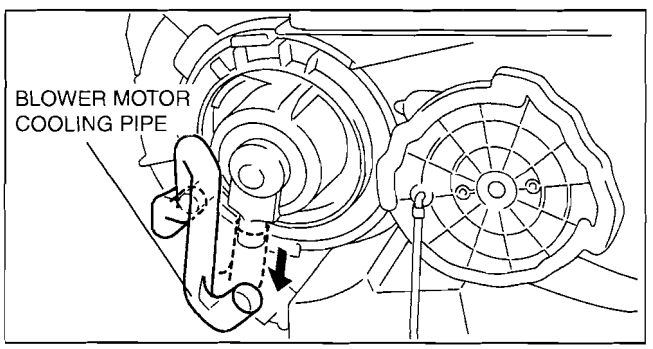
am3uuw0000065

10. Remove the air guide.
11. Install the **SST (49 B061 015)** to the blower motor. (See 07-40-13 SST Installation Note.)
12. Disconnect the resistor connector. (Manual air conditioner)



am3uuw0000065

13. Disconnect the blower motor cooling pipe connected to the blower motor.
14. Remove the airflow mode actuator. (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/ INSTALLATION.)

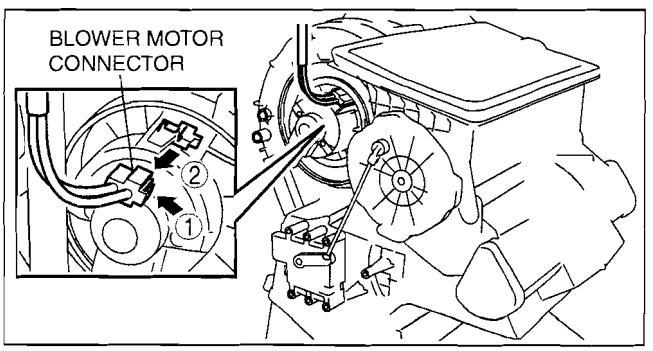


am3uuw0000065

15. Disconnect the blower motor connector as shown in the figure.
16. Remove the blower motor cover. (See 07-40-14 Blower Motor Cover Removal Note.)

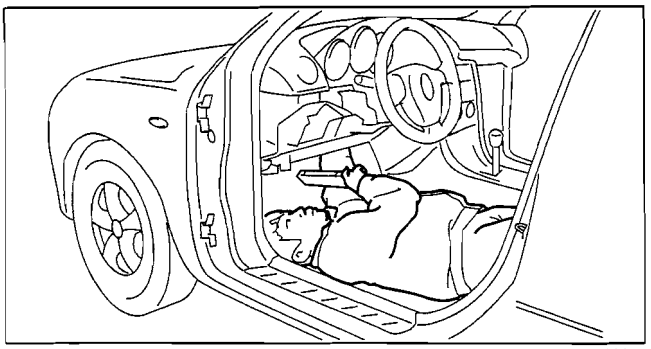
Caution

- **When the blower motor cover is removed, the blower motor could fall in the A/C unit case causing the sirocco fan to be damaged. Therefore another person must hold the blower motor at the installation position.**



am3zzw0000084

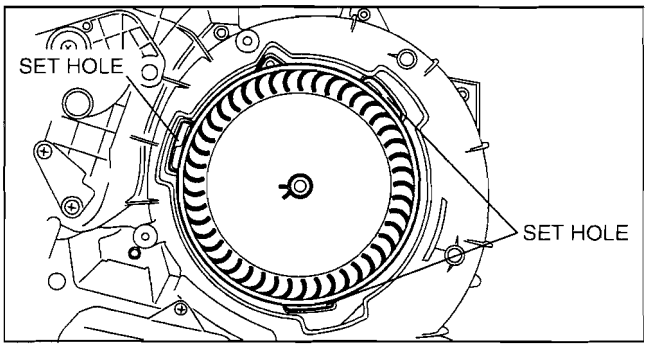
17. Remove the blower motor by pulling it out. (See 07-40-14 Blower Motor Removal Note.)



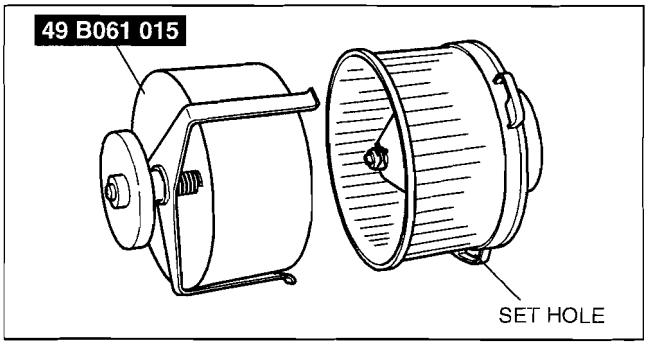
am3uuw0000065

SST Installation Note

1. Align the **SST** guide with the sirocco fan clip position and press the **SST** tabs **(3)** into the three set holes on the blower motor until they are inserted.

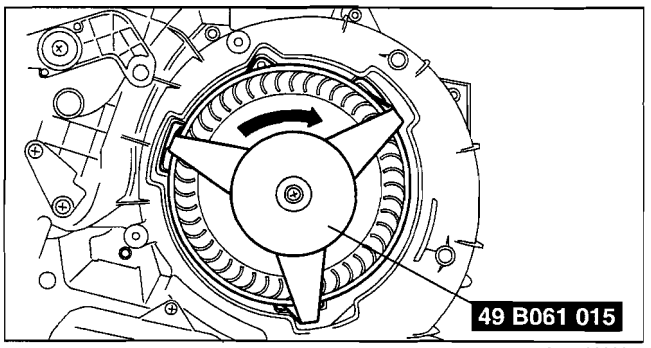


am3uuw0000065



am3zzw0000085

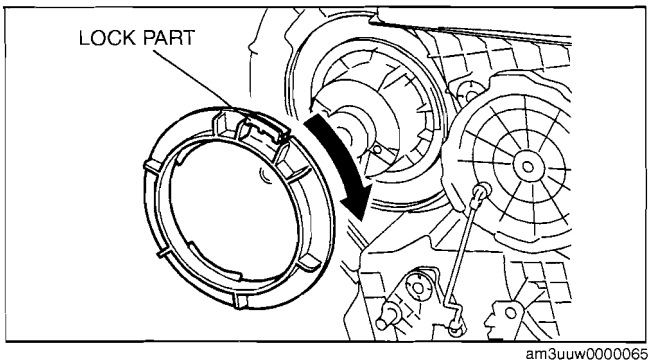
2. Rotate the **SST (49 B061 015)** clockwise to lock the **SST** and blower motor.



am3uuw0000065

Blower Motor Cover Removal Note

1. Pull the lock on the top of the blower motor cover and rotate the blower motor cover.

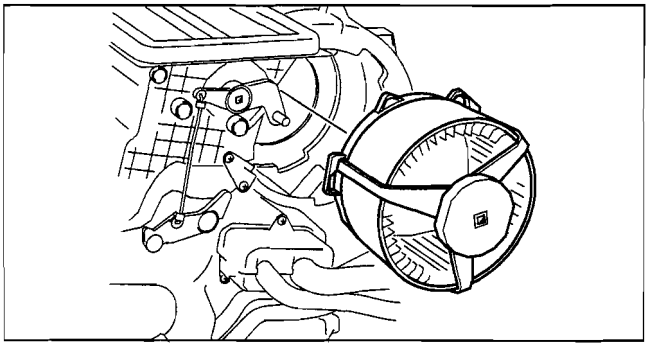


am3uuw0000065

Blower Motor Removal Note

Caution

- **To prevent damage to the sirocco fan, pull the blower motor out being careful that the blower motor does not interfere with the A/C unit.**

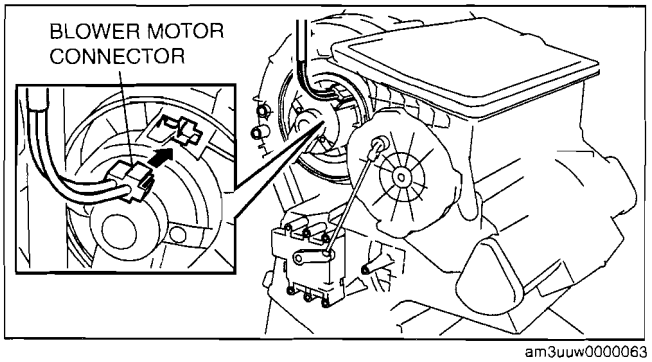


am3uuw0000065

BLOWER MOTOR INSTALLATION

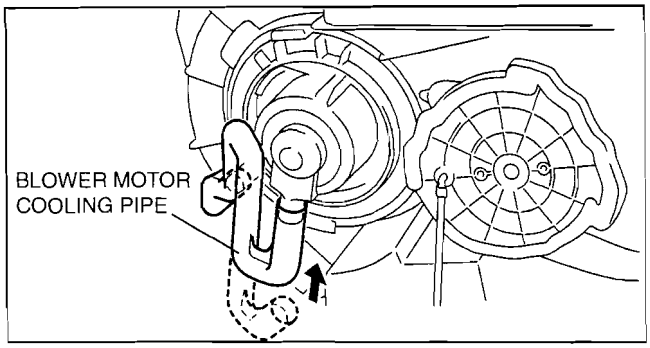
id074000807200

1. Install the **SST** to the blower motor. (See 07-40-10 BLOWER MOTOR REMOVAL.)
2. Install the blower motor with the **SST (49 B061 015)** installed, to the A/C unit. (See 07-40-15 Blower Motor Installation Note.)
3. Install the blower motor cover from the driver's side. (See 07-40-15 Blower Motor Cover Installation Note.)
4. Connect the blower motor connector as shown in the figure.



am3uuw0000063

5. Install the blower motor cooling pipe.
6. Remove the **SST (49 B061 015)** from the blower motor.
7. Install the airflow mode actuator. (See 07-40-9 AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION.)
8. Install the air guide.
9. Connect the resistor connector. (Manual air conditioner)
10. Install the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
11. Install the hood release lever from the lower panel. (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
12. Install the blower case.



am3uuw0000064

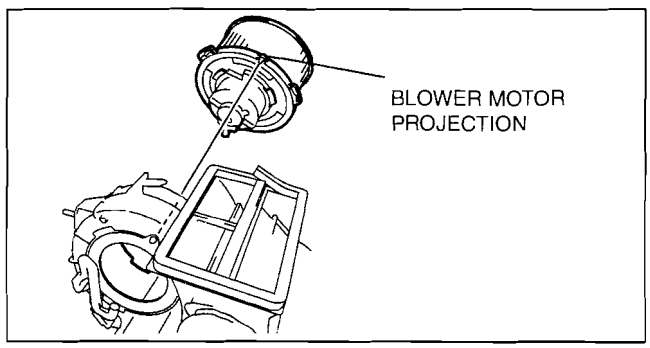
Caution
- **Install the blower case while pressing the dashboard insulator, otherwise the blower case could be damaged.**

13. Connect the air intake actuator connector.
14. Install the following parts:
    (1) Auto leveling control module
    (2) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
    (3) PJB and PJB bracket (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
    (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
    (5) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
    (6) Front side trim (RH) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
    (7) Front scuff plate (RH) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)

Blower Motor Installation Note

1. Position the blower motor projection upward and install the blower motor to the A/C unit.

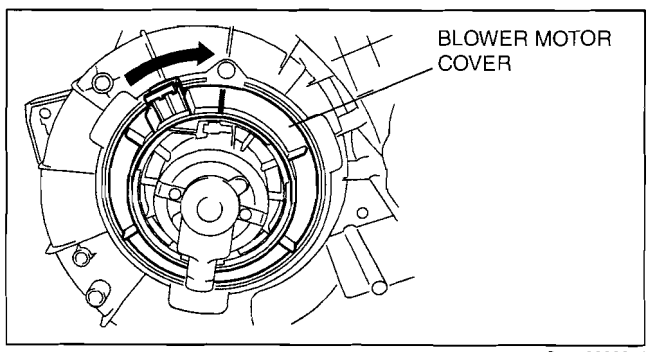
Caution
- **To prevent damage to the sirocco fan, install the blower motor being careful that the blower motor does not interfere with the A/C unit. Also, another person must hold the blower motor at the installation position.**



am3uuw0000064

Blower Motor Cover Installation Note

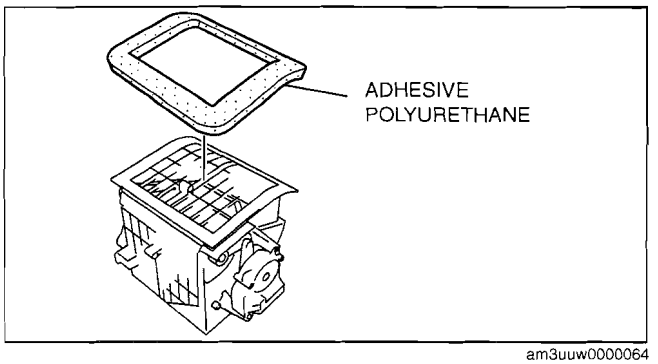
1. To install, rotate the blower motor cover until a click is heard.



am3uuw0000064

Blower Case Installation Note

1. If not replacing the blower case, replace the adhesive polyurethane on the fresh-air inlet of the blower case.



am3uuw0000064

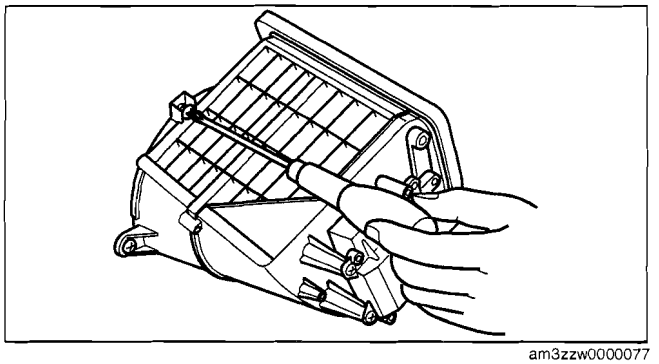
Caution

- **To adhere new polyurethane properly, be sure to remove the adhesive agent and adhesive polyurethane completely.**

Note

- If the blower case is removed or installed, the adhesive polyurethane can be damaged. Damaged adhesive polyurethane could cause abnormal noise or other malfunctions, therefore replace it.

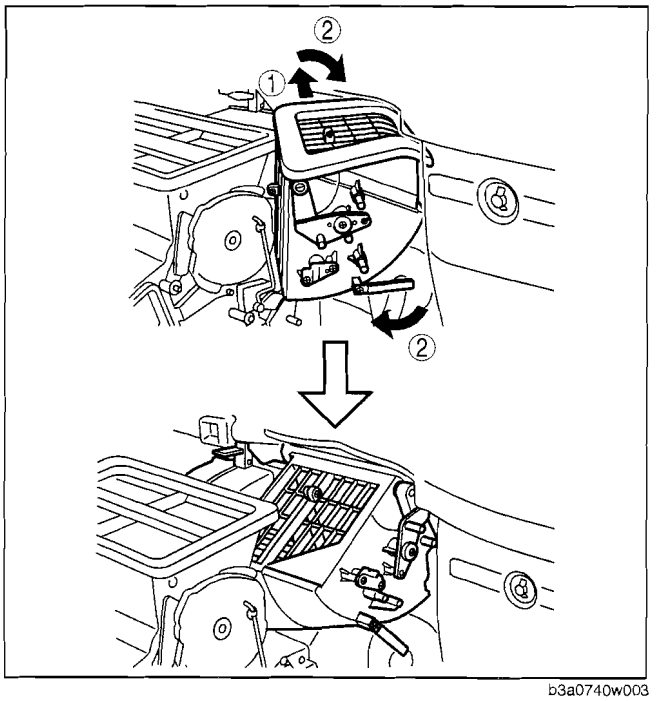
2. Insert the screw into the blower case and install the case to the A/C unit.



am3zzw0000077

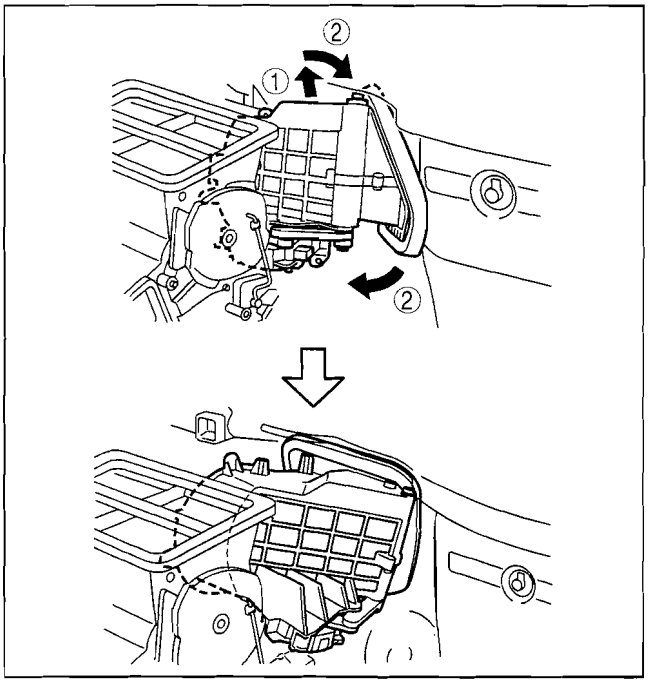
3. Install the blower case by inserting and rotating it in the directions of the arrows shown in the figure.

LF, L3



b3a0740w003

L3 with TC



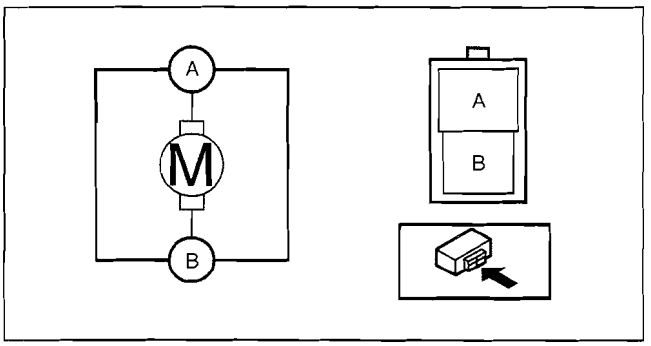
am3uuw0000064

BLOWER MOTOR INSPECTION

id074000801000

Connect battery positive voltage to blower motor terminal A, connect terminal B to ground, and then verify its operation.

- If there is any malfunction, replace the blower motor.



am3uuw0000062

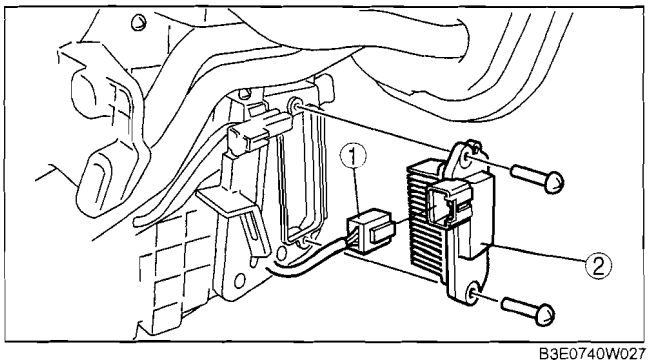
POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/ INSTALLATION

id074000800200

1. Disconnect the negative battery cable.
2. Remove the PJB and PJB bracket. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/ INSTALLATION.)
3. Remove in the order indicated in the table.

1	Power MOS FET connector
2	Power MOS FET

4. Install in the reverse order of removal.



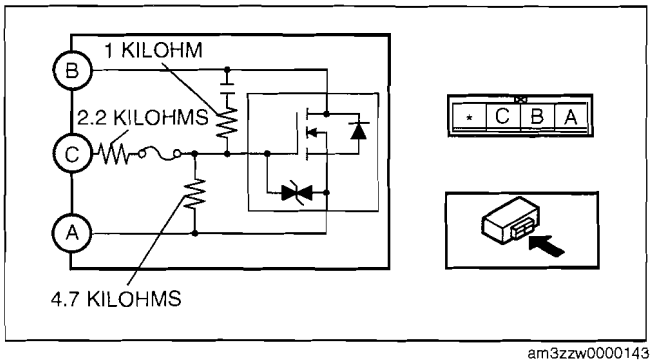
B3E0740W027

POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) INSPECTION

id074000800300

1. Verify that the continuity between the power MOS FET terminals is as indicated in the table.
   - If there is any malfunction, replace the power MOS FET.
   - If the blower motor operation is not normal even though no malfunction can be verified, inspect the climate control unit. (See 07-40-34 CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER].)

Tester lead		Resistance (kilohm)
+	-	
A	B	∞
A	C	6.9
B	A	Continuity detected
B	C	Continuity detected
C	A	6.9
C	B	∞

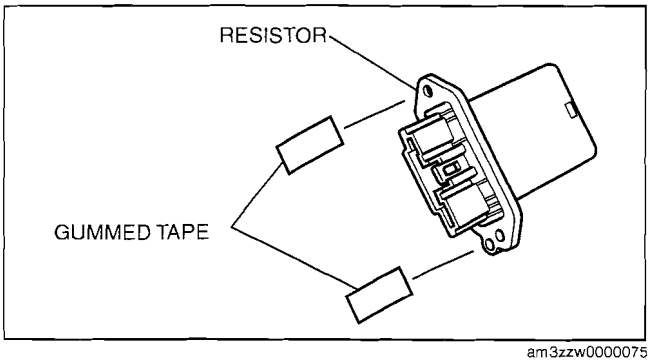


am3zzw0000143

RESISTOR REMOVAL/INSTALLATION

id074000800700

1. Remove the battery cover. (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
2. Disconnect the negative battery cable.
3. Remove the following parts:
   (1) Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
   (2) Accelerator pedal
4. Disconnect the blower motor cooling pipe connected to the blower motor.
5. Disconnect the resistor connector.
6. Remove the resistor.
7. Affix the gummed tape to the thread hole area as shown in the figure. (Do not wrap the packing tape around the backside of the resistor.)

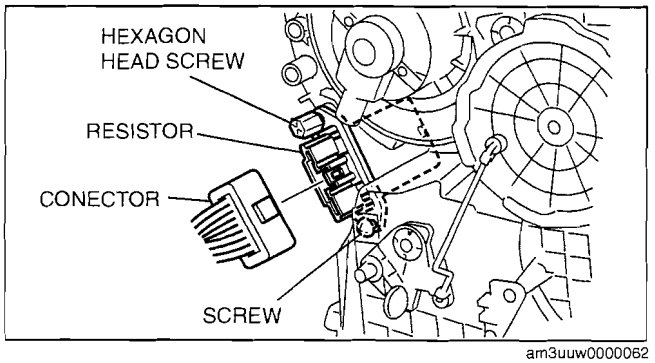


am3zzw0000075

8. Stick the screw into the thread hole.
9. Set the resistor to the A/C unit and temporarily tighten the hexagon head screw.

Caution

- **While setting the resistor, be careful not to damage the pattern surface. Otherwise it could cause a resistor operation malfunction.**



am3uuw0000062

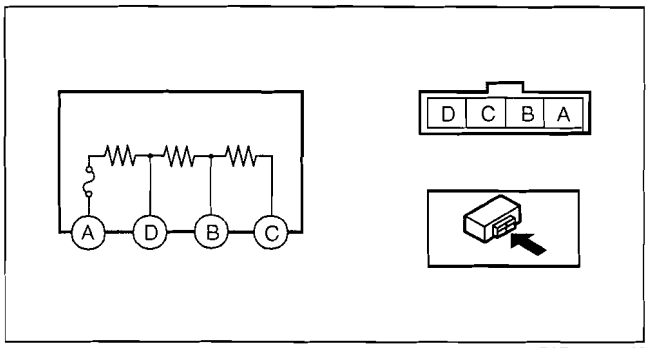
10. Tighten the lower screw.
11. Tighten the hexagon head screw.
12. Connect the resistor connector.
13. Connect the blower motor cooling pipe.
14. Install the following parts:
    (1) Accelerator pedal
    (2) Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
15. Connect the negative battery cable.
16. Install the battery cover.

RESISTOR INSPECTION

id074000800800

1. Verify that the resistance between the resistor terminals is as shown in the table.
   - If there is any malfunction, replace the resistor.

Terminal	Resistance (ohm)
A—D	0.27—0.30
A—B	1.30—1.49
A—C	2.10—2.40



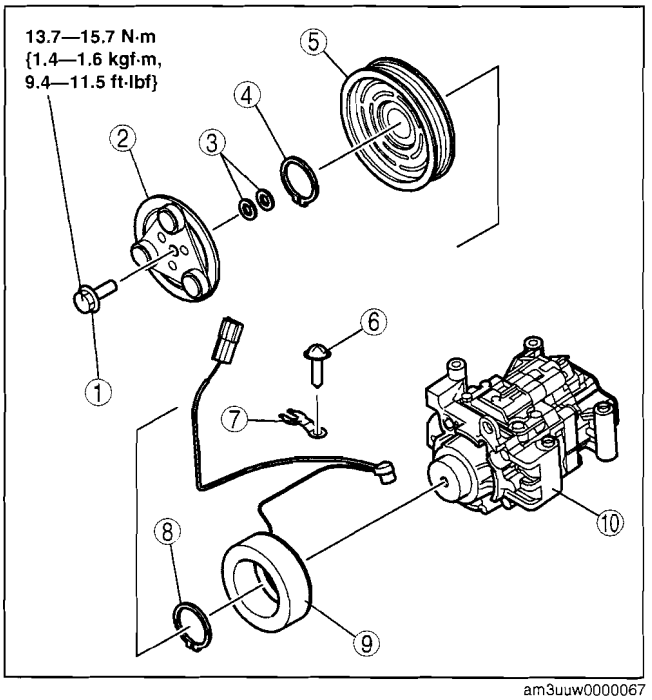
B3E0740W030

MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[LF, L3]

id0740008004c2

1. Disassemble in the order indicated in the table.

1	Bolt (See 07-40-19 Bolt Removal/Installation Note.)
2	Pressure plate
3	Shim
4	Snap ring (See 07-40-20 Snap Ring Installation Note.)
5	A/C compressor pulley
6	Screw (See 07-40-20 Screw Installation Note.)
7	Clamp (See 07-40-20 Clamp Installation Note.)
8	Snap ring (See 07-40-20 Snap Ring Installation Note.)
9	Stator and thermal protector (See 07-40-19 Stator and Thermal Protector Removal Note.) (See 07-40-20 Stator and Thermal Protector Installation Note.)
10	A/C compressor body

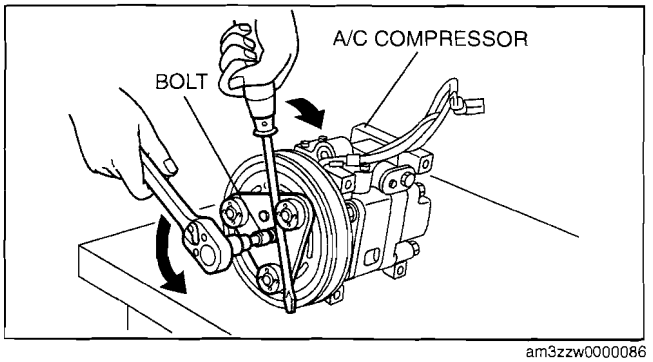


am3uuw0000067

2. Assemble in the reverse order of disassembly.
3. Adjust the magnetic clutch clearance. (See 07-40-21 MAGNETIC CLUTCH ADJUSTMENT.)

Bolt Removal/Installation Note

1. When removing or installing the bolt, hold the pressure plate in place as shown in the figure.
2. When installing a new A/C compressor body, replace the recommended bolt.



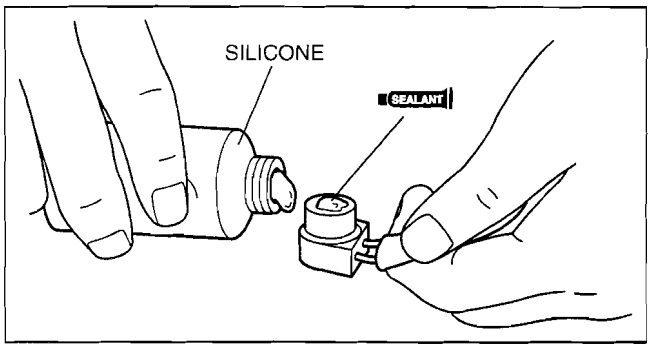
am3zzw0000086

Stator and Thermal Protector Removal Note

1. After removing the stator and thermal protector, completely remove the silicone adhering to the A/C compressor side.

Stator and Thermal Protector Installation Note

1. Apply **approx. 1 g {0.04 oz}** of silicone (Shin-Etsu Silicone KE-347W or similar) to the contact surface of the thermal protector, then thoroughly install it onto the A/C compressor, leaving no gaps.



am3zzw0000086

Screw Installation Note

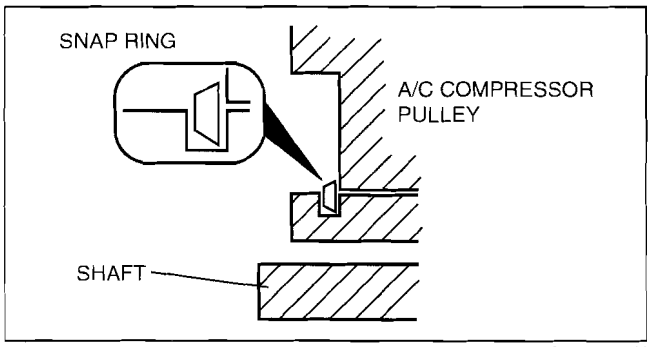
1. When installing a new stator and thermal protector, replace the screw.

Clamp Installation Note

1. When installing a new stator and thermal protector, replace the clamp.

Snap Ring Installation Note

1. When installing a new pressure plate, A/C compressor pulley, stator, or A/C compressor body, replace the snap ring.



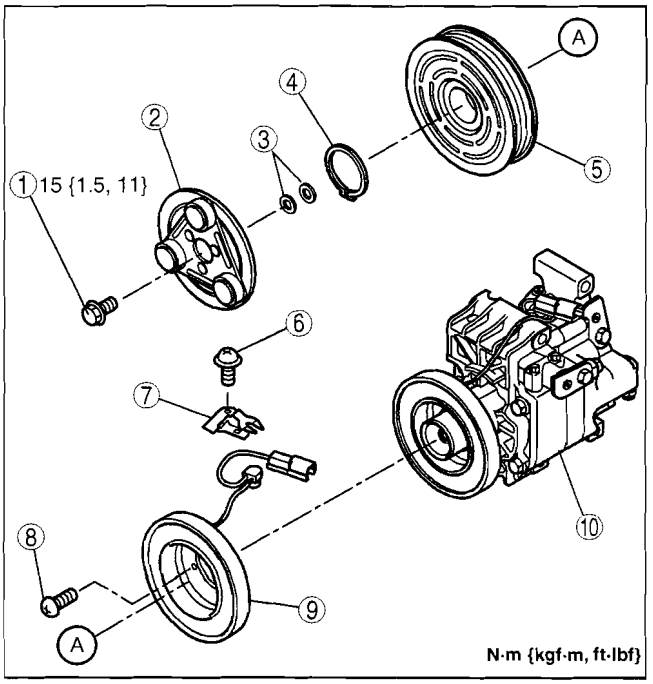
am3zzw0000086

MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC]

id074000800439

1. Disassemble in the order indicated in the table.

1	Bolt (See 07-40-21 Bolt Removal/Installation Note.)
2	Pressure plate
3	Shim
4	Snap ring (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].)
5	A/C compressor pulley
6	Screw (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].)
7	Clamp (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].)
8	Screw
9	Stator and thermal protector (See 07-40-20 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY[L3 WITH TC].)
10	A/C compressor body



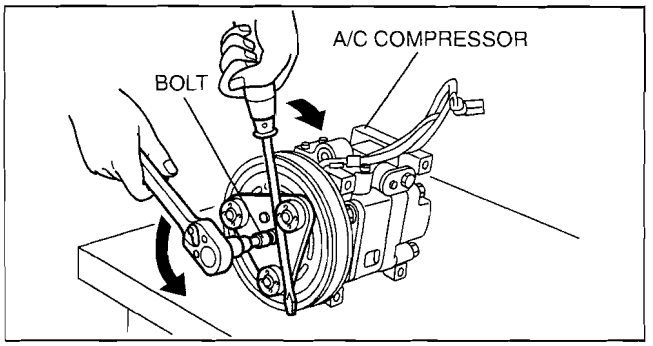
am3uuw0000062

2. Assemble in the reverse order of disassembly.
3. Adjust the magnetic clutch clearance. (See 07-40-21 MAGNETIC CLUTCH ADJUSTMENT.)

Bolt Removal/Installation Note

Note
- If there are only 2 prepackaged bolts available when replacing the compression with a repair part, select bolts from the replaced unit of the same length as the prepackaged bolts.

1. When removing or installing the bolt, hold the pressure plate in place as shown in the figure.
2. When installing a new A/C compressor body, replace the bolt.

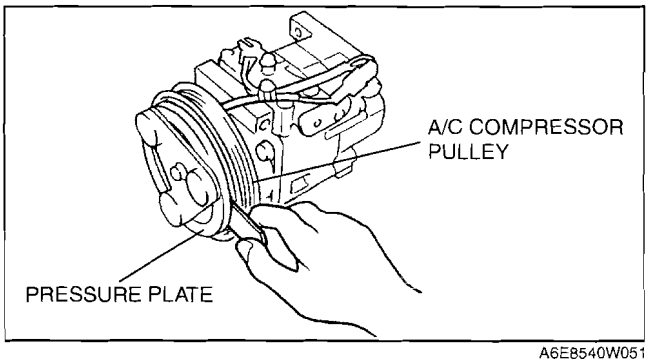


am3zzw0000086

MAGNETIC CLUTCH ADJUSTMENT

id074000800500

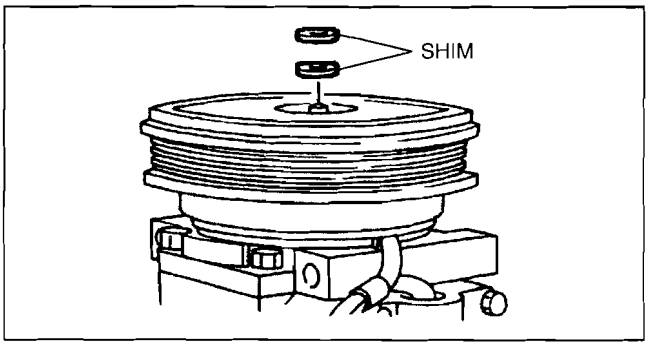
1. Measure the clearance around the entire circumference between the pressure plate and A/C compressor pulley using a thickness gauge.



A6E8540W051

2. Verify that the clearance.
   - If not within the specification, remove the pressure plate and adjust the clearance by changing the shim (**0.2 mm {0.008 in}, 0.5 mm {0.02 in}**) or the number of shims.

Clearance
0.3—0.5 mm {0.012—0.019 in}

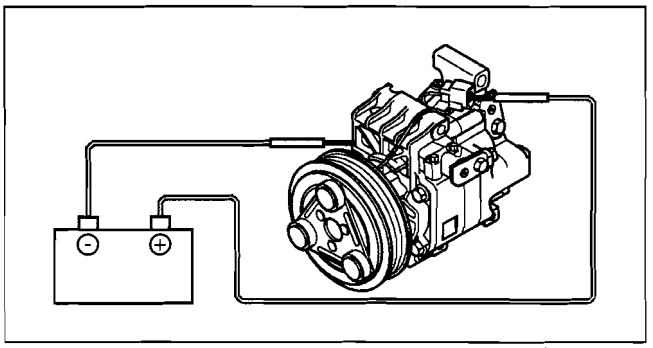


a6e8540w052

MAGNETIC CLUTCH INSPECTION[L3 WITH TC]

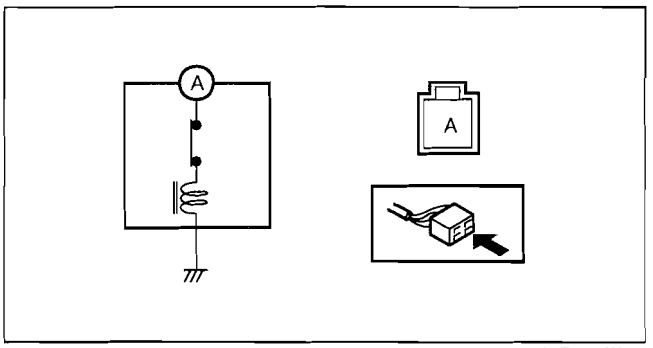
id074000800639

1. Connect battery positive voltage to terminal A of magnetic clutch and ground to A/C compressor body.



A6E8540W015

2. Verify that the magnetic clutch operates.
   - If there is any malfunction, replace the stator and thermal protector.

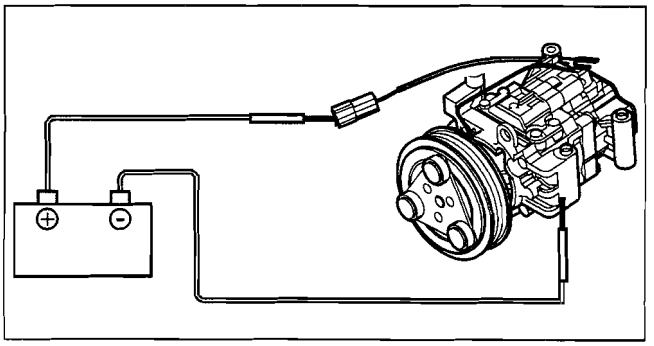


A6E8540W016

MAGNETIC CLUTCH INSPECTION[LF, L3]

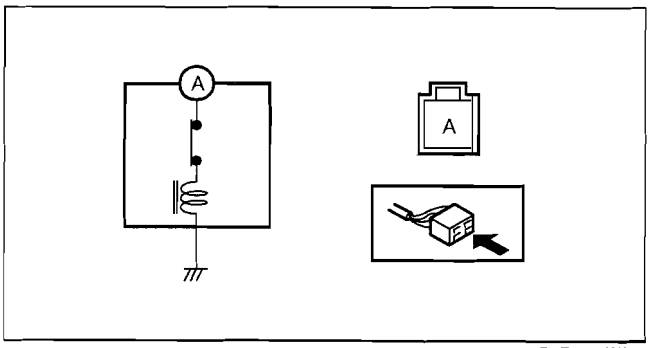
id0740008006c2

1. Connect battery positive voltage to magnetic clutch terminal A and the A/C compressor body to ground.



B3E0740W064

2. Verify that the magnetic clutch operates.
   - If there is any malfunction, replace the stator and thermal protector.



B3E0740W034

SOLAR RADIATION SENSOR REMOVAL/INSTALLATION

id074000802800

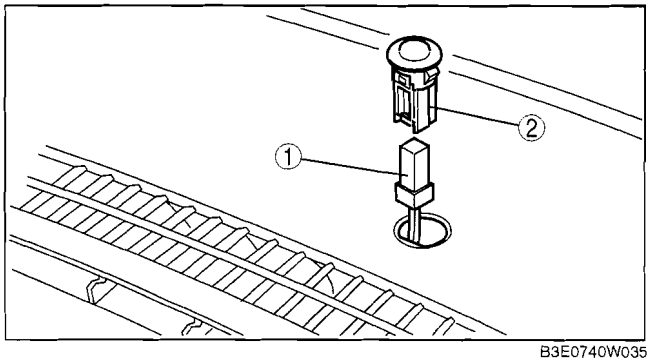
1. Disconnect the negative battery cable.
2. Pry the solar radiation sensor from the dashboard using a flathead screwdriver wrapped with protective tape.
3. Remove in the order indicated in the table.

Caution

- **After the solar radiation sensor removal, the sensor connector could fall in the dashboard making the installation difficult. Therefore, hold the rooted end of the sensor connector using a clip or similar tool to prevent it from falling.**

1	Solar radiation sensor connector
2	Solar radiation sensor

4. Install in the reverse order of removal.

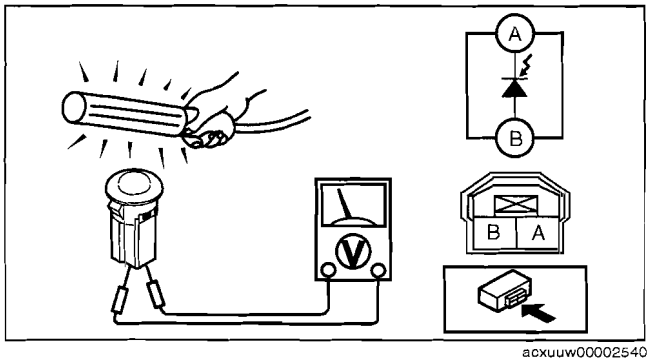


B3E0740W035

SOLAR RADIATION SENSOR INSPECTION

id074000802900

1. Shine a fluorescent light or expose the solar radiation sensor to natural sunlight.
2. Connect the positive (+) lead to terminal A and the negative (–) lead to terminal B of the solar radiation sensor, and verify that the voltages are as shown in the table.
   - If the voltage is not as specified, replace the solar radiation sensor.



acxuuw00002540

O—O: Continuity

Test condition	Voltage (V)
Sensor subject to fluorescent light or natural sunlight	0.1—0.45
Sensor covered by a cloth	0.1 or less

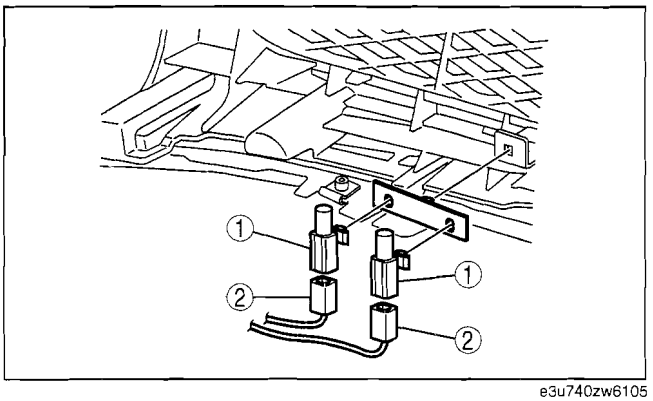
acxuuw00002541

AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

id074000803200

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

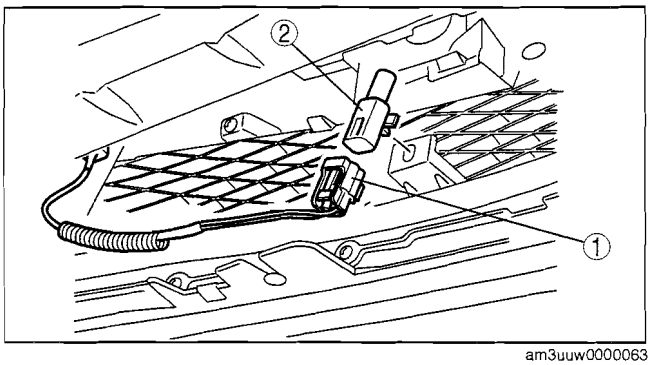
LF, L3



e3u740zw6105

L3 with TC

1	Ambient temperature sensor connector
2	Ambient temperature sensor



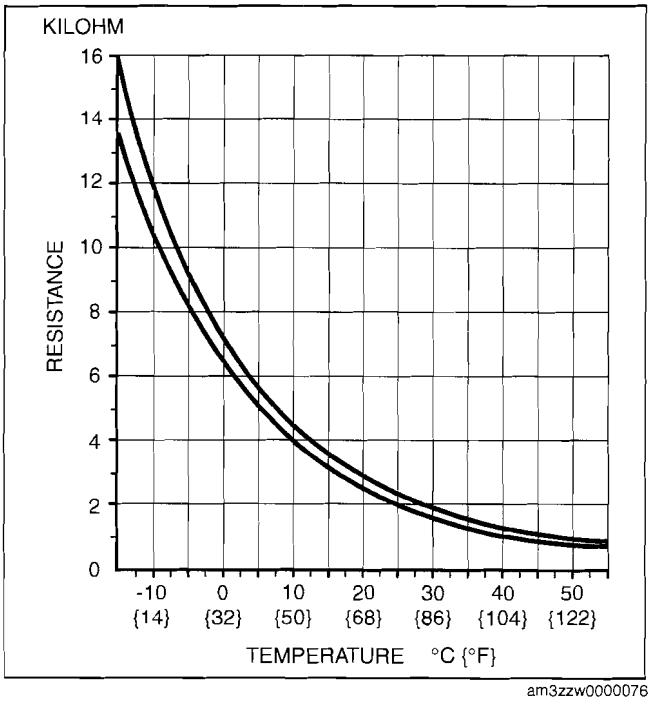
am3uuw0000063

3. Install in the reverse order of removal.

AMBIENT TEMPERATURE SENSOR INSPECTION

id074000803300

1. Measure the temperature around the ambient temperature sensor and measure the resistance between the ambient temperature sensor terminal.
   - If the characteristics of the ambient temperature sensor are not as shown in the graph, replace the ambient temperature sensor.



am3zzw0000076

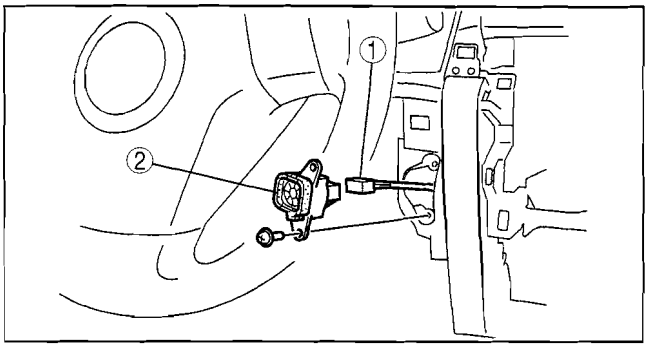
PASSENGER COMPARTMENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

id074000803000

1. Disconnect the negative battery cable.
2. Remove the lower panel. (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Passenger compartment temperature sensor connector
2	Passenger compartment temperature sensor

4. install in the reverse order of removal.

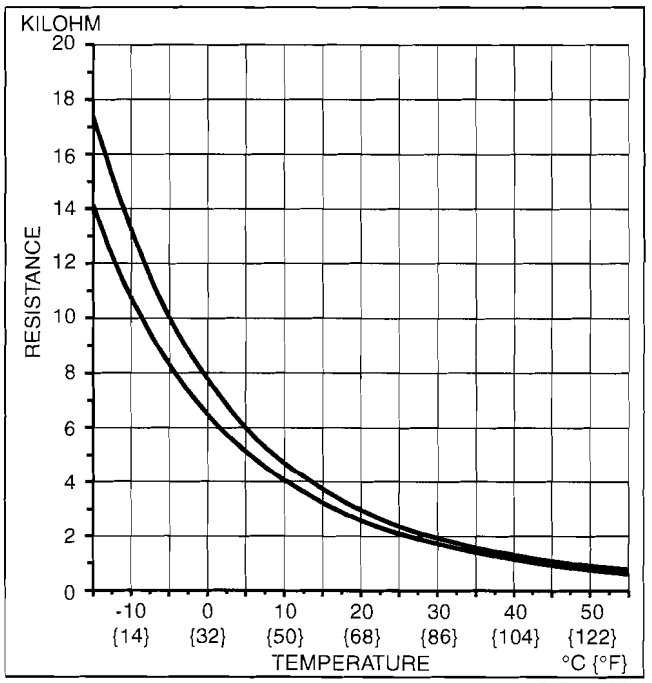


B3E0740W038

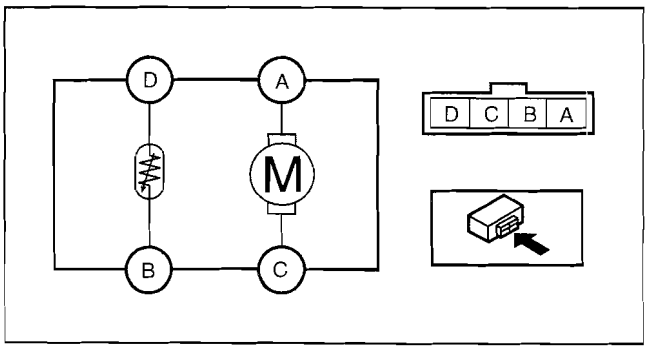
PASSENGER COMPARTMENT TEMPERATURE SENSOR INSPECTION

id074000803100

1. Measure the temperature around the passenger compartment temperature sensor and measure the resistance between passenger compartment temperature sensor terminals B and D.
   - If the characteristics of the passenger compartment temperature sensor are not as shown in the graph, replace the passenger compartment temperature sensor.
2. Connect battery positive voltage to passenger compartment temperature sensor terminal A and connect terminal C to ground to verify fan operation.
   - If there is any malfunction, replace the passenger compartment temperature sensor.



B3E0740W039



B3E0740W040

07-40

EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION

id074000801100

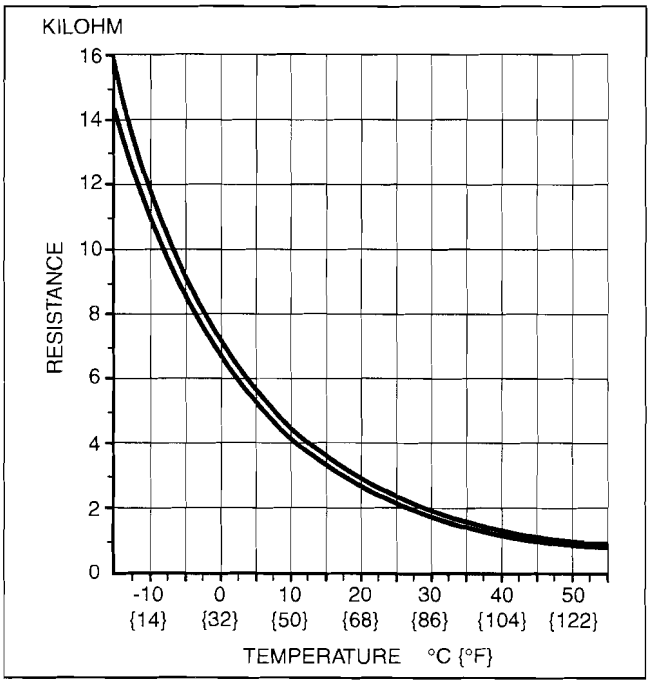
1. Remove the evaporator temperature sensor from the A/C unit. (See 07-11-7 A/C UNIT DISASSEMBLY/ASSEMBLY[FULL-AUTO AIR CONDITIONER].) (See 07-11-10 A/C UNIT DISASSEMBLY/ASSEMBLY[MANUAL AIR CONDITIONER].)

EVAPORATOR TEMPERATURE SENSOR INSPECTION

id074000801200

Note
- Inspect the evaporator temperature sensor when it is installed to the A/C unit.

1. Set the fan speed MAX HI.
2. Set the temperature control at MAX COLD.
3. Set the RECIRCULATE mode.
4. Turn the A/C switch off.
5. Close all doors and windows.
6. Wait for **5 min**.
7. Disconnect the evaporator temperature sensor connector.
8. Measure the temperature at the blower inlet.
9. Measure the resistance between the evaporator temperature sensor terminals.
   - If the resistance is not as shown in the graph, replace the evaporator temperature sensor.



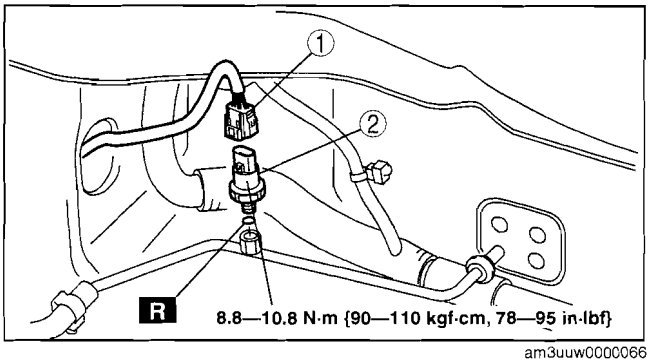
am3zzw0000075

REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

id074000802600

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07-10-2 REFRIGERANT CHARGING.)
3. Remove the P/S fluid reserve tank. (L3 with TC)
4. Remove the coolant reserve tank. (L3 with TC)
5. Loosen the refrigerant pressure switch using two spanners.
6. Remove in the order indicated in the table.

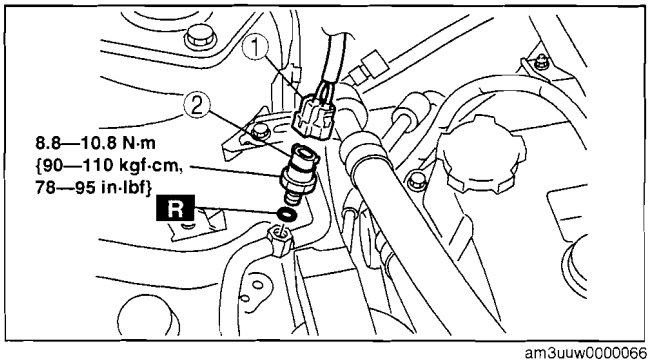
LF, L3



am3uuw0000066

L3 with TC

1	Refrigerant pressure switch connector
2	Refrigerant pressure switch (See 07-40-27 Refrigerant Pressure Switch Installation Note.)



am3uuw0000066

7. Install in the reverse order of removal.

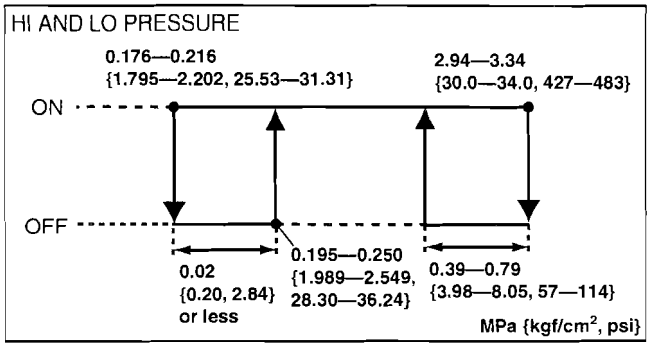
Refrigerant Pressure Switch Installation Note

1. Apply compressor oil to O-ring and connect the joint.

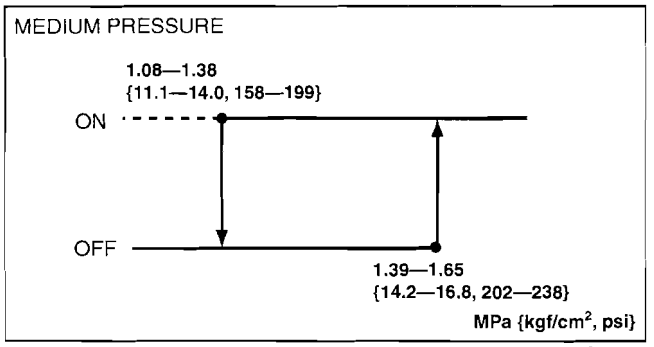
REFRIGERANT PRESSURE SWITCH INSPECTION

id074000802700

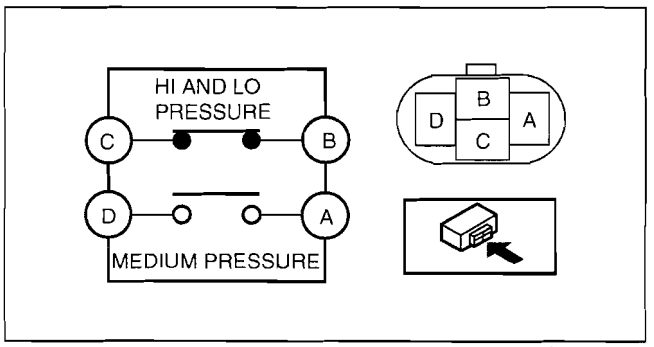
1. Install the gas charging set.
2. Disconnect the refrigerant pressure switch connector.
3. Verify the high-pressure side reading of the manifold gauge and continuity between the refrigerant pressure switch terminals.
   - If there is any malfunction, replace the refrigerant pressure switch.



am3zzw0000076



am3uuw0000066

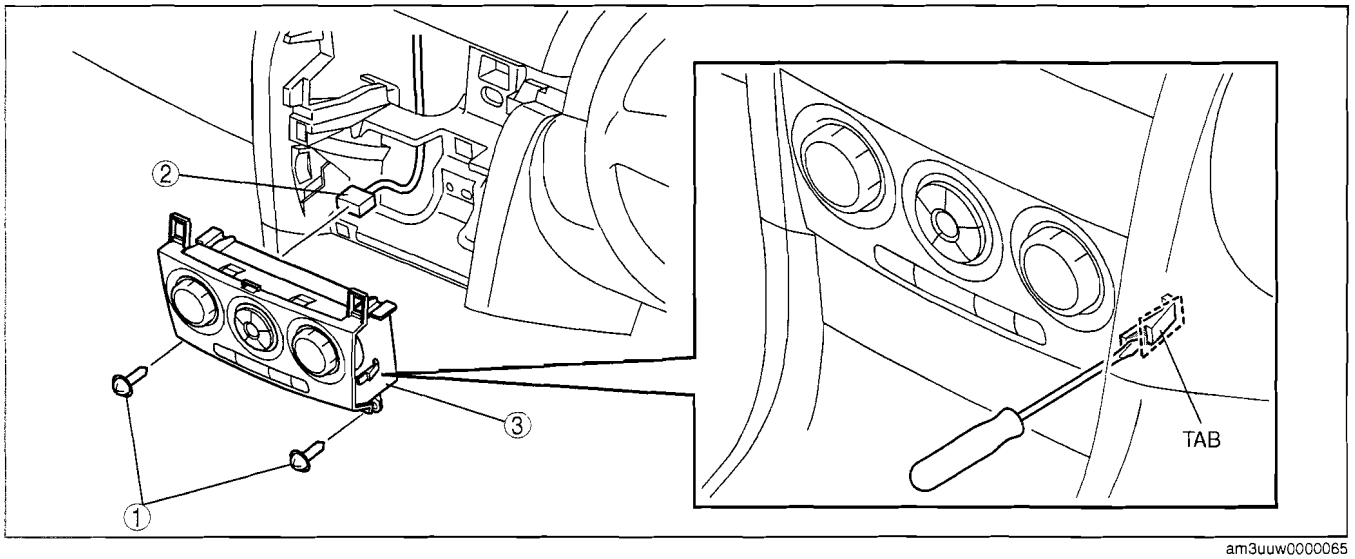


am3uuw0000066

CLIMATE CONTROL UNIT REMOVAL/INSTALLATION[FULL-AUTO AIR CONDITIONER]

id0740008074a1

1. Disconnect the negative battery cable.
2. Remove the ashtray panel.
3. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
4. Remove the decoration panel. (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
5. Remove the center panel module. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.)
6. Release the left and right tabs and remove as shown in the figure.



am3uuw0000065

1	Screw
2	Climate control unit connector

3	Climate control unit

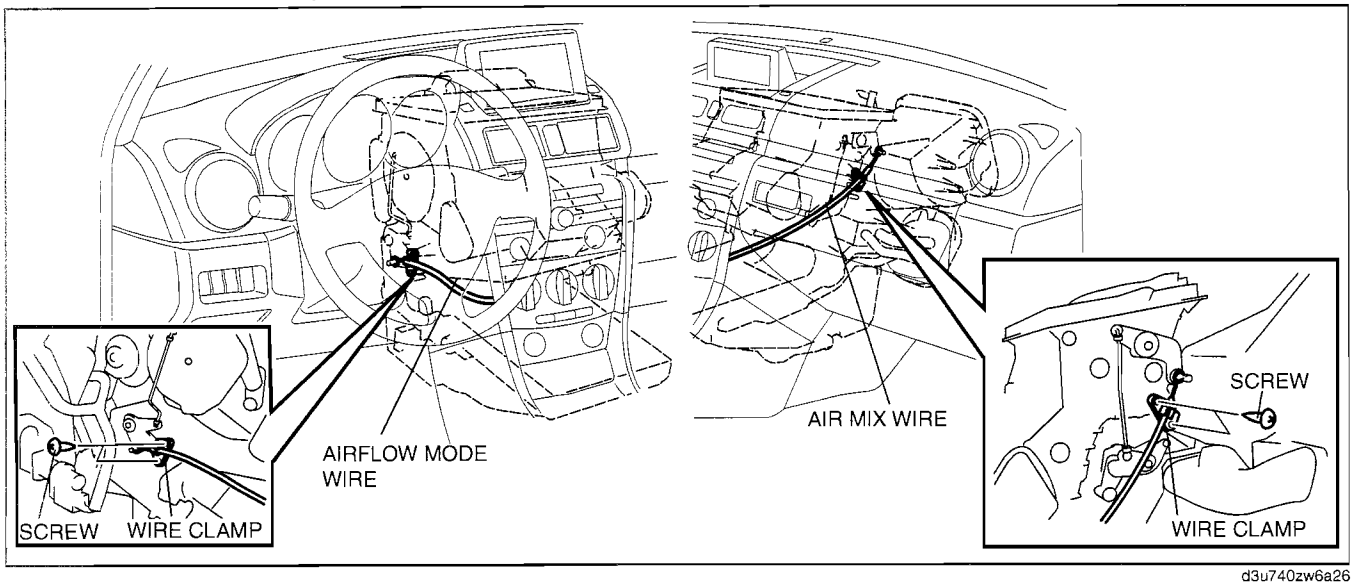
7. Install in the reverse order of removal.

CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER]

id0740008018a2

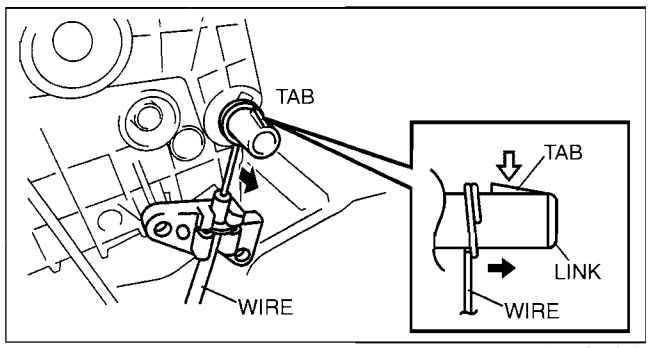
1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Ashtray panel
   (2) Detach the hood release lever from the lower panel. (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (3) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (5) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (6) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (7) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (8) PJB and PJB bracket (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
   (9) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Detach the PJB wiring harness clamp from the dashboard.
4. Remove the center panel module. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.)

5. Remove the wire clamp screws from the A/C unit at the positions shown in the figure.

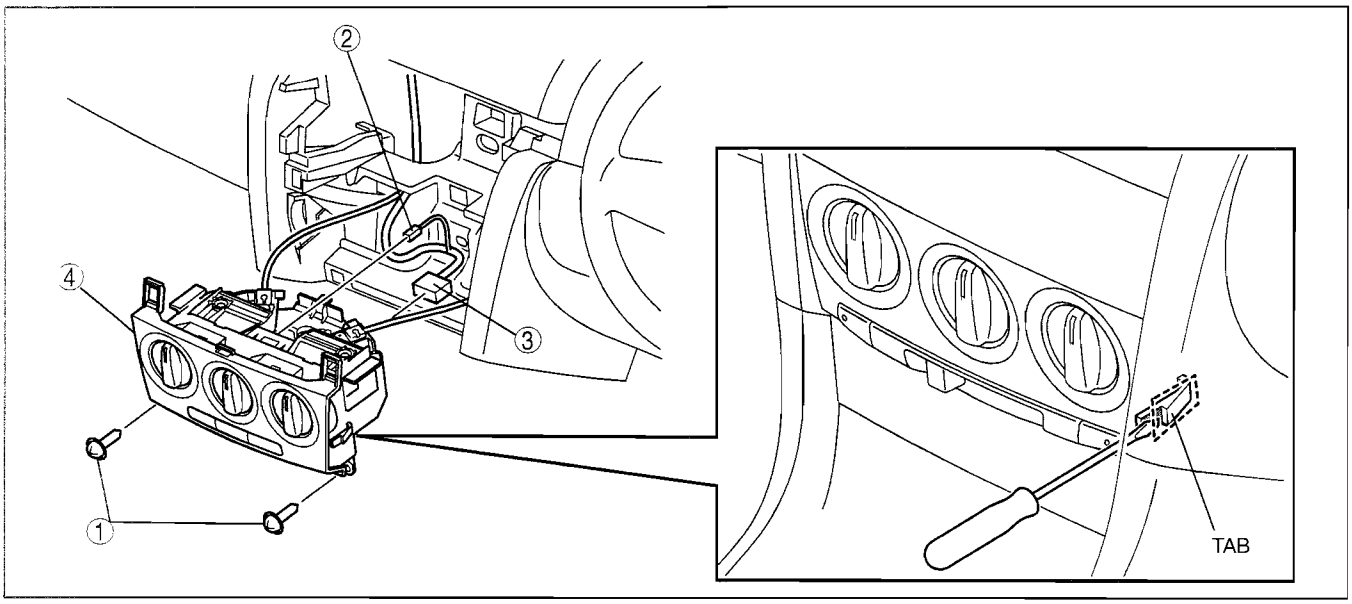


d3u740zw6a26

6. Remove the air mix wire and airflow mode wire.
   (1) Pull the wire in the direction shown by the arrow and remove it while pressing the link tab.
7. Release the left and right tabs and remove in the order indicated in the table.



d3u740zw6a27

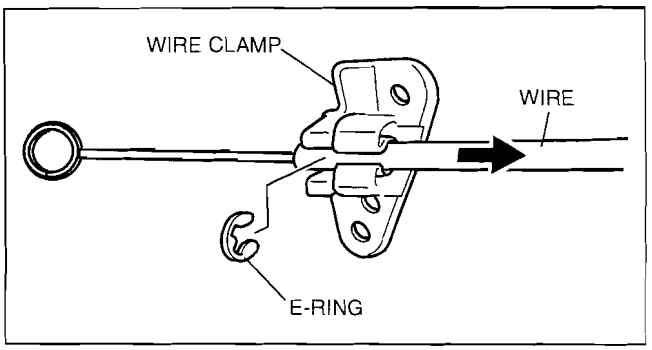


am3uuw0000066

1	Screw
2	Fan switch connector

3	Climate control unit connector
4	Climate control unit

8. Remove the E-rings from the air mix wire and airflow mode wire, slide the wires in the direction shown by the arrow, then remove the wire clamps from the air mix wire and airflow mode wire.

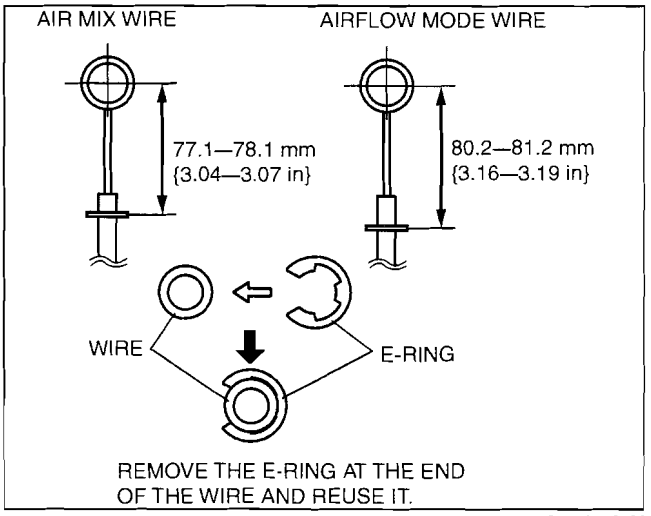


d3u740zw6a10

CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER]

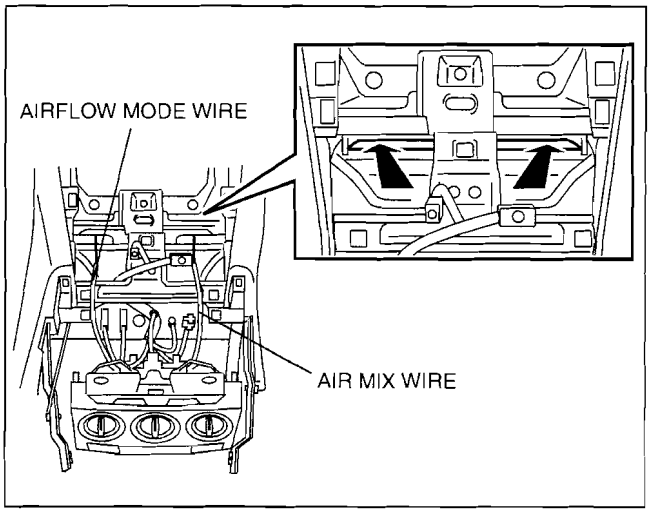
id0740008019a2

1. Install the wire clamp to the A/C unit.
2. Set the temperature control dial at MAX COLD.
3. Set the airflow mode selector dial at defroster.
4. Install the E-rings to each position on the wires shown in the figure.



e3u740zw6a20

5. Pass each wire through the following routes and connect to A/C unit.
6. Connect the climate control unit connectors.
7. Install the climate control unit.
8. Adjust the climate control unit wires. (See 07-40-33 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.)
9. Install the center panel module.
10. Attach the PJB wiring harness clamp to dashboard.
11. Install the following parts:
    (1) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
    (2) PJB and PJB bracket. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
    (3) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
    (4) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
    (5) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
    (6) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
    (7) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
    (8) Detach the hood release lever from the lower panel. (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
    (9) Ashtray panel
12. Connect the negative battery cable.



am3uuw0000066

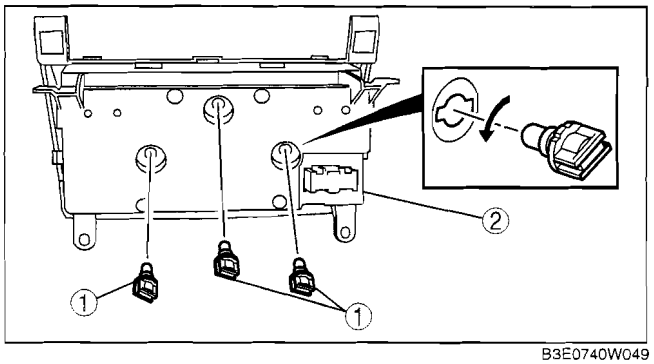
CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY[FULL-AUTO AIR CONDITIONER]

id0740008020a1

1. Disassemble in the order indicated in the table.

1	Bulb
2	Body

2. Assemble in the reverse order of disassembly.

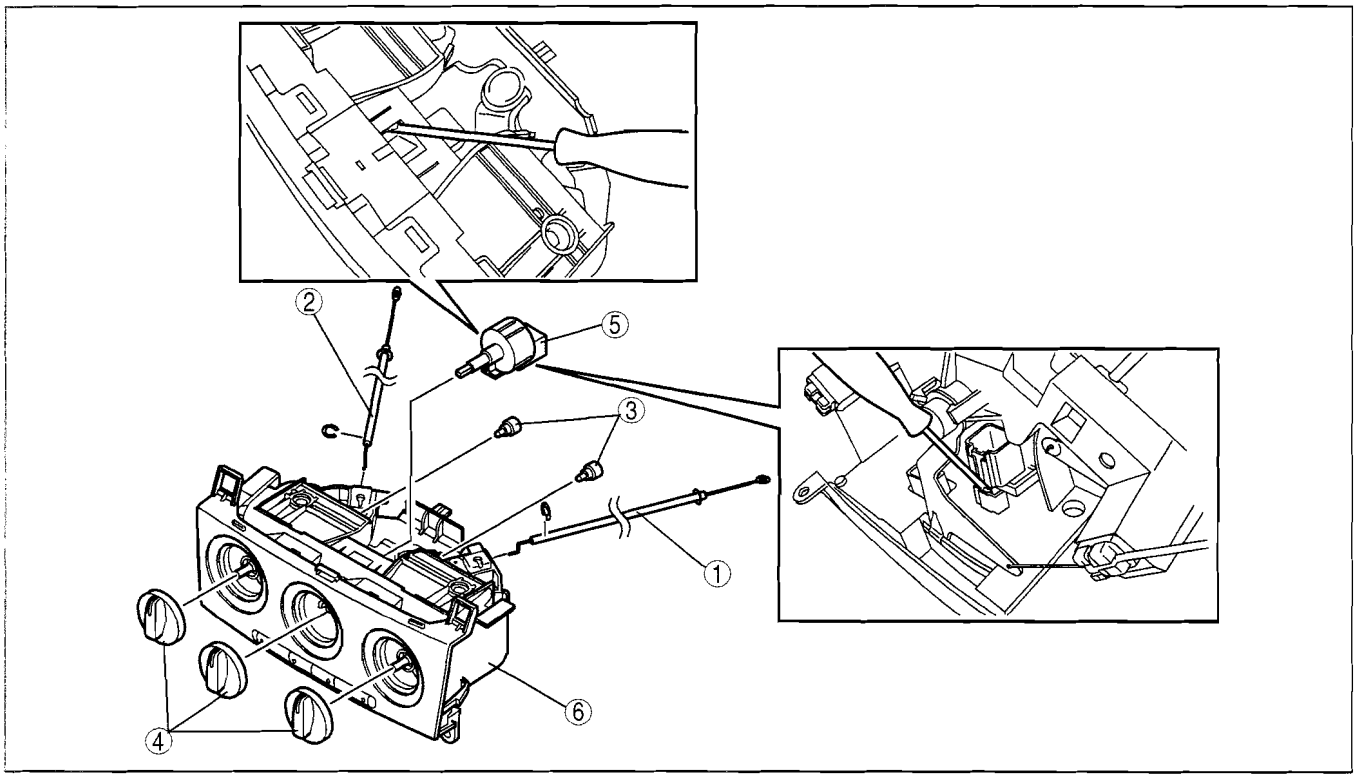


B3E0740W049

CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY[MANUAL AIR CONDITIONER]

id0740008020a2

1. Disassemble in the order indicated in the table.



am3uuw0000066

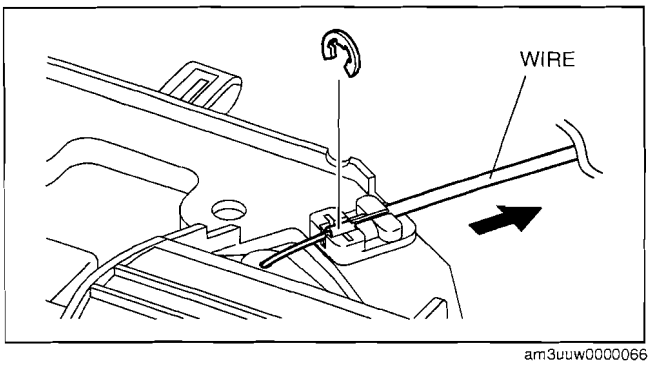
1	Air mix wire (See 07-40-33 Wire Disassembly Note.) (See 07-40-33 Wire Assembly Note.)
2	Airflow mode wire (See 07-40-33 Wire Disassembly Note.) (See 07-40-33 Wire Assembly Note.)

3	Illumination bulb
4	Knob
5	Fan switch
6	Body

2. Assemble in the reverse order of disassembly.

Wire Disassembly Note

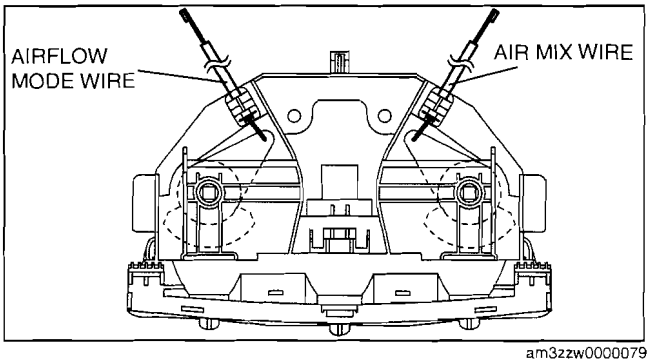
1. Disassemble the wires as shown in the figure.



am3uuw0000066

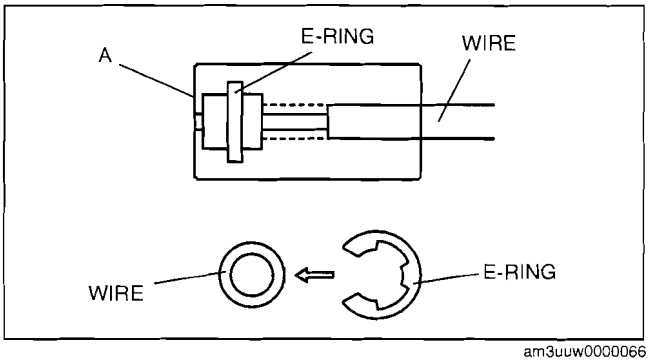
Wire Assembly Note

1. Assemble the wires at the positions shown in the figure.



am3zzw0000079

2. Assemble E-ring with the wire pressed against surface A.
   - If the E-ring has beer lost, the one at the wire end can be removed and reused.



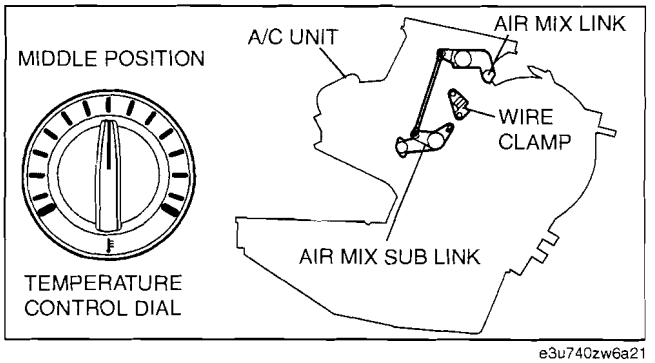
am3uuw0000066

CLIMATE CONTROL UNIT WIRE ADJUSTMENT

id074000802100

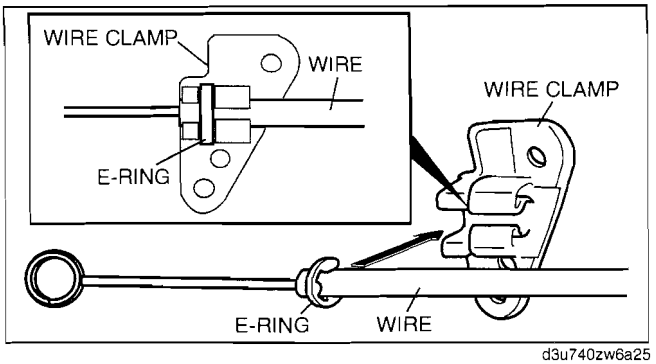
Air Mix Wire

1. Set the temperature control dial at middle position (MAX HOT—MAX COLD).
2. Connect the air mix wire to air mix link.



e3u740zw6a21

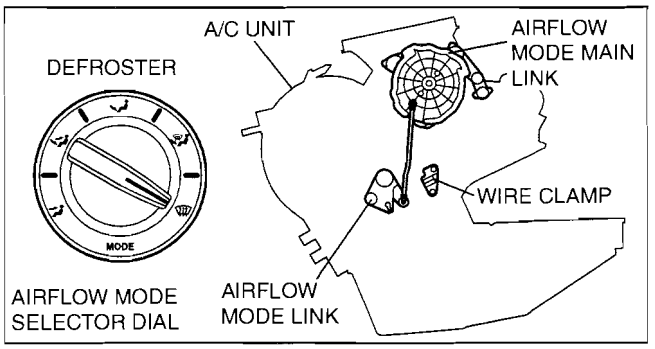
3. Install the air mix wire to the wire clamp as shown in the figure.
4. Remove the screwdriver and verify that the temperature control dial can move its full stroke.



d3u740zw6a25

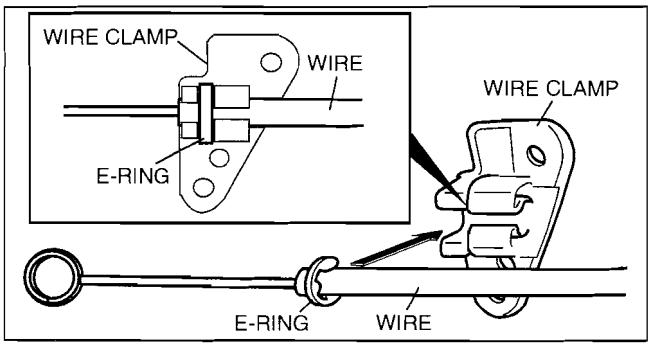
Airflow Mode Wire

1. Set the airflow mode selector dial at defroster.
2. Connect the airflow mode wire to airflow mode link.



e3u740zw6a22

3. Install the airflow mode wire to the wire clamp as shown in the figure.
4. Remove the screwdriver and verify that the airflow mode selector dial can move its full stroke.



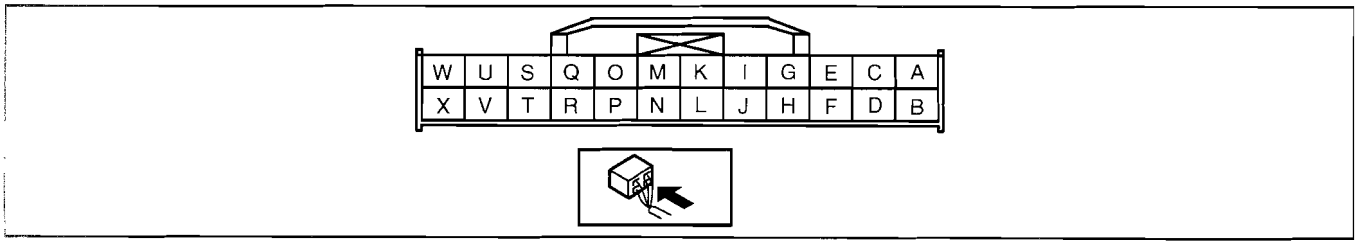
d3u740zw6a25

CLIMATE CONTROL UNIT INSPECTION[FULL-AUTO AIR CONDITIONER]

id0740008022a1

1. Turn the ignition switch to the ON position.
2. Connect the negative (-) lead of the tester to body ground.
3. By inserting the positive (+) lead of the tester into each climate control unit terminal, measure the voltage according to the terminal voltage table.
   - If there is any malfunction, inspect the parts under "Inspection item (s)".
     — If the parts under "Inspection item (s)" are found to be normal (except for terminal F), replace the climate control unit.
     — For terminal F, first try replacing the power MOS FET. If there is still any malfunction, replace the climate control unit.

Terminal Voltage Table (Reference)



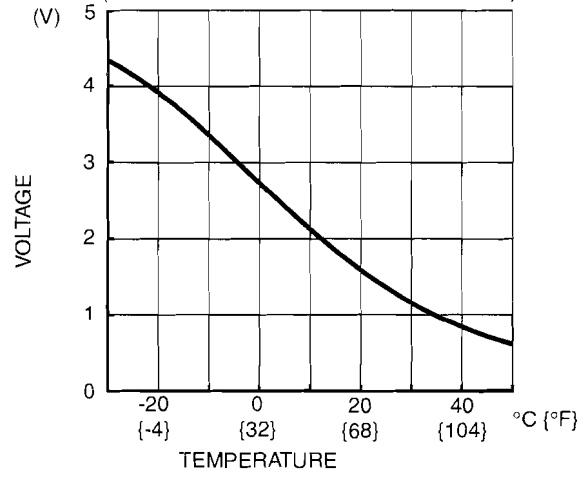
am3uuw0000017

Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
A	TNS signal	PJB	Headlight switch OFF	1.0 or less	• Wiring harness: short circuit (Climate control unit—PJB: A—J-03 H) • Panel light control switch • Headlight switch
			Headlight switch ON	B+	• Wiring harness: continuity, short circuit (Climate control unit—PJB: A—J-03 H) • Panel light control switch • Headlight switch
B	TNS signal	Panel light control switch	Headlight switch ON and panel light control switch at max. illumination	1.0 or less	• Wiring harness: continuity (Climate control unit—panel light control switch: B—F) • Panel light control switch • Climate control unit: terminal voltage (A)
			Headlight switch ON and panel light control switch at min. illumination	12	• Wiring harness: short circuit (Climate control unit—panel light control switch: B—F)
C	Motor operation	Air mix actuator	Moving towards COLD	12	• Wiring harness: continuity, short circuit (Climate control unit—air mix actuator: C—D, E—F) • Air mix actuator
			Moving towards HOT	1.0 or less	
D	Blower fan speed control	Power MOS FET	Fan stopped	1.0 or less	• Climate control unit: terminal voltage (F)
			Fan: manual LO	2.9	
			Fan: manual HI	9.7	
E	Motor operation	Air mix actuator	fluorescent light shined directly on the solar radiation sensor	0.1—0.45	• Wiring harness: continuity, short circuit (Climate control unit—air mix actuator: E—F, C—D) • Air mix actuator
			Blocking light to solar radiation sensor	0.1 or less	
F	Blower motor feedback	• Blower motor • Power MOS FET	Fan stopped	B+	1. Wiring harness: continuity, short circuit (Climate control unit—blower motor: F—B) (Climate control unit—power MOS FET: F—B, D—C) (Blower motor—blower relay: A—E) (Blower relay—fuse: A—HEATER 40 A, B—A/C 10 A) 2. Wiring harness: continuity (Power MOS FET—body ground: A—GND) (Blower relay—body ground: D—GND) 3. Power MOS FET 4. Blower motor 5. Blower relay 6. A/C 10 A fuse 7. HEATER 40 A fuse 8. Power MOS FET replacement
			Fan: manual LO	9.8	
			Fan: manual HI	0.5	
G	Motor operation	Airflow mode actuator	Switched to DEFROSTER	12	• Wiring harness: continuity, short circuit (Climate control unit—airflow mode actuator: G—D, I—F) • Airflow mode actuator
			Switched to VENT	1.0 or less	
H	—	—	—	—	—
I	Motor operation	Airflow mode actuator	Switched to DEFROSTER	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit—airflow mode actuator: I—F, G—D) • Airflow mode actuator
			Switched to VENT	12	
J	B+	ROOM 15 A fuse	Under any condition	B+	• Wiring harness: continuity, short circuit (Climate control unit— fuse: J—ROOM 15 A) • ROOM 15 A fuse

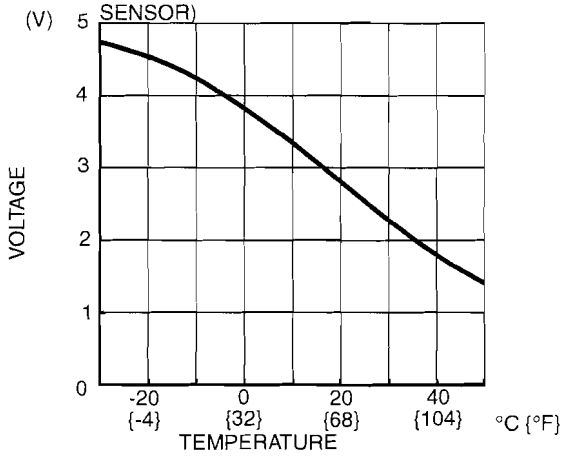
Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
K	IG2	A/C 10 A fuse	IG SW ON	B+	• Wiring harness: continuity, short circuit (Climate control unit— fuse: K—A/C 10 A) • A/C 10 A fuse
			IG SW LOCK	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit— fuse: K—A/C 10 A)
L	Potentiometer input	Airflow mode actuator	VENT	4.5	• Wiring harness: continuity, short circuit (Climate control unit—airflow mode actuator: L—C) • Airflow mode actuator • Climate control unit: terminal voltage (P)
			BI-LEVEL	3.7	
			HEAT	2.9	
			HEAT/DEF	1.9	
			DEFROSTER	0.8	
M	Motor operation	Air intake actuator	Switched to RECIRCULATE	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: M—G, O—E, Q—C) • Air intake actuator
			Switched to FRESH	12	
N	Potentiometer input	Air mix actuator	Set temperature at MAX COLD	0.8	• Wiring harness: continuity, short circuit (Climate control unit—air mix actuator: N—C) • Air mix actuator • Climate control unit: terminal voltage (P)
			Set temperature at MAX HOT	4.5	
O	Motor operation	Air intake actuator	Switched to RECIRCULATE	12	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: M—G, O—E) • Air intake actuator
			Switched to FRESH	1.0 or less	
P	+5 V	• Air mix actuator • Airflow mode actuator • Solar radiation sensor	IG SW ON	5.2	• Wiring harness: short circuit (Climate control unit—air mix actuator, airflow mode actuator, solar radiation sensor: P—A, A, A) • Air mix actuator • Airflow mode actuator • Solar radiation sensor • Climate control unit: terminal voltage (K, V)
			IG SW LOCK	0	• Climate control unit replacement
Q	Motor operation	Air intake actuator	Switched to RECIRCULATE	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: Q—C, M—G) • Air intake actuator
			Switched to FRESH	12	
R	Passenger compartment temperature sensor input	Passenger compartment temperature sensor	Compared with temperature detected by passenger compartment temperature sensor	Refer to graph 2	• Wiring harness: continuity (Climate control unit—passenger compartment temperature sensor: R—D, U—B) • Wiring harness: short circuit (Climate control unit—passenger compartment temperature sensor: R—B) • Passenger compartment temperature sensor • Climate control unit: terminal voltage (K, V)
S	Solar radiation sensor input	Solar radiation sensor	Fluorescent light shined directly on the solar radiation sensor	4.0	• Wiring harness: continuity (Climate control unit—solar radiation sensor: S—B, P—A) • Climate control unit: terminal voltage (P) • Solar radiation sensor
			Blocking light to solar radiation sensor	1.0 or less	
T	Evaporator temperature sensor input	Evaporator temperature sensor	Compared with temperature detected by evaporator temperature sensor	Refer to graph 1	• Wiring harness: continuity (Climate control unit—evaporator temperature sensor: T—B, U—A) • Wiring harness: short circuit (Climate control unit—evaporator temperature sensor: T—B) • Evaporator temperature sensor • Climate control unit: terminal voltage (K, V)

Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
U	Sensor GND	• Passenger compartment temperature sensor • Evaporator temperature sensor • Air mix actuator • Airflow mode actuator	Under any condition	1.0 or less	• Climate control unit: terminal voltage (V)
V	GND	Body ground	Under any condition	1.0 or less	• Wiring harness: continuity (Climate control unit—GND: V—GND)
W	Signal	—	—	—	—
X	Signal	—	—	—	—

GRAPH 1 (EVAPORATOR TEMPERATURE SENSOR)



GRAPH 2 (PASSENGER COMPARTMENT TEMPERATURE SENSOR)

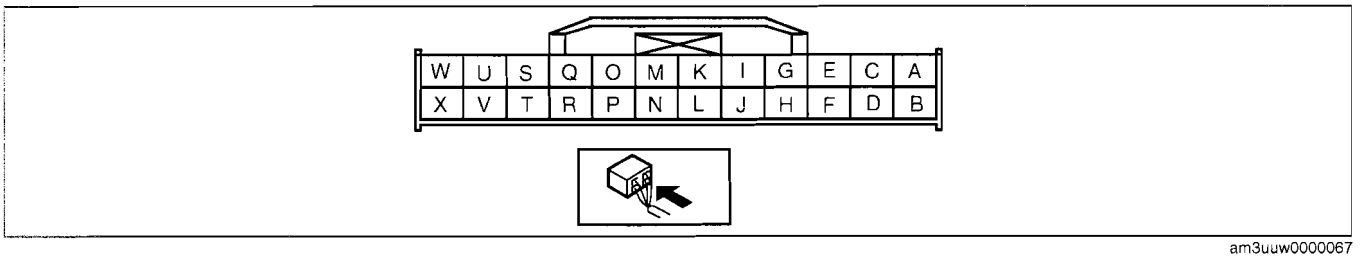


CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER]

id0740008022a2

1. Install the PJB.
2. Turn the ignition switch to the ON position.
3. Connect the negative (-) lead of the tester to body ground.
4. By inserting the positive (+) lead of the tester into each climate control unit terminal, measure the voltage according to the terminal voltage table.
   - If there is any malfunction, inspect the parts under "Inspection item (s)".
     — If the parts under "Inspection item (s)" are found to be normal, replace the climate control unit.

Terminal Voltage Table (Reference)

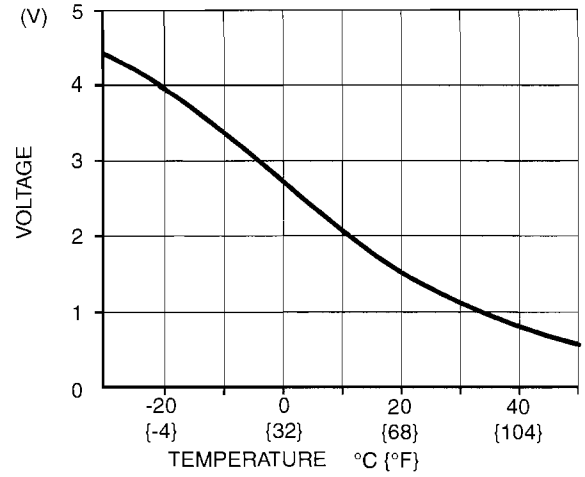


am3uuw0000067

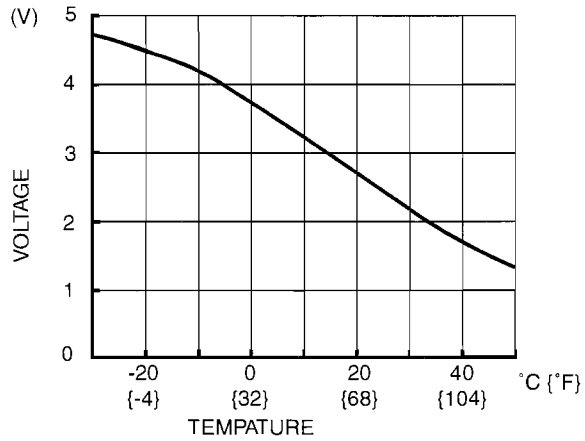
Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
A	—	—	—	—	—
B	—	—	—	—	—
C	—	—	—	—	—
D	B+	ROOM 15 A fuse	Under any condition	B+	• Wiring harness: continuity, short circuit (Climate control unit— fuse: D—ROOM 15 A) • ROOM 15 A fuse
E	—	—	—	—	—
F	IG2	A/C 10 A fuse	IG SW ON	B+	• Wiring harness: continuity, short circuit (Climate control unit— fuse: F—A/C 10 A) • A/C 10 A fuse
			IG SW LOCK	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit— fuse: F—A/C 10 A)
G	Ambient temperature sensor input	Ambient temperature sensor	Compared with temperature detected by ambient temperature sensor	Refer to graph 2	• Wiring harness: continuity (Climate control unit—ambient temperature sensor: G—A, L—B) • Wiring harness: short circuit (Climate control unit—ambient temperature sensor: G—A) • Ambient temperature sensor • Climate control unit: terminal voltage (F, J)
H	—	—	—	—	—
I	—	—	—	—	—
J	GND	Body ground	Under any condition	1.0 or less	• Wiring harness: continuity (Climate control unit—GND: J—GND)
K	—	—	—	—	—
L	Sensor GND	Evaporator temperature sensor	Under any condition	1.0 or less	• Climate control unit: terminal voltage (J)
M	A/C	PJB	A/C switch ON, fan switch at 1st	1.0 or less	• Wiring harness: continuity (Climate control unit—PJB: M—J-04 AF)
			A/C switch OFF	B+	• Wiring harness: continuity, short circuit (Climate control unit—PJB: M—J-04 AF) • PJB

Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
N	Evaporator temperature sensor input	Evaporator temperature sensor	Compared with temperature detected by evaporator temperature sensor	Refer to graph 1	• Wiring harness: continuity (Climate control unit—evaporator temperature sensor: N—B, L—A) • Wiring harness: short circuit (Climate control unit—evaporator temperature sensor: N—B) • Evaporator temperature sensor • Climate control unit: terminal voltage (F, J)
O	Motor operation	Air intake actuator	Switched to RECIRCULATE	12	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: S—G, O—E) • Air intake actuator
			Switched to FRESH	1.0 or less	
P	Rear window defroster switch indicator light	PJB	Rear window defroster switch ON	1.0 or less	• Wiring harness: continuity (Climate control unit—PJB: P—J-04 I) • PJB
			Rear window defroster switch OFF	5.0 or less	• Wiring harness: short circuit (Climate control unit—PJB: P—J-04 I) • PJB
Q	Motor operation	Air intake actuator	Switched to RECIRCULATE	12	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: Q—C, S—G) • Air intake actuator
			Switched to FRESH	1.0 or less	
R	Rear window defroster switch	PJB	Rear window defroster switch ON	10 or less	• Wiring harness: continuity, short circuit (Climate control unit—PJB: R—J-04 AD) • Climate control unit: terminal voltage (J) • PJB
			Rear window defroster switch OFF	10 or less	• Wiring harness: continuity, short circuit (Climate control unit—PJB: R—J-04 AD) • PJB
S	Motor operation	Air intake actuator	Switched to RECIRCULATE	1.0 or less	• Wiring harness: continuity, short circuit (Climate control unit—air intake actuator: S—G, O—E, Q—C) • Air intake actuator
			Switched to FRESH	12	
T	FAN signal	Fan switch	FAN switch ON	1.0 or less	• Wiring harness: continuity (Climate control unit—fan switch: T—A) • Fan switch
			FAN switch OFF	0	• Wiring harness: continuity (Climate control unit—fan switch: T—A) • Climate control unit: terminal voltage (F) • Fan switch
U	TNS signal	Panel light control switch	Headlight switch OFF	1.0 or less	• Wiring harness: continuity (Climate control unit—panel light control switch: U—F) • Panel light control switch • Climate control unit: terminal voltage (V)
			Headlight switch ON	12	• Wiring harness: short circuit (Climate control unit—panel light control switch: U—F)
V	TNS signal	PJB	Headlight switch OFF	1.0 or less	• Wiring harness: short circuit (Climate control unit—PJB: V—J-03 H) • PJB • Headlight switch
			Headlight switch ON	B+	• Wiring harness: continuity, short circuit (Climate control unit—PJB: V—J-03 H) • PJB • Headlight switch
W	—	—	—	—	—
X	—	—	—	—	—

GRAPH 1 (EVAPORATOR TEMPERATURE SENSOR)



GRAPH 2 (AMBIENT TEMPERATURE SENSOR)



FAN SWITCH INSPECTION

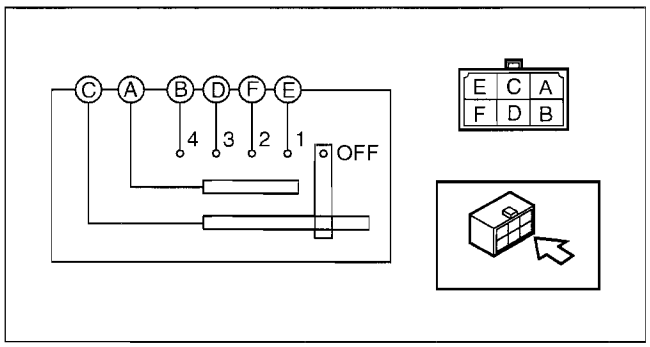
id074000801300

1. Remove the climate control unit.
2. Verify that the continuity between the fan switch terminals is as indicated in the table.
   - If there is any malfunction, replace the fan switch.

○—○ : Continuity

Switch position	Terminal					
	A	B	C	D	E	F
0						
1	○		○		○	
2	○		○			○
3	○		○	○		
4	○	○	○			

B3E0740W061



B3E0740W060

07-50 TECHNICAL DATA

HVAC TECHNICAL DATA

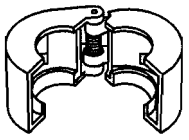
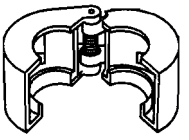
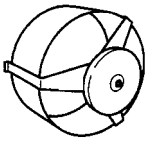
id075000800100

Item			Specification
REFRIGERANT SYSTEM			
Refrigerant	Type		R-134a
	Regular amount (approx. quantity)	(g {oz})	500 {17.65}
BASIC SYSTEM			
A/C compressor	Lubrication oil	Type	ATMOS GU10
		Sealed volume (approx. quantity) (ml {cc, fl oz})	155 {155, 5.24}
CONTROL SYSTEM			
A/C compressor	Magnetic clutch clearance	(mm {in})	0.30—0.50 {0.012—0.019}

07-60 SERVICE TOOLS

HEATER, VENTILATION AND AIR CONDITIONING (HVAC) SST

id076000800200

49 B061 014 Spring Lock Coupling Disconnect Tool 	49 G061 001 Spring Lock Coupling Disconnect Tool 	49 B061 015 Holder 

RESTRAINTS

08 SECTION

08-02 ON-BOARD DIAGNOSTIC

FOREWORD

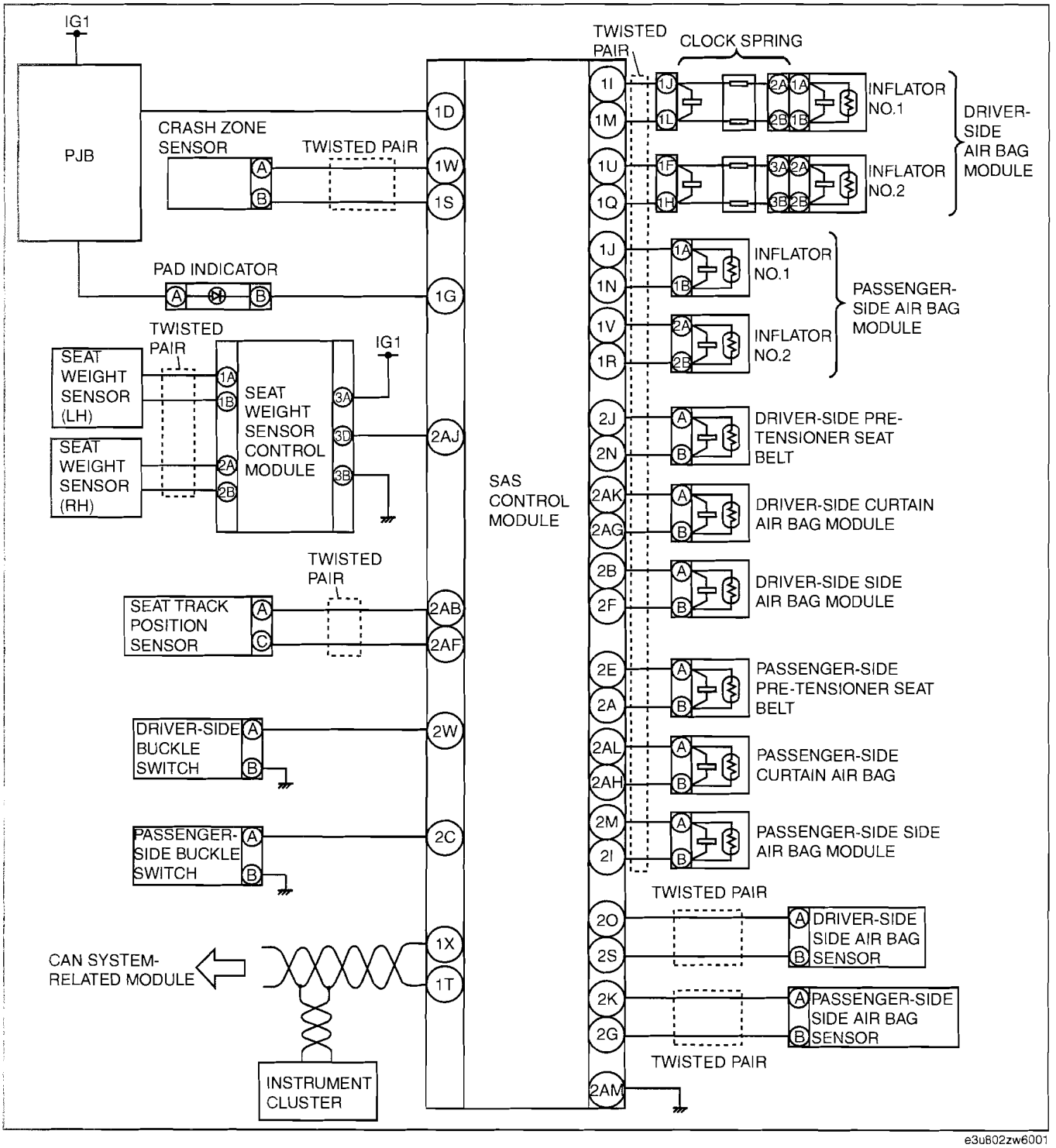
id080200800100

Outline

- The OBD (on-board diagnostic) system has the following functions:
  - — Malfunction detection function: Detects malfunctions in the air bag system and outputs DTCs.
  - — Data monitor function: Reads out specific input/output signals and the system status.
- Diagnostic DTCs can be read/cleared using the M-MDS.

AIR BAG SYSTEM WIRING DIAGRAM (ON-BOARD DIAGNOSTIC)

id080200808800

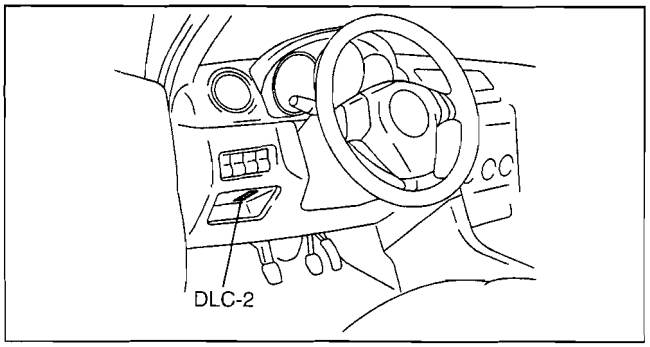


e3u802zw6001

DTC DISPLAY

id080200800400

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "Self Test".
     - — Select "Modules".
     - — Select "RCM".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "RCM".
     - — Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the SAS control module. (See 08-02-3 CLEARING DTC.)



am3uuw0000050

CLEARING DTC

id080200800500

1. After repairs have been made, retrieve DTCs.
2. Using the M-MDS, clear DTCs from the memory.
3. Perform the DTC inspection again and verify that no DTC is displayed.

DTC TABLE

id080200800600

08-02

DTC M-MDS display	System malfunction location	Page
B1013	Seat weight sensor calibration error	(See 08-02-8 DTC B1013.)
B1046	Driver-side curtain air bag module and other air bag module circuits short	(See 08-02-9 DTC B1046, B2773, B2774, B2775, B2776.)
B1047	Driver-side side air bag module and other air bag module circuits short	(See 08-02-10 DTC B1047, B1992, B1993, B1994, B1995.)
B1048	Passenger-side air bag module (inflator No.1) and other air bag module circuits short	(See 08-02-12 DTC B1048, B1925, B1933, B1935, B1938.)
B1049	Passenger-side pre-tensioner seat belt and other air bag module circuits short	(See 08-02-14 DTC B1049, B1881, B1882, B1883, B1886.)
B104B	Driver-side side air bag sensor and other sensor circuits short to power supply	(See 08-02-16 DTC B104B, B104E, B1051, U2017.)
B104C	Passenger-side side air bag sensor and other sensor circuits short to power supply	(See 08-02-18 DTC B104C, B104F, B1050, U2018.)
B104D	Crash zone sensor and other sensor circuits short to power supply	(See 08-02-20 DTC B104D, B2226, B2227, B2855.)
B104E	Driver-side side air bag sensor (internal circuit abnormal)	(See 08-02-16 DTC B104B, B104E, B1051, U2017.)
B104F	Passenger-side side air bag sensor (internal circuit abnormal)	(See 08-02-18 DTC B104C, B104F, B1050, U2018.)
B1050	Passenger-side side air bag sensor circuit open or short	
B1051	Driver-side side air bag sensor circuit open or short	(See 08-02-16 DTC B104B, B104E, B1051, U2017.)
B1052	Passenger-side front buckle switch and other sensor circuits short to power supply	(See 08-02-22 DTC B1051, U2017DTC B1052, B2436, B2437, B2438, B2439.)
B1053	Driver-side front buckle switch and other sensor circuits short to power supply	(See 08-02-24 DTC B1053, B2432, B2433, B2434, B2435.)
B1054	Driver-side pre-tensioner seat belt and other air bag module circuits short	(See 08-02-26 DTC B1054, B1877, B1878, B1879, B1885.)
B1055	Passenger-side side air bag module and other air bag module circuits short	(See 08-02-28 DTC B1055, B1996, B1997, B1998, B1999.)
B1056	Passenger-side curtain air bag module and other air bag module circuits short	(See 08-02-30 DTC B1056, B2777, B2778, B2779, B2780.)
B1057	Driver-side air bag module (inflator No.1) and other air bag module circuits short	(See 08-02-32 DTC B1057, B1916, B1932, B1934, B1936.)

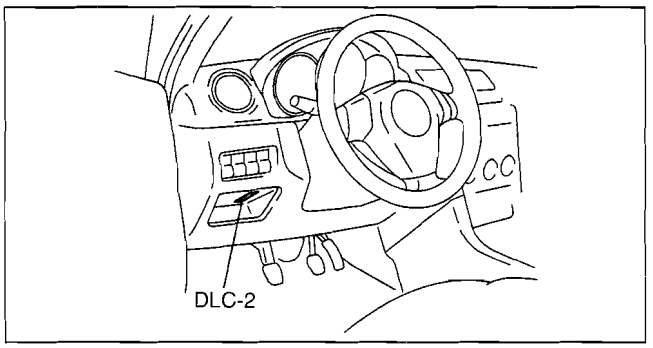
DTC M-MDS display	System malfunction location	Page
B1058	Driver-side air bag module (inflator No.2) and other air bag module circuits short	(See 08-02-34 DTC B1058, B2228, B2230, B2232, B2234.)
B1059	Passenger-side air bag module (inflator No.2) and other air bag module circuits short	(See 08-02-36 DTC B1059, B2229, B2231, B2233, B2235.)
B105A	SAS control module activation (deployment) control frequency error	(See 08-02-38 DTC B105A.)
B1231	SAS control module activation (deployment) control freeze	(See 08-02-38 DTC B1231.)
B1317	SAS control module power supply voltage increases (16.1 V or more)	(See 08-02-38 DTC B1317, B1318.)
B1318	SAS control module power supply voltage decreases (less than 9 V)	
B1342	SAS control module	(See 08-02-40 DTC B1342.)
B1877	Driver-side pre-tensioner seat belt circuit resistance high	(See 08-02-26 DTC B1054, B1877, B1878, B1879, B1885.)
B1878	Driver-side pre-tensioner seat belt circuit short to power supply	
B1879	Driver-side pre-tensioner seat belt circuit short to body ground	
B1881	Passenger-side pre-tensioner seat belt circuit resistance high	(See 08-02-14 DTC B1049, B1881, B1882, B1883, B1886.)
B1882	Passenger-side pre-tensioner seat belt circuit short to power supply	
B1883	Passenger-side pre-tensioner seat belt circuit short to body ground	
B1884	Passenger air bag deactivation (PAD) indicator circuit open or short to body ground	(See 08-02-41 DTC B1884, B1890.)
B1885	Driver-side pre-tensioner seat belt circuit resistance low	(See 08-02-26 DTC B1054, B1877, B1878, B1879, B1885.)
B1886	Passenger-side pre-tensioner seat belt circuit resistance low	(See 08-02-14 DTC B1049, B1881, B1882, B1883, B1886.)
B1890	Passenger air bag deactivation (PAD) indicator circuit short to power supply	(See 08-02-41 DTC B1884, B1890.)
B1916	Driver-side air bag module (inflator No.1) circuit short to power supply	(See 08-02-32 DTC B1057, B1916, B1932, B1934, B1936.)
B1925	Passenger-side air bag module (inflator No.1) circuit short to power supply	(See 08-02-12 DTC B1048, B1925, B1933, B1935, B1938.)
B1932	Driver-side air bag module (inflator No.1) circuit resistance high	(See 08-02-32 DTC B1057, B1916, B1932, B1934, B1936.)
B1933	Passenger-side air bag module (inflator No.1) circuit resistance high	(See 08-02-12 DTC B1048, B1925, B1933, B1935, B1938.)
B1934	Driver-side air bag module (inflator No.1) circuit resistance low	(See 08-02-32 DTC B1057, B1916, B1932, B1934, B1936.)
B1935	Passenger-side air bag module (inflator No.1) circuit resistance low	(See 08-02-12 DTC B1048, B1925, B1933, B1935, B1938.)
B1936	Driver-side air bag module (inflator No.1) circuit short to body ground	(See 08-02-32 DTC B1057, B1916, B1932, B1934, B1936.)
B1938	Passenger-side air bag module (inflator No.1) circuit short to body ground	(See 08-02-12 DTC B1048, B1925, B1933, B1935, B1938.)
B1992	Driver-side side air bag module circuit short to power supply	(See 08-02-10 DTC B1047, B1992, B1993, B1994, B1995.)
B1993	Driver-side side air bag module circuit short to body ground	
B1994	Driver-side side air bag module circuit resistance high	
B1995	Driver-side side air bag module circuit resistance low	
B1996	Passenger-side side air bag module circuit short to power supply	(See 08-02-28 DTC B1055, B1996, B1997, B1998, B1999.)
B1997	Passenger-side side air bag module circuit short to body ground	
B1998	Passenger-side side air bag module circuit resistance high	
B1999	Passenger-side side air bag module circuit resistance low	
B2226	Crash zone sensor (internal circuit abnormal)	(See 08-02-20 DTC B104D, B2226, B2227, B2855.)
B2227	Crash zone sensor (communication error)	
B2228	Driver-side air bag module (inflator No.2) circuit short to body ground	(See 08-02-34 DTC B1058, B2228, B2230, B2232, B2234.)
B2229	Passenger-side air bag module (inflator No.2) circuit short to body ground	(See 08-02-36 DTC B1059, B2229, B2231, B2233, B2235.)
B2230	Driver-side air bag module (inflator No.2) circuit short to power supply	(See 08-02-34 DTC B1058, B2228, B2230, B2232, B2234.)
B2231	Passenger-side air bag module (inflator No.2) circuit short to power supply	(See 08-02-36 DTC B1059, B2229, B2231, B2233, B2235.)

DTC M-MDS display	System malfunction location	Page
B2232	Driver-side air bag module (inflator No.2) circuit resistance high	(See 08-02-34 DTC B1058, B2228, B2230, B2232, B2234.)
B2233	Passenger-side air bag module (inflator No.2) circuit resistance high	(See 08-02-36 DTC B1059, B2229, B2231, B2233, B2235.)
B2234	Driver-side air bag module (inflator No.2) circuit resistance low	(See 08-02-34 DTC B1058, B2228, B2230, B2232, B2234.)
B2235	Passenger-side air bag module (inflator No.2) circuit resistance low	(See 08-02-36 DTC B1059, B2229, B2231, B2233, B2235.)
B2290	Passenger sensing system malfunction	(See 08-02-45 DTC B2290.)
B2432	Driver-side front buckle switch circuit open	(See 08-02-24 DTC B1053, B2432, B2433, B2434, B2435.)
B2433	Driver-side front buckle switch circuit open or short to power supply	
B2434	Driver-side front buckle switch circuit short to body ground	
B2435	Driver-side front buckle switch circuit resistance not within specification	
B2436	Passenger-side front buckle switch circuit open	(See 08-02-22 DTC B1051, U2017DTC B1052, B2436, B2437, B2438, B2439.)
B2437	Passenger-side front buckle switch circuit open or short to power supply	
B2438	Passenger-side front buckle switch circuit short to body ground	
B2439	Passenger-side front buckle switch circuit resistance not within specification	
B2477	Configuration error	(See 08-02-46 DTC B2477.)
B2773	Driver-side curtain air bag module circuit resistance low	(See 08-02-9 DTC B1046, B2773, B2774, B2775, B2776.)
B2774	Driver-side curtain air bag module circuit resistance high	
B2775	Driver-side curtain air bag module circuit short to body ground	
B2776	Driver-side curtain air bag module circuit short to power supply	
B2777	Passenger-side curtain air bag module circuit resistance low	(See 08-02-30 DTC B1056, B2777, B2778, B2779, B2780.)
B2778	Passenger-side curtain air bag module circuit resistance high	
B2779	Passenger-side curtain air bag module circuit short to body ground	
B2780	Passenger-side curtain air bag module circuit short to power supply	
B2855	Crash zone sensor circuit short	(See 08-02-20 DTC B104D, B2226, B2227, B2855.)
B2856	Crash zone sensor ID mismatch	(See 08-02-47 DTC B2856, B2886, B2887.)
B2886	Passenger-side side air bag sensor ID mismatch	
B2887	Driver-side side air bag sensor ID mismatch	
C1946	Seat track position sensor circuit open	(See 08-02-43 DTC C1946, C1947, C1948, C1981, C1982.)
C1947	Seat track position sensor circuit short to body ground	
C1948	Seat track position sensor circuit resistance not within specification	
C1981	Seat track position sensor circuit malfunction	
C1982	Seat track position sensor circuit short to power supply	
U2017	Driver-side side air bag sensor (communication error)	(See 08-02-16 DTC B104B, B104E, B1051, U2017.)
U2018	Passenger-side side air bag sensor (communication error)	(See 08-02-18 DTC B104C, B104F, B1050, U2018.)

PID/DATA MONITOR DISPLAY

id080200800700

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "DataLogger".
     - — Select "Modules".
     - — Select "RCM".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "RCM".
     - — Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000050

Note

- The PID data screen function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually.

PID/DATA MONITOR TABLE

id080200800800

PID name (definition)	Unit/Condition	Operation Condition (Reference)	Terminal
CCNT_RCM (Number of continuous DTCs)	—	• DTCs detected: 1—255 • No DTCs detected: 0	—
CRSH_RC (Number of collisions detected)	—	• Collisions detected: 1—255 • No collisions detected: 0	—
D_ABAGR2 (Driver-side air bag module (inflator No.2) resistance)	Ohm	Under any condition: 1.5—3.7 ohms	1U, 1Q
DABAGR (Driver-side air bag module (inflator No.1) resistance)	Ohm	Under any condition: 1.5—3.7 ohms	1I, 1M
DFCURTRES (Driver-side curtain air bag module resistance)	Ohm	Under any condition: 1.4—3.2 ohms	2AG, 2AK
DR_BUKL (Driver-side buckle switch status)	Buckled/ Unbuckled	• Driver-side buckle switch on: Buckled • Driver-side buckle switch off: Unbuckled	2W
DR_PTENS (Driver-side pre-tensioner seat belt resistance)	Ohm	Under any condition: 1.5—3.1 ohms	2J, 2N
DS_AB (Driver-side side air bag module resistance)	Ohm	Under any condition: 1.4—3.2 ohms	2B, 2F

PID name (definition)	Unit/Condition	Operation Condition (Reference)	Terminal
OCS_CAL_ST* (Seat weight sensor calibration status)	Started/ Calibrated/ FL_Other/ FL_Voltage/ FL_Weight/ FL_Timeout/ In Progress FL_OCS	• Seat weight sensor calibration start-up: Started • Seat weight sensor calibration completed normally: Calibrated • Seat weight sensor calibration command being sent: FL_Other • Voltage malfunction during seat weight sensor calibration: FL_Voltage • Weight error during seat weight sensor calibration: FL_Weight • Seat weight sensor calibration time limit passed: FL_Timeout • Seat weight sensor calibration being processed: In Progress • Seat weight sensor or Seat weight sensor control module malfunction: FL_OCS	2AJ
OCS_DTC_ST* (Seat weight sensor status)	Started/ Cleared/ In Progress/ Failed	Fault information cleared at seat weight sensor	2AJ
OCS_FLT (Passenger sensing system status)	MOD_FAIL/ COMM_FAIL/ CAL_FAIL/ LHS_FAIL/ RHS_FAIL/ BTS_FAIL/ No_Fault	• Seat weight sensor control module malfunction: MOD_FAIL • Seat weight sensor control module communication error: COMM_FAIL • Seat weight sensor calibration error: CAL_FAIL • Seat weight sensor (LH) malfunction: LHS_FAIL • Seat weight sensor (RH) malfunction: RHS_FAIL • Passenger-side front buckle switch malfunction: BTS_FAIL • Passenger sensing system is normal: No_Fault	2AJ
OCSSTAT* (Seat weight sensor status)	Empty/ Below Threshold/ Indeterminate/ Above Throshold/ Invalid	Occupant classification status determined by seat weight sensor	2AJ
P_ABAGR2 (Passenger-side air bag module (inflator No.2) resistance)	Ohm	Under any condition: 1.4—2.9 ohms	1R, 1V
PABAGR (Passenger-side air bag module (inflator No.1) resistance)	Ohm	Under any condition: 1.4—2.9 ohms	1J, 1N
PFCURTRES (Passenger-side curtain air bag module resistance)	Ohm	Under any condition: 1.4—3.2 ohms	2AH, 2AL
PS_AB (Passenger-side side air bag module resistance)	Ohm	Under any condition: 1.4—3.2 ohms	2I, 2M
PS_BUKL (Passenger-side buckle switch status)	Buckled/ UNbuckled	• Passenger-side buckle switch on: Buckled • Passenger-side buckle switch off: Unbuckled	2C
PS_PTENS (Passenger-side pre-tensioner seat belt resistance)	Ohm	Under any condition: 1.5—3.1 ohms	2A, 2E
PS_WEIGHT (Seat weight sensor measured weight of passenger)	Kg	Display of load (body weight) on passenger-side seat	2AJ
TRAK_SW (Seat track position sensor state)	Forward/ Rearward	• Front seat front position: Forward • Front seat rear position: Rearward	2AB, 2AF
VBATTRCM (SAS control module input voltage)	V	Ignition switch is at ON: B+	1D

* : Used during seat weight sensor calibration setting. Not necessary for diagnostic.

DTC B1013

id080200800900

DTC B1013	Seat weight sensor calibration error
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Calibration set value not within valid range.
POSSIBLE CAUSE	• Weight acting on passenger-side front seat during calibration • Improperly installed passenger-side front seat part at time of calibration • Deformed floor where attached to passenger-side front seat • Deformed passenger-side front seat under-bracket or frame • Seat weight sensor deformed or malfunction • Seat weight sensor control module malfunction • SAS control module malfunction

Diagnostic procedure

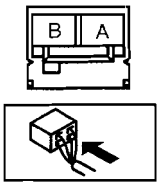
STEP	INSPECTION		ACTION
1	**INSPECT SEAT WEIGHT SENSOR** Properly install the passenger-side front seat. Inspect the seat weight sensor. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.) Is the seat weight sensor normal?	Yes	Replace the SAS control module. (See: 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT PASSENGER-SIDE FRONT SEAT** Turn the ignition switch to the LOCK position. Disconnect the negative battery cable and wait for **1 min or more**. Remove the passenger-side front seat and visually inspect for the following: — Seat under-bracket deformation — Seat frame deformation — Seat weight sensor deformation — Foreign objects stuck in seat Are any of the parts deformed or are any foreign objects stuck in the seat?	Yes	Replace any deformed parts or remove any foreign objects. • After replacement, perform seat weight sensor calibration and reperform the DTC inspection. If the DTC is displayed, go the next step. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)
		No	Go to the next step.
3	**INSPECT FLOOR** Visually inspect the installation parts of the passenger-side front seat for the following: — Abnormal floor deformation — Installation hole of passenger-side front seat is improperly positioned Is the floor normal?	Yes	Go to the next step.
		No	Repair floor deformation. • After repair, perform seat weight sensor calibration and reperform the DTC inspection. If the DTC is displayed even though the floor has been repaired, go the next step. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)
4	**INSPECT SEAT WEIGHT SENSOR CONTROL MODULE** Replace the seat weight sensor. After replacement, perform seat weight sensor calibration. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.) Reperform the DTC inspection. Is DTC B1013 indicated?	Yes	Replace the seat weight sensor control module. (See 08-10-12 SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION.) • After replacement, perform seat weight sensor calibration and reperform the DTC inspection. If the DTC is displayed even though the seat weight sensor control module has been replaced, replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1046, B2773, B2774, B2775, B2776

id080200808900

DTC	B1046	Driver-side curtain air bag module and other air bag module circuits short
	B2773	Driver-side curtain air bag module circuit resistance low
	B2774	Driver-side curtain air bag module circuit resistance high
	B2775	Driver-side curtain air bag module circuit short to body ground
	B2776	Driver-side curtain air bag module circuit short to power supply
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—3.2 ohms** detected in driver-side curtain air bag module circuit • Malfunction in wiring harness between driver-side curtain air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side curtain air bag module and SAS control module • Driver-side curtain air bag module malfunction • SAS control module malfunction

DRIVER-SIDE CURTAIN AIR BAG MODULE
WIRING HARNESS-SIDE CONNECTOR



08-02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DFCURTRES • Is the resistance of the driver-side curtain air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the driver-side curtain air bag module connector. • Is there any malfunction of the driver-side curtain air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.

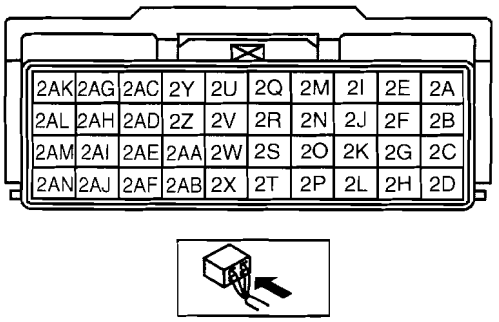
STEP	INSPECTION		ACTION
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to driver-side curtain air bag module connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1046, B2773, B2774, B2775 and/or B2776 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the driver-side curtain air bag module. (See 08-10-9 CURTAIN AIR BAG MODULE REMOVAL/ INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the driver-side curtain air bag module connector. • Are DTCs B1046, B2773, B2774, B2775 and/or B2776 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1047, B1992, B1993, B1994, B1995

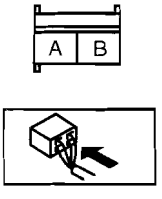
id080200809000

DTC	B1047	**Driver-side side air bag module and other air bag module circuits short**
	B1992	**Driver-side side air bag module circuit short to power supply**
	B1993	**Driver-side side air bag module circuit short to body ground**
	B1994	**Driver-side side air bag module circuit resistance high**
	B1995	**Driver-side side air bag module circuit resistance low**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—3.2 ohms** detected in driver-side side air bag module circuit • Malfunction in wiring harness between driver-side side air bag module and SAS control module	
POSSIBLE CAUSE	• Open or short circuit in wiring harness between driver-side side air bag module and SAS control module • Driver-side side air bag module malfunction • SAS control module malfunction	

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE SIDE AIR BAG MODULE** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DS_AB • Is the resistance of the driver-side side air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seats belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.** **(See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)** **(See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the driver-side side air bag module connector. • Is there any malfunction of the driver-side side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to driver-side side air bag module connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1047, B1992, B1993, B1994, and/or B1995 indicated?	Yes	Go to the next step.
		No	Replace the driver-side side air bag module. (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
4	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG MODULE AND SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Inspect the wiring harness between SAS control module terminal 2B and driver-side side air bag module terminal A, SAS control module terminal 2F and driver-side side air bag module terminal B for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.

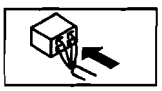
DTC B1048, B1925, B1933, B1935, B1938

id080200810600

DTC	B1048	**Passenger-side air bag module (inflator No.1) and other air bag module circuits short**
	B1925	**Passenger-side air bag module (inflator No.1) circuit short to power supply**
	B1933	**Passenger-side air bag module (inflator No.1) circuit resistance high**
	B1935	**Passenger-side air bag module (inflator No.1) circuit resistance low**
	B1938	**Passenger-side air bag module (inflator No.1) circuit short to body ground**
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—2.9 ohms** detected in passenger-side air bag module (inflator No.1) circuit • Malfunction in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module • Passenger-side air bag module (inflator No.1) malfunction • SAS control module malfunction

PASSENGER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR

(INFLATOR NO.1) (INFLATOR NO.2)



Diagnostic procedure

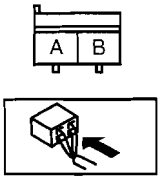
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1)** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PABAGR • Is the resistance of the passenger-side air bag module normal? — Resistance: **1.4—2.9 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.** **(See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)** **(See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Is there any malfunction of the passenger-side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to passenger-side air bag module (inflator No.1) connector terminals 1A and 1B, and passenger-side air bag module (inflator No.2) connector terminals 2A and 2B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1048, B1925, B1933, B1935 and/or B1938 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the passenger-side air bag module. (See 08-10-7 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the passenger-side air bag module connector. • Are DTCs B1048, B1925, B1933, B1935 and/or B1938 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1049, B1881, B1882, B1883, B1886

id080200810700

DTC	B1049	Passenger-side pre-tensioner seat belt and other air bag module circuits short
	B1881	Passenger-side pre-tensioner seat belt circuit resistance high
	B1882	Passenger-side pre-tensioner seat belt circuit short to power supply
	B1883	Passenger-side pre-tensioner seat belt circuit short to body ground
	B1886	Passenger-side pre-tensioner seat belt circuit resistance low
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.5—3.1 ohms** detected in passenger-side pre-tensioner seat belt circuit • Malfunction in wiring harness between passenger-side pre-tensioner seat belt and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side pre-tensioner seat belt and SAS control module • Passenger-side pre-tensioner seat belt malfunction • SAS control module malfunction

PASSENGER-SIDE PRE-TENSIONER
SEAT BELT WIRING
HARNESS-SIDE CONNECTOR



Diagnostic procedure

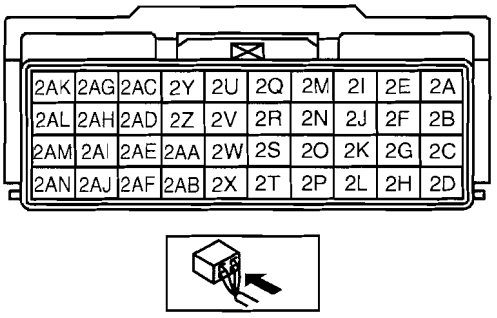
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PS_PTENS • Is the resistance of the passenger-side pre-tensioner seat belt normal? — Resistance: **1.5—3.1 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the B-pillar lower trim. • Disconnect the passenger-side pre-tensioner seat belt connector. • Is there any malfunction of the passenger-side pre-tensioner seat belt connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to passenger-side pre-tensioner seat belt connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1049, B1881, B1882, B1883, and/or B1886 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the passenger-side pre-tensioner seat belt. (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the passenger-side pre-tensioner seat belt connector. • Are DTCs B1049, B1881, B1882, B1883, and/or B1886 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B104B, B104E, B1051, U2017

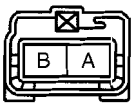
id080200810800

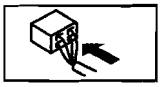
DTC	B104B	Driver-side side air bag sensor and other sensor circuits short to power supply
	B104E	Driver-side side air bag sensor circuit open or short
	B1051	Driver-side side air bag sensor (internal circuit abnormal)
	U2017	Driver-side side air bag sensor (communication error)
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in wiring harness between driver-side side air bag sensor and SAS control module • Malfunction in driver-side side air bag sensor circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side side air bag sensor and SAS control module • Driver-side side air bag sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE SIDE AIR BAG SENSOR WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE SIDE AIR BAG SENSOR** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DS_AB • Is the resistance of the driver-side side air bag sensor normal? — Resistance: **1.5—3.7 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.

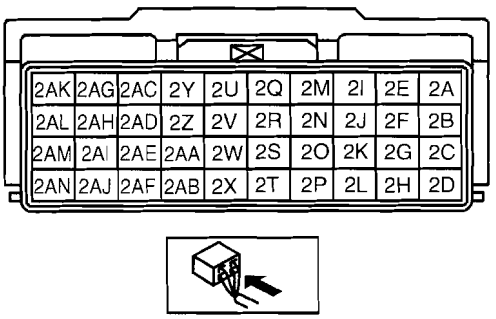
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Disconnect the driver-side side air bag sensor connector. • Connect the negative battery cable. • Inspect the wiring harnesses between SAS control module terminal 2O and driver-side side air bag sensor terminal A, SAS control module terminal 2S and driver-side side air bag sensor terminal B for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the driver-side side air bag sensor, then go to the next step. (See 08-10-14 SIDE AIR BAG SENSOR REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.
3	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the SAS control module connector. • Connect the driver-side side air bag sensor connector. • Are DTCs B104B, B104E, B1051 and/or U2017 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B104C, B104F, B1050, U2018

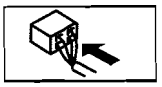
id080200810900

DTC	B104C	**Passenger-side side air bag sensor and other sensor circuits short to power supply**
	B104F	**Passenger-side side air bag sensor (internal circuit abnormal)**
	B1050	**Passenger-side side air bag sensor circuit open or short**
	U2018	**Passenger-side side air bag sensor (communication error)**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in wiring harness between passenger-side side air bag sensor and SAS control module • Malfunction in passenger-side side air bag sensor circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS control module • Passenger-side side air bag sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



PASSENGER-SIDE SIDE AIR BAG SENSOR WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE SIDE AIR BAG SENSOR** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PS_AB • Is the resistance of the passenger-side side air bag sensor normal? — Resistance: **1.5—3.7 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.

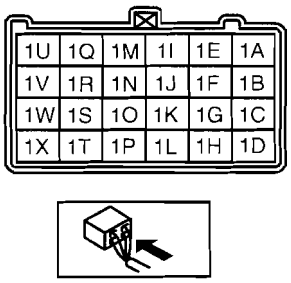
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Disconnect the passenger-side side air bag sensor connector. • Connect the negative battery cable. • Inspect the wiring harnesses between SAS control module terminal 2K and passenger-side side air bag sensor terminal A, SAS control module terminal 2G and passenger-side side air bag sensor terminal B for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the passenger-side side air bag sensor, then go to the next step. (See 08-10-14 SIDE AIR BAG SENSOR REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.
3	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the passenger-side side air bag sensor connector. • Are DTCs B104C, B104F, B1050 and/or U2018 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B104D, B2226, B2227, B2855

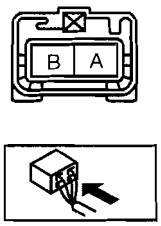
id080200811000

DTC	B104D	Crash zone sensor and other sensor circuits short to power supply
	B2226	Crash zone sensor (internal circuit abnormal)
	B2227	Crash zone sensor (communication error)
	B2855	Crash zone sensor circuit short
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in wiring harness between crash zone sensor and SAS control module • Malfunction in crash zone sensor circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between crash zone sensor and SAS control module • Crash zone sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



CRASH ZONE SENSOR WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CRASH ZONE SENSOR CONNECTOR** Warning • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the crash zone sensor connector. • Is there any malfunction of the crash zone sensor connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.

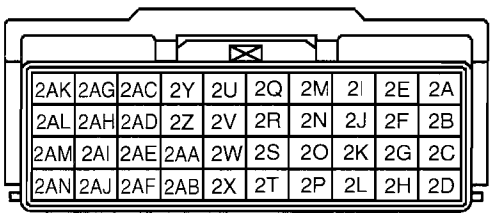
STEP	INSPECTION		ACTION
2	**INSPECT WIRING HARNESS BETWEEN CRASH ZONE SENSOR AND SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module SAS control module connector. • Disconnect the crash zone sensor connector. • Connect the negative battery cable. • Inspect the wiring harnesses between SAS control module terminal 1W and crash zone sensor terminal A, SAS control module terminal 1S and crash zone sensor terminal B for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the crash zone sensor, then go to the next step. (See 08-10-10 CRASH ZONE SENSOR REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.
3	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the SAS control module connector. • Connect the crash zone sensor connector. • Is DTC B104D, B2226, B2227 and/or B2855 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

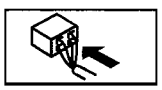
DTC B1051, U2017DTC B1052, B2436, B2437, B2438, B2439

id080200820100

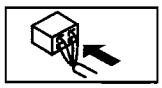
DTC	B1052	Passenger-side front buckle switch and other sensor circuits short to power supply
	B2436	Passenger-side front buckle switch circuit open
	B2437	Passenger-side front buckle switch circuit open or short to power supply
	B2438	Passenger-side front buckle switch circuit short to body ground
	B2439	Passenger-side front buckle switch circuit resistance not within specification
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in the wiring harness between the passenger-side front buckle switch and SAS control module • Malfunction in passenger-side front buckle switch circuit
POSSIBLE CAUSE		• Malfunction of connectors between passenger-side front buckle switch and SAS control module • Open or short circuit in wiring harness between passenger-side front buckle switch and SAS control module • Passenger-side front buckle switch malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR





PASSENGER-SIDE FRONT BUCKLE SWITCH WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

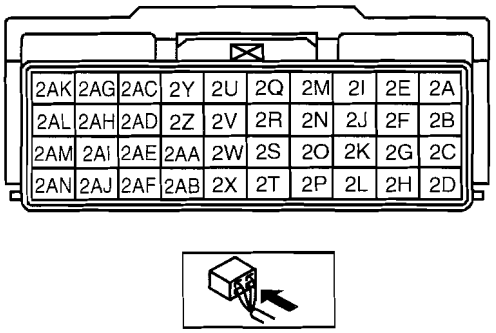
STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE BUCKLE SWITCH CIRCUIT** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PS_BUKL • Is the passenger-side front buckle switch normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE BUCKLE SWITCH AND GROUND** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the passenger-side front buckle switch connector. • Inspect the wiring harness between passenger-side front buckle switch terminal B and ground for the following: — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Go to the next step.
		No	Replace the wiring harness.
3	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE** • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Inspect the wiring harness between SAS control module terminal 2C and passenger-side front buckle switch terminal A for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the passenger-side front buckle. (See 08-11-6 FRONT BUCKLE REMOVAL/INSTALLATION.) If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Replace the wiring harness.

DTC B1053, B2432, B2433, B2434, B2435

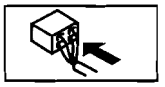
id080200811100

DTC	B1053	Driver-side front buckle switch and other sensor circuits short to power supply
	B2432	Driver-side front buckle switch circuit open
	B2433	Driver-side front buckle switch circuit open or short to power supply
	B2434	Driver-side front buckle switch circuit short to body ground
	B2435	Driver-side front buckle switch circuit resistance not within specification
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in driver-side front buckle switch circuit
POSSIBLE CAUSE		• Malfunction of connectors between driver-side front buckle switch and SAS control module • Open or short circuit in wiring harness between driver-side front buckle switch and SAS control module • Driver-side front buckle switch malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE FRONT BUCKLE SWITCH WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

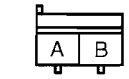
STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE BUCKLE SWITCH CIRCUIT** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DR_BUKL • Is the driver-side front buckle switch normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE BUCKLE SWITCH AND GROUND** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the driver-side front buckle switch connector. • Inspect the wiring harness between driver-side front buckle switch terminal B and ground for the following: — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Go to the next step.
		No	Replace the wiring harness.
3	**INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE** • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Inspect the wiring harness between SAS control module terminal 2W and driver-side front buckle switch terminal A for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the driver-side front buckle. (See 08-11-6 FRONT BUCKLE REMOVAL/INSTALLATION.) If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Replace the wiring harness.

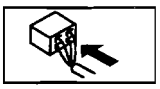
DTC B1054, B1877, B1878, B1879, B1885

id080200811200

DTC	B1054	Driver-side pre-tensioner seat belt and other air bag module circuits short
	B1877	Driver-side pre-tensioner seat belt circuit resistance high
	B1878	Driver-side pre-tensioner seat belt circuit short to power supply
	B1879	Driver-side pre-tensioner seat belt circuit short to body ground
	B1885	Driver-side pre-tensioner seat belt circuit resistance low
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.5—3.1 ohms** detected in driver-side pre-tensioner seat belt circuit • Malfunction in the wiring harness between driver-side pre-tensioner seat belt and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between driver-side pre-tensioner seat belt and SAS control module • Driver-side pre-tensioner seat belt malfunction • SAS control module malfunction

DRIVER-SIDE PRE-TENSIONER
SEAT BELT WIRING
HARNESS-SIDE CONNECTOR





Diagnostic procedure

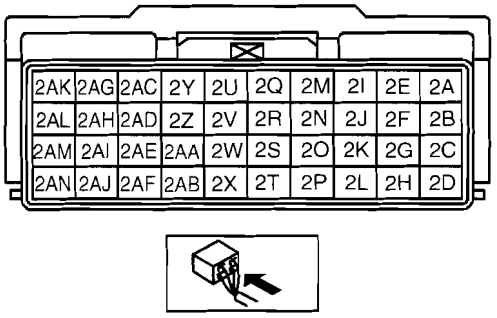
STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DR_PTENS • Is the driver-side pre-tensioner seat belt resistance normal? — Resistance: **1.5—3.1 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the B-pillar lower trim. • Disconnect the driver-side pre-tensioner seat belt connector. • Is there any malfunction of the driver-side pre-tensioner front buckle connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to driver-side pre-tensioner seat belt connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1054, B1877, B1878, B1879, and/or B1885 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the driver-side pre-tensioner seat belt. (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the driver-side pre-tensioner seat belt connector. • Are DTCs B1054, B1877, B1878, B1879, and/or B1885 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1055, B1996, B1997, B1998, B1999

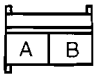
id080200809400

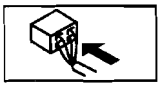
DTC	B1055	Passenger-side side air bag module and other air bag module circuits short
	B1996	Passenger-side side air bag module circuit short to power supply
	B1997	Passenger-side side air bag module circuit short to body ground
	B1998	Passenger-side side air bag module circuit resistance high
	B1999	Passenger-side side air bag module circuit resistance low
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—3.2 ohms** detected in passenger-side side air bag module circuit • Malfunction in wiring harness between passenger-side side air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side side air bag module and SAS control module • Passenger-side side air bag module malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



PASSENGER-SIDE SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PS_AB • Is the resistance of the passenger-side side air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.

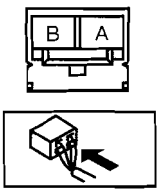
STEP	INSPECTION		ACTION
2	**INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the passenger-side side air bag module connector. • Is there any malfunction of the passenger-side side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to passenger-side side air bag module connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1055, B1996, B1997, B1998 and/or B1999 indicated?	Yes	Go to the next step.
		No	Replace the passenger-side side air bag module. (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
4	**INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG MODULE AND SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Inspect the wiring harness between SAS control module terminal 2M and passenger-side side air bag module terminal A, SAS control module terminal 2I and passenger-side side air bag module terminal B for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.

DTC B1056, B2777, B2778, B2779, B2780

id080200809500

DTC	B1056	**Passenger-side curtain air bag module and other air bag module circuits short**
	B2777	**Passenger-side curtain air bag module circuit resistance low**
	B2778	**Passenger-side curtain air bag module circuit resistance high**
	B2779	**Passenger-side curtain air bag module circuit short to body ground**
	B2780	**Passenger-side curtain air bag module circuit short to power supply**
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—3.2 ohms** detected in passenger-side curtain air bag module circuit • Malfunction in wiring harness between passenger-side curtain air bag module and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side curtain air bag module and SAS control module • Passenger-side curtain air bag module malfunction • SAS control module malfunction

PASSENGER-SIDE CURTAIN AIR BAG MODULE
WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

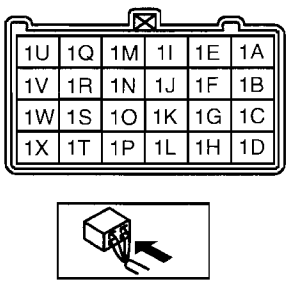
STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — PFCURTRES • Is the resistance of the passenger-side curtain air bag module normal? — Resistance: **1.4—3.2 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the passenger-side curtain air bag module connector. • Is there any malfunction of the passenger-side curtain air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to passenger-side curtain air bag module connector terminals A and B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1056, B2777, B2778, B2779 and/or B2780 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the passenger-side curtain air bag module. (See 08-10-9 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the passenger-side curtain air bag module connector. • Are DTCs B1056, B2777, B2778, B2779 and/or B2780 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1057, B1916, B1932, B1934, B1936

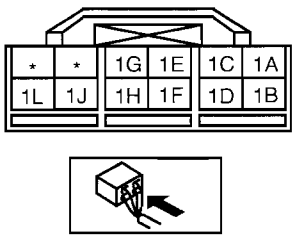
id080200811300

DTC	B1057	Driver-side air bag module (inflator No.1) and other air bag module circuits short
	B1916	Driver-side air bag module (inflator No.1) circuit short to power supply
	B1932	Driver-side air bag module (inflator No.1) circuit resistance high
	B1934	Driver-side air bag module (inflator No.1) circuit resistance low
	B1936	Driver-side air bag module (inflator No.1) circuit short to body ground
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.5—3.7 ohms** detected in driver-side air bag module (inflator No.1) circuit • Malfunction in wiring harness between driver-side air bag module (inflator No.1) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between clock spring and SAS control module • Clock spring malfunction • Driver-side air bag module (inflator No.1) malfunction • SAS control module malfunction

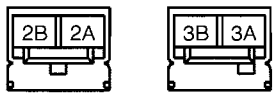
SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



CLOCK SPRING WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR (CLOCK SPRING) (INFLATOR NO.1) (INFLATOR NO.2)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1)** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — DABAGR • Is the resistance of the driver-side air bag module normal? — Resistance: **1.5—3.7 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
2	**INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the driver-side air bag module. • Is there any malfunction of the driver-side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to driver-side air bag module (inflator No.1) connector terminals 2A and 2B, and driver-side air bag module (inflator No.2) connector terminals 3A and 3B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1057, B1916, B1932, B1934 and/or B1936?	Yes	Go to the next step.
		No	Replace the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4	**INSPECT CLOCK SPRING** • Inspect the clock spring. (See 08-10-16 CLOCK SPRING INSPECTION.) • Is the clock spring normal?	Yes	Go to the next step.
		No	Replace the clock spring. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

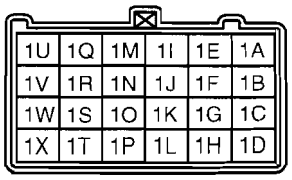
STEP	INSPECTION		ACTION
5	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Inspect the wiring harness between SAS control module terminal 1M and clock spring terminal 1L, SAS control module terminal 1I and clock spring terminal 1J for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.

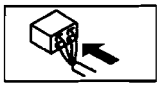
DTC B1058, B2228, B2230, B2232, B2234

id080200809600

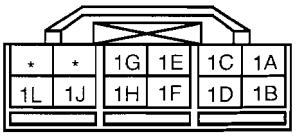
DTC	**B1058**	**Driver-side air bag module (inflator No.2) and other air bag module circuits short**
	B2228	**Driver-side air bag module (inflator No.2) circuit short to body ground**
	B2230	**Driver-side air bag module (inflator No.2) circuit short to power supply**
	B2232	**Driver-side air bag module (inflator No.2) circuit resistance high**
	B2234	**Driver-side air bag module (inflator No.2) circuit resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.5—3.7 ohms** detected in driver-side air bag module (inflator No.2) circuit • Malfunction in wiring harness between driver-side air bag module (inflator No.2) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between clock spring and SAS control module • Clock spring malfunction • Driver-side air bag module (inflator No.2) malfunction • SAS control module malfunction

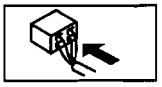
SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



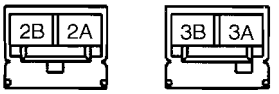


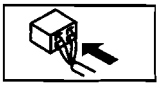
CLOCK SPRING WIRING HARNESS-SIDE CONNECTOR





DRIVER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR (CLOCK SPRING) (INFLATOR NO.1) (INFLATOR NO.2)





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2)** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — D_ABAGR2 • Is the resistance of the driver-side air bag module normal? — Resistance: **1.5—3.7 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.** **(See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)** **(See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Disconnect the driver-side air bag module connector. • Is there any malfunction of the driver-side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to driver-side air bag module (inflator No.1) connector terminals 2A and 2B, and driver-side air bag module (inflator No.2) connector terminals 3A and 3B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1058, B2228, B2230, B2232 and/or B2234 indicated?	Yes	Go to the next step.
		No	Replace the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4	**INSPECT CLOCK SPRING** • Inspect the clock spring. (See 08-10-16 CLOCK SPRING INSPECTION.) • Is the clock spring normal?	Yes	Go to the next step.
		No	Replace the clock spring. (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)

STEP	INSPECTION		ACTION
5	**INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the console. • Disconnect the SAS control module connector. • Inspect the wiring harness between SAS control module terminal 1Q and clock spring terminal 1H, SAS control module terminal 1U and clock spring terminal 1F for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.

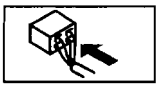
DTC B1059, B2229, B2231, B2233, B2235

id080200809700

DTC	B1059	**Passenger-side air bag module (inflator No.2) and other air bag module circuits short**
	B2229	**Passenger-side air bag module (inflator No.2) circuit short to body ground**
	B2231	**Passenger-side air bag module (inflator No.2) circuit short to power supply**
	B2233	**Passenger-side air bag module (inflator No.2) circuit resistance high**
	B2235	**Passenger-side air bag module (inflator No.2) circuit resistance low**
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Resistance other than **1.4—2.9 ohms** detected in passenger-side side air bag module circuit • Malfunction in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module
POSSIBLE CAUSE		• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module • Passenger-side air bag module (inflator No.2) malfunction • SAS control module malfunction

PASSENGER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR

(INFLATOR NO.1) (INFLATOR NO.2)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2)** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — P_ABAGR2 • Is the resistance of the passenger-side air bag module normal? — Resistance: **1.4—2.9 ohms**	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.** **(See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)** **(See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Is there any malfunction of the passenger-side air bag module connector?	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	**VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS** • Connect the leads of the **SST** (Fuel and thermometer checker) or apply **2-ohm** resistance to passenger-side air bag module (inflator No.1) connector terminals 1A and 1B, and passenger-side air bag module (inflator No.2) connector terminals 2A and 2B. • Set the resistance of the **SST** (Fuel and thermometer checker) to the **2-ohm** position. • Connect the negative battery cable. • Turn the ignition switch to the ON position. • Are DTCs B1059, B2229, B2231, B2233 and/or B2235 indicated?	Yes	Replace the air bag wiring harness, then go to the next step.
		No	Replace the passenger-side air bag module. (See 08-10-7 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
4	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Connect the passenger-side air bag module connector. • Are DTCs B1059, B2229, B2231, B2233 and/or B2235 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B105A

id080200811400

DTC B105A	SAS control module activation (deployment) control frequency error
DETECTION CONDITION	Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • The SAS control module has enabled the air bag module or pre-tensioner seat belt to operate (deploy) five times or more.
POSSIBLE CAUSE	• SAS control module malfunction

Diagnostic procedure

ACTION
Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)

DTC B1231

id080200801000

DTC B1231	SAS control module activation (deployment) control freeze
DETECTION CONDITION	Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • SAS control module determined collision

Diagnostic procedure

ACTION
Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)

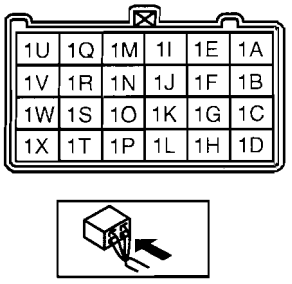
DTC B1317, B1318

id080200811500

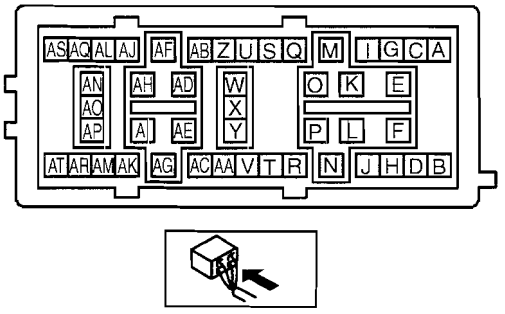
DTC	B1317	SAS control module power supply voltage increases (16.1 V or more)
	B1318	SAS control module power supply voltage decreases (less than 9 V)
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • When the SAS control module power supply voltage is not **within 9—16 V**.
POSSIBLE CAUSE		• Open or short circuit in wiring harness between battery and SAS control module • SAS 10 A fuse malfunction • Battery malfunction • SAS control module malfunction

DTC	B1317	SAS control module power supply voltage increases (16.1 V or more)
	B1318	SAS control module power supply voltage decreases (less than 9 V)

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE CONNTCTOR (J-03)



Diagnostic procedure

Step	Inspection		Action
1	**INSPECT FUSE** • Remove the SAS 10 A fuse. • Is the fuse normal?	Yes	Go to the next step.
		No	Replace the fuse.
2	**INSPECT BATTERY** • Measure the battery positive voltage. • Is the voltage **9 V—16 V**?	Yes	Go to the next step.
		No	The battery has a malfunction. Inspect the charge/discharge system.
3	**INSPECT WIRING HARNESS BETWEEN BATTERY AND PJB** • Turn the ignition switch to the ON position. • Measure the PJB terminal J-03 AP voltage. • Is the voltage **9 V—16 V**?	Yes	Install the fuse, then go to the next step.
		No	Repair the wiring harness between the PJB and battery.

Step	Inspection		Action
4	**INSPECT PJB** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connector. • Disconnect the driver and passenger-side curtain air bag module connector. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Measure the voltage at the PJB terminal J-03 AM. • Is the voltage **9 V—16 V**?	Yes	Go to the next step.
		No	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
5	**INSPECT WIRING HARNESS BETWEEN PJB AND SAS CONTROL MODULE** • Turn the ignition switch to the ON position. • Measure the SAS control module terminal 1D voltage. • Is the voltage **9 V—16 V**?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Repair the wiring harness between the PJB and SAS control module.

DTC B1342

id080200801100

DTC B1342	SAS control module
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in the SAS control module internal circuit
POSSIBLE CAUSE	• SAS control module malfunction

Diagnostic procedure

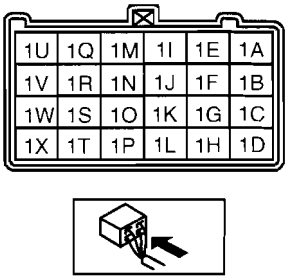
ACTION
Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)

DTC B1884, B1890

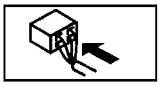
id080200801600

DTC	B1884	Passenger air bag deactivation (PAD) indicator circuit open or short to body ground
	B1890	Passenger air bag deactivation (PAD) indicator circuit short to power supply
DETECTION CONDITION		**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in PAD indicator circuit
POSSIBLE CAUSE		• Open or short circuit in wiring harness between PAD indicator and SAS control module • Open circuit in wiring harness between battery and PAD indicator • PAD indicator malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



PAD INDICATOR WIRING HARNESS-SIDE CONNECTOR



08-02

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT OPERATION OF PAD INDICATOR** • Turn the ignition switch to the ON position. • Does the PAD indicator illuminate?	Yes	Go to the next step.
		No	Go to Step 6.
2	**INSPECT FUSE** • Remove the SAS 10 A fuse. • Is the fuse normal?	Yes	Install the fuse, then go to the next step.
		No	Replace the fuse.
3	**INSPECT BATTERY** • Measure the battery positive voltage. • Is the voltage **9 V—16 V**?	Yes	Go to the next step.
		No	Battery is malfunctioning Inspect the charge/discharge system.
4	**INSPECT WIRING HARNESS BETWEEN BATTERY AND PAD INDICATOR** • Turn the ignition switch to the ON position. • Measure the PAD indicator terminal A voltage. • Is the voltage **9 V or more**?	Yes	Go to the next step.
		No	Repair the wiring harness between the battery and PAD indicator.
5	**INSPECT PAD INDICATOR** • Ground PAD indicator connector terminal B using a jumper wire. • Turn the ignition switch to the ON position. • Does the PAD indicator illuminate?	Yes	Go to the next step.
		No	Replace the air bag wiring harness.

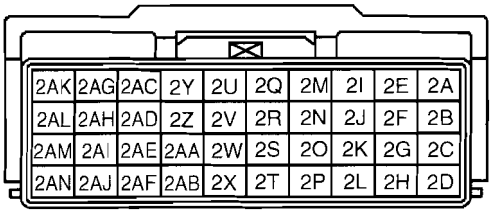
STEP	INSPECTION		ACTION
6	**INSPECT WIRING HARNESS BETWEEN PAD INDICATOR AND SAS CONTROL MODULE** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connector. • Disconnect the driver and passenger-side curtain air bag module connector. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Remove the console. • Disconnect the SAS control module connector. • Inspect the wiring harness between PAD indicator terminal B and SAS control module terminal 1G for the following: — Short to ground — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Replace the air bag wiring harness.

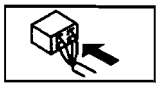
DTC C1946, C1947, C1948, C1981, C1982

id080200820200

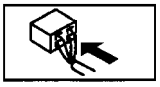
DTC	C1946	Seat track position sensor circuit open
	C1947	Seat track position sensor circuit short to body ground
	C1948	Seat track position sensor circuit resistance not within specification
	C1981	Seat track position sensor circuit malfunction
	C1982	Seat track position sensor circuit short to power supply
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Malfunction in seat track position sensor circuit.
POSSIBLE CAUSE		• Malfunction of connector between seat track position sensor and SAS control module. • Open or short circuit in wiring harness between seat track position sensor and SAS control module. • Seat track position sensor malfunction • SAS control module malfunction

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR





SEAT TRACK POSITION SENSOR WIRING HARNESS-SIDE CONNECTOR



08-02

Diagnostic procedure

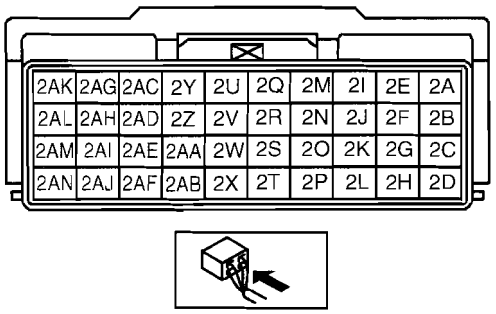
STEP	INSPECTION		ACTION
1	**INSPECT SEAT TRACK POSITION SENSOR CIRCUIT** • Using the M-MDS, verify the following PID/DATA monitor. (See 08-02-6 PID/DATA MONITOR TABLE.) — TRAK_SW • Is the seat track position sensor circuit normal?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	Go to next step.
2	**INSPECT WIRING HARNESS BETWEEN SEAT TRACK POSITION SENSOR AND SAS CONTROL MODULE** **Warning** • **Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.** **(See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)** **(See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more**. • Remove the column cover. • Disconnect the clock spring connector. • Remove the glove compartment. • Disconnect the passenger-side air bag module connector. • Disconnect the driver and passenger-side front seat connectors. • Disconnect the driver and passenger-side curtain air bag module connectors. • Remove the B-pillar lower trim. • Disconnect the driver and passenger-side pre-tensioner seat belt connectors. • Disconnect the seat track position sensor connector • Inspect the wiring harness between SAS control module terminal and seat track position sensor terminals for short to ground, short to power supply, and open circuit: — 2AB—A — 2AF—C • Is the wiring harness normal?	Yes	Replace the seat track position sensor, then go to next step.
		No	Replace wiring harness, then go to next step.
3	**INSPECT SAS CONTROL MODULE** • Connect the SAS control module connector. • Connect the clock spring connector. • Connect the passenger-side air bag module connector. • Connect the driver-and passenger-side front seat connectors. • Connect the driver-and passenger-side curtain air bag module connectors. • Connect the driver-and passenger-side pre tensioner seat belt connectors. • Connect the seat track position sensor connector. • Are DTCs C1946, C1947, C1948, C1981 and/or C1982 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2290

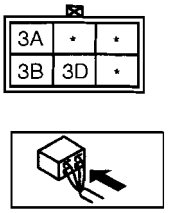
id080200802300

DTC B2290	Passenger sensing system malfunction
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • Passenger sensing system circuit malfunction
POSSIBLE CAUSE	• Seat weight sensor calibration not properly set • Communication error between SAS control module and seat weight sensor control module • Seat weight sensor control module internal malfunction • LH or RH seat weight sensor malfunction

SAS CONTROL MODULE
HARNESS SIDE CONNECTOR



SWS CONTROL MODULE
HARNESS SIDE CONNECTOR



STEP	INSPECTION		ACTION
1	**INSPECT SEAT WEIGHT SENSOR CONTROL MODULE CONNECTOR** **Warning** • **Handling the air bag system components improperly can accidentally operate (deploy) the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)** Turn the ignition switch to the LOCK position. Disconnect the negative battery cable and wait for **1 min or more**. Disconnect the seat weight sensor control module connector. Is there any malfunction of the seat weight sensor control module connector?	Yes	Repair or replace the wiring harness. After replacement, reperform the DTC inspection and verify that no DTCs are displayed.
		No	Go to the next step.
2	**INSPECTION WIRING HARNESS** Disconnect the SAS control module connector. Verify continuity in the following wiring harnesses: — Between SAS control module terminal 2AJ and seat weight sensor control module terminal 3D — Between the battery and seat weight sensor control module terminal 3A — Between seat weight sensor control module terminal 3B and body ground Is the continuity normal?	Yes	Go to the next step.
		No	If there is any malfunction in the wiring harnesses, repair or replace the applicable wiring harness. After replacement, reperform the DTC inspection and verify that no DTCs are displayed.

STEP	INSPECTION		ACTION
3	**INSPECT PASSENGER SENSING SYSTEM** Connect the seat weight sensor control module connector. Connect the SAS control module. Connect the negative battery cable. Verify the following PIDs using the M-MDS. (See 08-02-6 PID/DATA MONITOR DISPLAY.) — OCS_FLT Is NO_Fail displayed?	Yes	Go to the next step.
		No	Replace the following parts according to the M-MDS screen: • If MOD_Fail or COMM_Fail is displayed: — Seat weight sensor control module (See 08-10-12 SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION.) • If SNS_Fail_L is displayed: — Seat weight sensor (LH) (See: 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.) • If SNS_Fail_R is displayed: — Seat weight sensor (RH) (See 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.) • If SNS_Fail is displayed: — Seat weight sensor (See 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.) • If CAL_Fail is displayed: — Perform seat weight sensor calibration (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)
4	**INSPECT SAS CONTROL MODULE** Reperform the DTC inspection. Is DTC B2290 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2477

id080200810500

DTC B2477	**Configuration error**
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • SAS control module configuration has not been performed correctly.
POSSIBLE CAUSE	• SAS control module configuration error • SAS control module malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT SAS CONTROL MODULE** • Using the M-MDS, perform SAS control module configuration. • Is DTC B2477 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2856, B2886, B2887

id080200811600

DTC	B2856	Crash zone sensor ID mismatch
	B2886	Passenger-side side air bag sensor ID mismatch
	B2887	Driver-side side air bag sensor ID mismatch
DETECTION CONDITION		Warning • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • The SAS control module detects an error of impact magnitude set in the sensor, which occurs due to installation mismatch of the crash zone sensor or side air bag sensors.
POSSIBLE CAUSE		• Crash zone sensor misinstalled with wrong sensor • Driver-side side air bag sensor misinstalled with wrong sensor • Passenger-side side air bag sensor misinstalled with wrong sensor

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT EACH SENSOR FOR INSTALLATION POSITION** • Verify that the crash zone sensor or side air bag sensor is installed in the correct position. • Is each sensor installed correctly?	Yes	Go to the next step.
		No	Install the each sensor correctly, then go to the next step.
2	**INSPECT SAS CONTROL MODULE** • Turn the ignition switch to the LOCK position. • Disconnect the negative battery cable and wait for **1 min or more.** • Are DTCs B2856, B2886 and/or B2887 indicated?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	DTC troubleshooting completed.

08-03 SYMPTOM TROUBLESHOOTING

TROUBLESHOOTING INDEX

id080300802000

- Use the chart below verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	Troubleshooting item	Description	Page
1	Air bag system warning light does not illuminate.	Malfunction in air bag system warning light circuit.	(See 08-03-1 NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE.)
2	Air bag system warning light illuminates constantly.	Malfunction in air bag system warning light circuit.	(See 08-03-2 NO.2 AIR BAG SYSTEM WARNING LIGHT ILLUMINATES CONSTANTLY.)

NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE

id080300800200

1	**Air bag system warning light does not illuminate.**
DETECTION CONDITION	Malfunction in air bag system warning light circuit
POSSIBLE CAUSE	• SAS control module malfunction • Instrument cluster malfunction • CAN communication network malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**CONFIRM DTC U0151 USING M-MDS** • Retrieve DTC from the instrument cluster. • Is DTC U0151 retrieved?	Yes	Network communication for related systems has a malfunction. Repair or replace if necessary.
		No	Inspect the instrument cluster. If the instrument cluster is normal, go to the next step. If the instrument cluster has a malfunction, replace the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
2	**CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING M-MDS** • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER CONFIGURATION.)
		No	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)

NO.2 AIR BAG SYSTEM WARNING LIGHT ILLUMINATES CONSTANTLY

id080300800300

2	**Air bag system warning light illuminates constantly.**
DETECTION CONDITION	Malfunction in air bag system warning light circuit
POSSIBLE CAUSE	• SAS control module malfunction • Instrument cluster (circuit board) malfunction • CAN communication network malfunction

Diagnostic Procedure

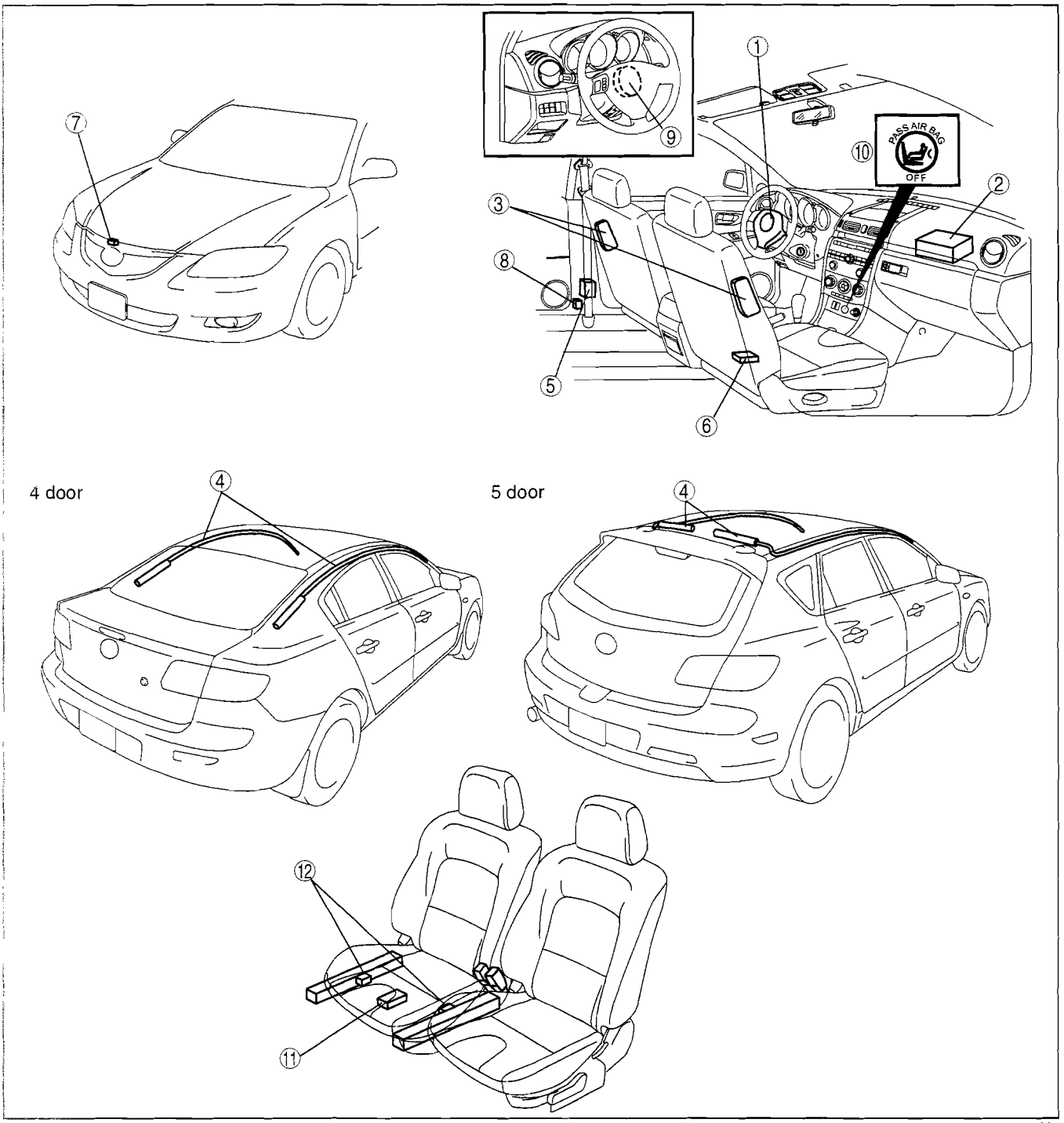
- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION		ACTION
1	**VERIFY DTC IN SAS CONTROL MODULE MEMORY** • Have DTCs been record in the memory?	Yes	Perform inspection using appropriate DTC. (See 08-02-3 DTC TABLE.)
		No	Inspect the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION) If the instrument cluster is normal, go to the next step. If the instrument cluster has a malfunction, replace the instrument cluster.
*2	**INSPECT AIR BAG SYSTEM WARNING LIGHT CIRCUIT IN INSTRUMENT CLUSTER** • Turn the ignition switch to the ON position. • Does air bag system warning light go out?	Yes	Inspect the connectors and terminals of the SAS control module. Repair or replace if necessary.
		No	Go to the next step.
*3	**INSPECT SAS CONTROL MODULE** • Disconnect the SAS control module connector. • Turn the ignition switch to the ON position. • Verify the voltage at terminal 1D. • Is the voltage **B+**?	Yes	Replace the SAS control module. (See 08-10-11 SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
		No	Inspect the battery power supply circuit and ground circuit.

08-10 AIR BAG SYSTEM

LOCATION INDEX

id081000800100



e3u810zw6001

1	Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.) (See 08-10-17 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.)
2	Passenger-side air bag module (See 08-10-7 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.) (See 08-10-17 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.)

3	Side air bag module (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.) (See 08-10-17 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.)
4	Curtain air bag module (See 08-10-9 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION.) (See 08-10-17 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.)

5	Pre-tensioner seat belt (See 08-10-17 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.)
6	SAS control module (See 08-10-11 SAS CONTROL MODULE REMOVAL/INSTALLATION.)
7	Crash zone sensor (See 08-10-10 CRASH ZONE SENSOR REMOVAL/INSTALLATION.)
8	Side air bag sensor (See 08-10-14 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION.)

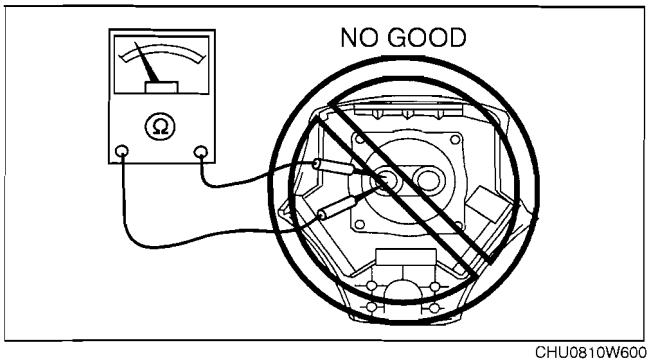
9	Clock spring (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.) (See 08-10-16 CLOCK SPRING INSPECTION.) (See 08-10-15 CLOCK SPRING ADJUSTMENT.)
10	Passenger air bag deactivation (PAD) indicator
11	Seat weight sensor control module (See 08-10-12 SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION.)
12	Seat weight sensor (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.) (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)

AIR BAG SYSTEM SERVICE WARNINGS

id081000800200

Air Bag Module Inspection

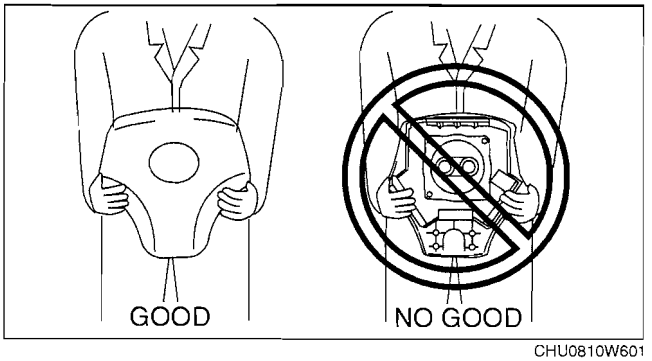
- **Inspecting an air bag module using a tester can operate (deploy) the air bag module, which may cause serious injury. Do not use a tester to inspect an air bag module. Always use the on-board diagnostic function to diagnose the air bag module for malfunctions.**



CHU0810W600

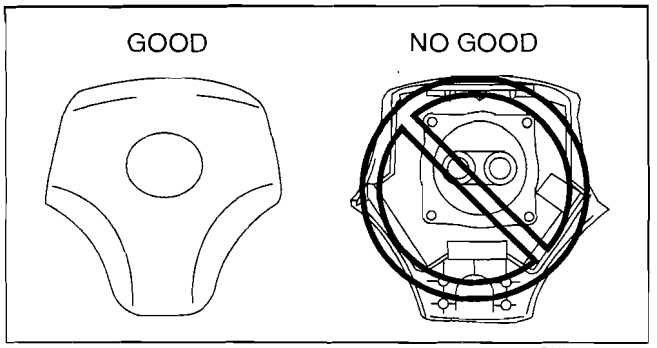
Air Bag Module Handling

- **Before removing the air bag module or disconnecting the air bag module connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.**
- **Handling a live (undeployed) air bag module that is pointed toward your body could result in serious injury if the air bag module were to accidentally operate (deploy). When carrying a live (undeployed) air bag module, point the deployment surface away from your body to lessen the chance of injury in case it operates (deploys).**



CHU0810W601

- A live (undeployed) air bag module placed with its deployment surface to ground is dangerous. If the air bag module were to accidentally operate (deploy), it could cause serious injury. Always place a live (undeployed) air bag module with its deployment surface up.



CHU0810W602

Side Air Bag Module Handling
- Before removing the side air bag module or disconnecting the side air bag module connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- When a side air bag module operates (deploys) due to a collision, the interior of the seat back (pad, frame, trim) may become damaged. If a side air bag does not operate (deploy) normally from a seat back that has been reused, a serious accident may result. After a side air bag has operated (deployed), always replace both the side air bag module and the seat back (pad, frame, trim) with new parts. After servicing, verify that the seat operates normally and that the wiring harness is not caught.

Seat Weight Sensor Handling
- The passenger-side seat and the seat weight sensor may become deformed or otherwise damaged due to operation (deployment) of the front or side air bag in an accident. This may cause the passenger sensing function to operate improperly and result in a serious accident. Always replace the passenger seat and seat weight sensor with new ones after the front or side air bags have operated (deployed). After servicing, verify that the seat operates normally and that the wiring harness is not caught. If the collision is not hard enough to cause the front or side air bags to operate (deploy), inspect the seat weight sensor and replace it if there is any malfunction.

SAS Control Module Handling
- Removing the SAS control module or disconnecting the SAS control module connector with the ignition switch at the ON position can activate the sensor in the SAS control module and operate (deploy) the air bags and pre-tensioner seat belts, which may cause serious injury. Before removing the SAS control module or disconnecting the SAS control module connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- Connecting the SAS control module connector with the SAS control module not securely fixed to the vehicle is dangerous. The sensor in the SAS control module could send an electrical signal to the air bag modules and pre-tensioner seat belts. This will operate (deploy) the air bags and pre-tensioner seat belts, which may result in serious injury. Therefore, before connecting the connector, securely fix the SAS control module to the vehicle.
- Because a sensor is built into the SAS control module, once the air bags and pre-tensioner seat belts have operated (deployed) due to a collision or other causes, the SAS control module must be replaced with a new one even if the used one does not have any visible external damage or deformation. The used SAS control module may have been damaged internally, which may cause improper operation. If the SAS control module is reused, the air bags and pre-tensioner seat belts may not operate (deploy) normally, which could result in a serious accident. Always replace the SAS control module with a new one. The SAS control module cannot be bench-checked or self-checked.

Crash Zone Sensor Handling
- Removing the crash zone sensor or disconnecting the crash zone sensor connector with the ignition switch at the ON position can activate the crash zone sensor and operate (deploy) the air bags and pre-tensioner seat belts, which may cause serious injury. Before removing the crash zone sensor or disconnecting the crash zone sensor connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- If the crash zone sensor is subjected to shock or the sensor is disassembled, the air bags and pre-tensioner seat belts may accidentally operate (deploy) and cause injury, or the system may fail to operate normally and cause a serious accident. Do not subject the crash zone sensor to shock or disassemble the sensor.

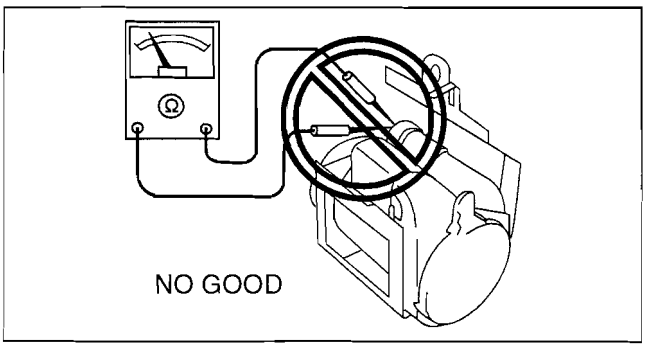
- Because a sensor is built into the crash zone sensor, once the air bags and pre-tensioner seat belts have operated (deployed) due to a collision or other causes, the crash zone sensor must be replaced with a new one even if the used one does not have any visible external damage or deformation. If the crash zone sensor is reused, the air bags and pre-tensioner seat belts may not operate (deploy) normally, which could result in a serious accident. Always replace the crash zone sensor with a new one. The crash zone sensor cannot be bench-checked or self-checked.

Side Air Bag Sensor Handling

- Removing the side air bag sensor or disconnecting the side air bag sensor connector with the ignition switch at the ON position can activate the side air bag sensor and operate (deploy) the side air bag, which may cause serious injury. Before removing the side air bag sensor or disconnecting the side air bag sensor connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- If the side air bag sensor is subjected to shock or the sensor is disassembled, the side air bag may accidentally operate (deploy) and cause injury, or the system may fail to operate normally and cause a serious accident. Do not subject the side air bag sensor to shock or disassemble the sensor.
- Because a sensor is built into the side air bag sensor, once the air bag has operated (deployed) due to a collision or other causes, the side air bag sensor must be replaced with a new one even if the used one does not have any visible external damage or deformation. If the side air bag sensor is reused, the side air bag may not operate (deploy) normally, which could result in a serious accident. Always replace the side air bag sensor with a new one. The side air bag sensor cannot be bench-checked or self-checked.

Pre-tensioner Seat Belt Inspection

- Inspecting a pre-tensioner seat belt using a tester can operate (deploy) the pre-tensioner seat belt, which may cause serious injury. Do not use a tester to inspect a pre-tensioner seat belt. Always use the on-board diagnostic function to diagnose the pre-tensioner seat belt for malfunctions.



e3u810zw6004

AIR BAG SYSTEM SERVICE CAUTIONS

id081000800300

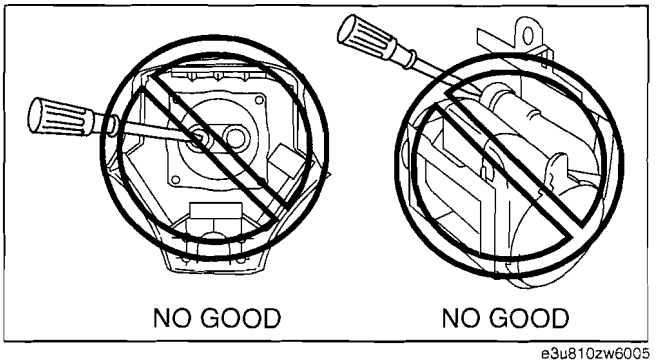
Air Bag System Component Disassembly

- Disassembling the air bag system components could cause it to not operate (deploy) normally. Never disassemble any air bag system components.

CHU0810W604

Air Bag Module, Pre-tensioner Seat Belt Handling

- Oil, grease, or water on the air bag modules may cause the air bags and pre-tensioner seat belts to fail to operate (deploy) in an accident. Never allow oil, grease, or water to get on the air bag modules or pre-tensioner seat belts.
- Inserting a screwdriver or similar object into the connector of an air bag module or a pre-tensioner seat belt may damage the connector and cause the air bag module or the pre-tensioner seat belt to operate (deploy) improperly, which may cause serious injury. Never insert any foreign objects into the air bag module or seat belt connectors.



e3u810zw6005

Seat Weight Sensor Handling

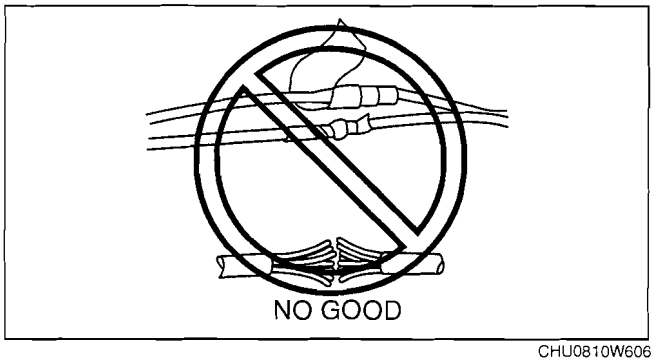
- The seat weight sensor has a built-in strain gauge which may operate improperly if the sensor is dropped by itself or when installed to the seat. If it is dropped, replace the seat weight sensor with a new one.
- Oil, grease, or water on the seat weight sensor may cause the system to operate (deploy) improperly. Never allow oil, grease, or water to get on the seat weight sensor.
- Foreign material in the seat weight sensor components may cause the system to operate (deploy) improperly. Always make sure that no foreign material can get into the seat weight sensor.
- Disassembling the seat weight sensor, or tightening any of the nuts and bolts installed to the sensor body may cause it to operate (deploy) improperly. Never disassemble the seat weight sensor or tighten any of the nuts or bolts installed to the body of the sensor.

Air Bag Module. Pre-tensioner Seat Belt Reuse

- Even if an air bag module or a pre-tensioner seat belt does not operate (deploy) in a collision and does not have any external signs of damage, it may have been damaged internally, which may cause improper operation. Before reusing a live (undeployed) air bag module and the pre-tensioner seat belts, always use the on-board diagnostic to diagnose the air bag module and the pre-tensioner seat belts to verify that they have no malfunction.

Air Bag Wiring Harness Repair

- Incorrectly repairing an air bag wiring harness can accidentally operate (deploy) the air bag module and pre-tensioner seat belts. If a problem is found in the air bag wiring harness, always replace the wiring harness with a new one.



CHU0810W606

DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

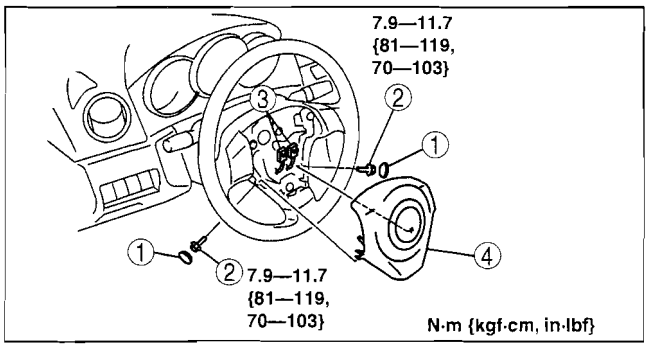
id081000801300

Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Connector (See 08-10-7 Connector Removal Note.)
4	Driver-side air bag module

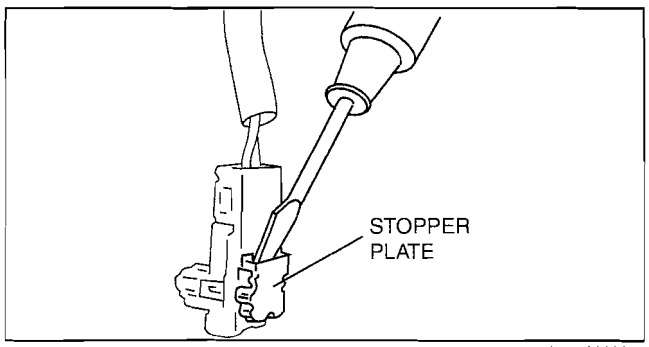


c3u0810w204

4. Install in the reverse order of removal.
5. Turn the ignition switch to the ON position.
6. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector stopper plate.
2. Disconnect the connector.



am3uuw0000081

PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

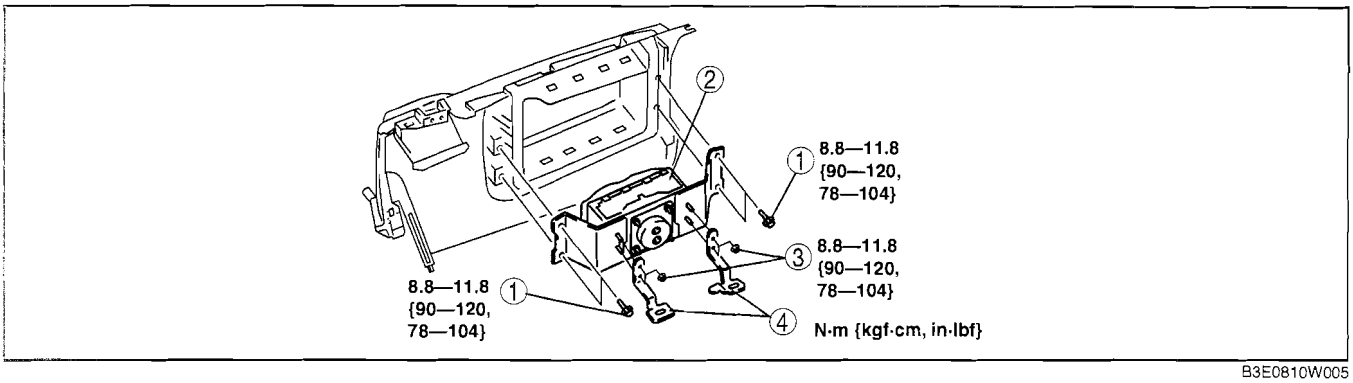
id081000801900

Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**
- **Due to the adoption of 2-step deployment control in the passenger-side air bag module, depending on the impact force, it is possible that inflator No.2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflators No.1 and 2.**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Remove the following parts:
   (1) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (5) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (6) Dashboard center panel (without car-navigation system) (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
   (7) LCD unit (with car-navigation system) (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.)
   (8) Dashboard garnish (See 09-17-13 DASHBOARD GARNISH REMOVAL/INSTALLATION.)

4. Remove in the order indicated in the table.



B3E0810W005

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

SIDE AIR BAG MODULE REMOVAL/INSTALLATION

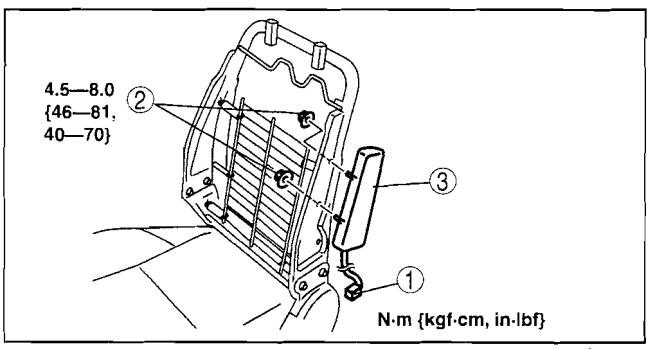
id081000800800

Warning

- **Handling the air bag module improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**
- **If the side air bag module is installed with debris in the seat back, the foreign material may be scattered when the side air bag module operates (deploys), causing injury. Verify that there is no foreign material in the seat back before installing the side air bag module.**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Remove the front seat. (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
4. Remove the seat cushion frame. (See 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.)
5. Partially peel back the seat back trim.
6. Partially peel back the seat back pad.
7. Remove in the order indicated in the table.

1	Connector (See 08-10-9 Connector Removal Note.)
2	Nut
3	Side air bag module

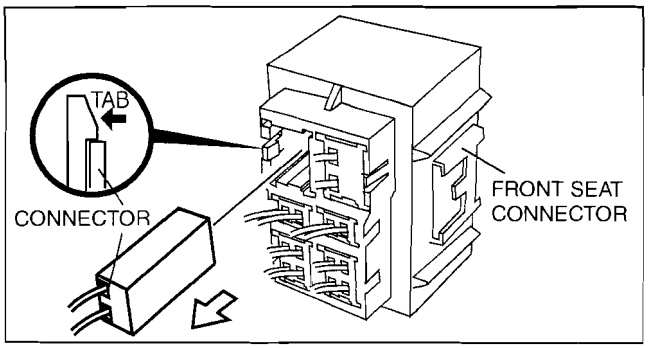


am3uuw0000081

8. Install in the reverse order of removal.
9. Turn the ignition switch to the ON position.
10. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
    - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

Connector Removal Note

1. Detach the tab as shown in the figure and remove the connector from the front seat connector.



am3uuw0000081

CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION

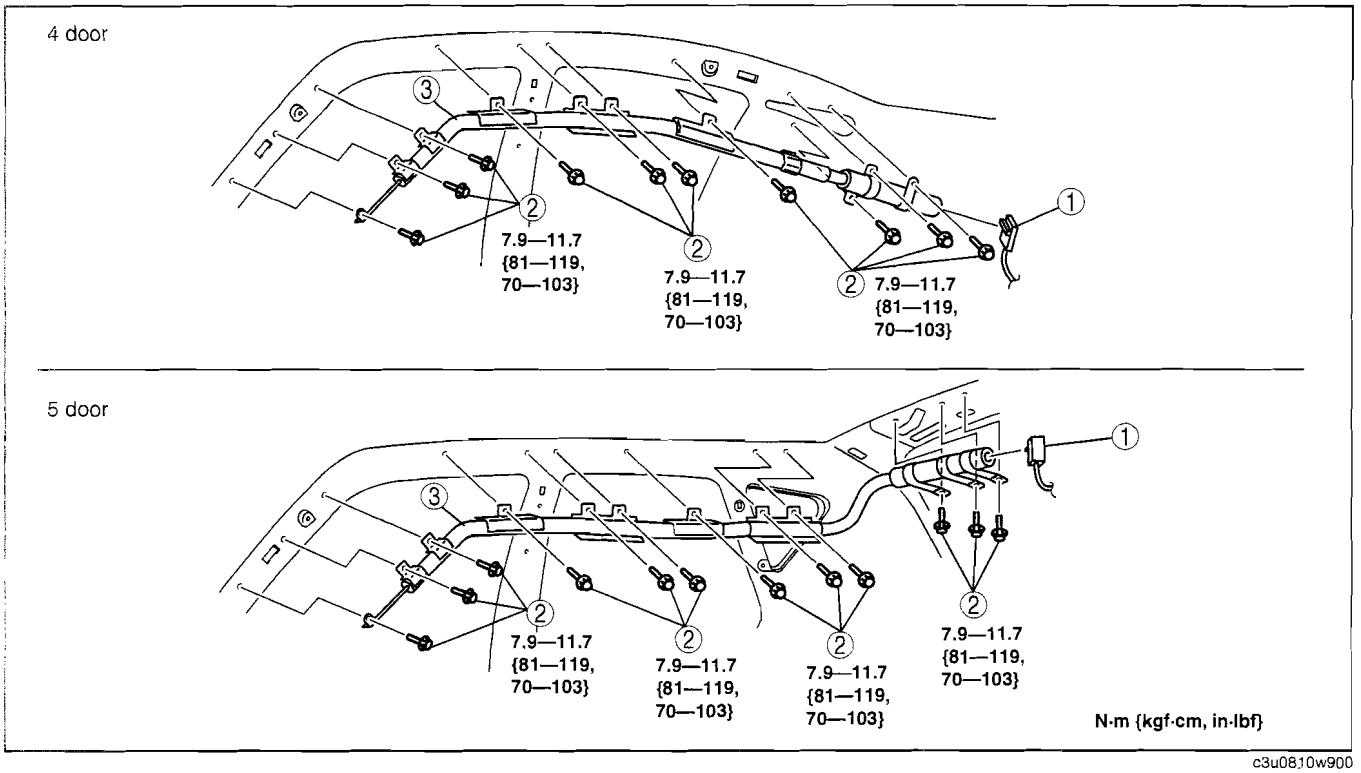
id081000800900

Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more.**
3. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (6) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Interior light (See 09-18-24 INTERIOR LIGHT REMOVAL/INSTALLATION.)
   (14)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (15)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (16)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (17)Head impact pad (See 09-17-16 HEAD IMPACT PAD REMOVAL/INSTALLATION.)

4. Remove in the order indicated in the table.



c3u08;10w900

1	Connector
2	Bolt
3	Curtain air bag module

5. Install in the reverse order of removal.
6. When the ignition switch is turned to the ON position verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

CRASH ZONE SENSOR REMOVAL/INSTALLATION

id081000800500

Warning

- **Handling the crash zone sensor improperly can accidentally deploy the air bags and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the crash zone sensor. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

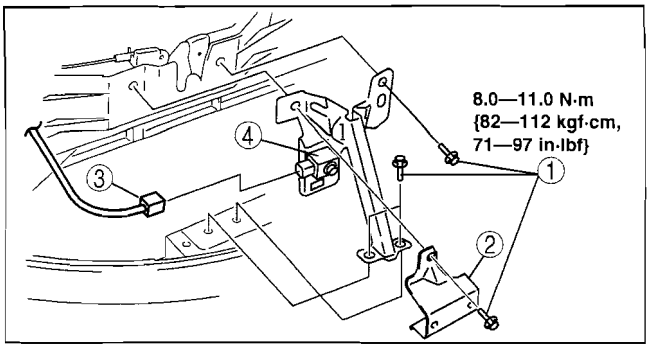
Note

- The hood latch is attached together with the crash zone sensor and is therefore removed when the sensor is removed. This may cause incorrect positioning of the hood after installation of the sensor. To ensure proper positioning of the hood, place alignment marks on the hood latch and shroud panel before removing the crash zone sensor.

1. Place alignment marks on the hood latch and shroud panel.
2. Turn the ignition switch to the LOCK position.
3. Disconnect the negative battery cable and wait for **1 min or more**.

4. Remove in the order indicated in the table.

1	Bolt
2	Cover
3	Connector
4	Crash zone sensor (See 08-10-11 Crash Zone Sensor Installation Note.)



am3uuw0000081

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

Crash Zone Sensor Installation Note

1. Align the alignment marks on the hood latch and shroud panel made prior to removal, and install the crash zone sensor.
2. Refer to "HOOD ADJUSTMENT" and verify that the gap and height difference between the hood and body are within the specifications. Adjust the hood if necessary. (See 09-10-4 HOOD ADJUSTMENT.)

SAS CONTROL MODULE REMOVAL/INSTALLATION

id081000801400

Warning

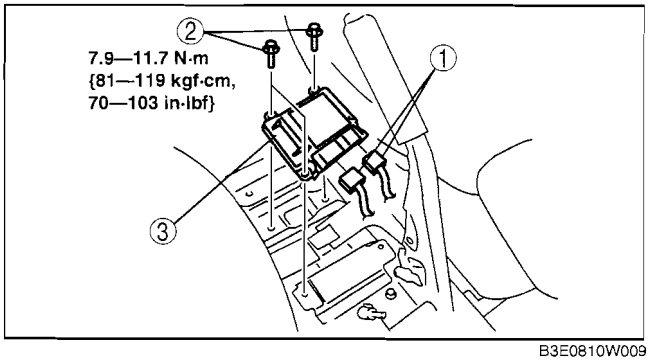
- **Handling the SAS control module improperly can accidentally deploy the air bag modules and pretensioner seat belt, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

Caution

- **Handling the SAS control module improperly can accidentally deploy the air bag modules and pretensioner seat belt, which may seriously injure you. If configuration is not completed before removing the SAS control module, DTC B2477 will be displayed.**

1. Perform SAS control module configuration when replacing it. (See 08-10-12 SAS CONTROL MODULE CONFIGURATIONS.)
2. Turn the ignition switch to the LOCK position.
3. Disconnect the negative battery cable and wait for **1 min or more**.
4. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	SAS control module



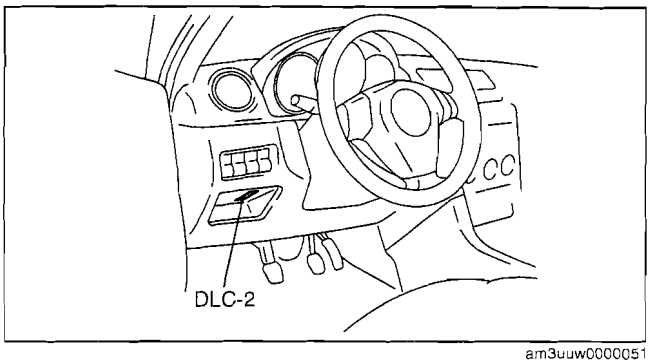
B3E0810W009

6. Install in the reverse order of removal.
7. Turn the ignition switch to the ON position.
   - If the SAS control module is replaced, turn the ignition switch to the ON position for **20 s or more** after completing the configuration. (See 08-10-12 SAS CONTROL MODULE CONFIGURATION.)
8. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

SAS CONTROL MODULE CONFIGURATION

id081000801500

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Module Programming".
   - When using the PDS (Pocket PC)
     1. Select "Programming".
     2. Select "Module Programming".
3. Then, select items from the screen menu in the following order.
   1. Select "Programmable Module Installation".
   2. Select "RCM".
4. Perform the configuration according to the directions on the screen.



am3uuw0000051

SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION

id081000801600

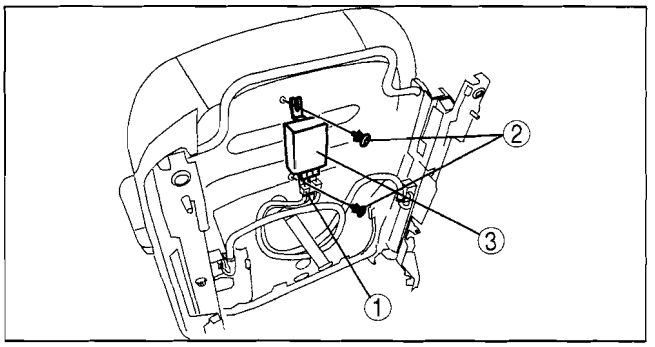
Caution

- **When the seat weight sensor control module is replaced with a new one, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Remove the front passenger's seat. (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Connector
2	Fasner
3	Seat weight sensor control module

5. Install in the reverse order of removal.



c3u0810w520

SEAT WEIGHT SENSOR CALIBRATION

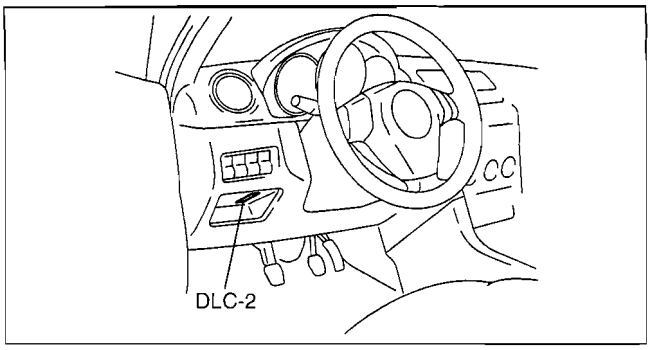
id081000801700

Caution

- **If any of the following work is performed, perform the seat weight sensor calibration using the M-MDS.**
  - **— Replacement with a new seat weight sensor**
  - **— Replacement with a new seat weight sensor control module**
  - **— Replacement with new passenger-side seat parts**
  - **— Disassembly of the passenger-side seat**
- **If any of the following work is performed, perform the seat weight sensor inspection using the M-MDS. (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)**
  - **— Removal of the passenger-side seat**
  - **— Loosening and retightening of passenger's seat fixing bolts**
  - **— Or, the vehicle is involved in a collision**

1. Have two **20 kg {44 lb}** weights ready to use.

2. Connect the M-MDS to the DLC-2 connector.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Body".
     2. Select "Restraints".
   - When using the PDS (Pocket PC)
     1. Select "All Tests and Calibrations".
4. Then, select item from the screen menu in the following order.
   1. Select "Passenger Seat Weight Sensor ReZero".
5. Perform calibration following the procedures on the M-MDS screen.



am3uuw0000051

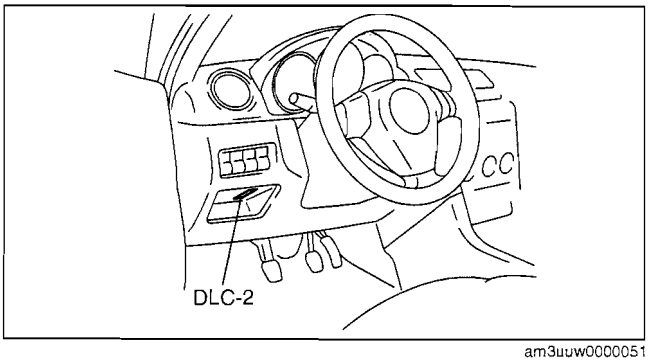
Note
- When "Lightly pat the passenger seat cushion" is displayed on the M-MDS screen, lightly pat horizontally approx. five times on the headrest or upper side of the seat back trim of the passenger-side front seat.

SEAT WEIGHT SENSOR INSPECTION

id081000801800

Caution
- **If any of the following work is performed, perform the seat weight sensor inspection using the M-MDS.**
  - **— Removal of the passenger-side seat**
  - **— Loosening and retightening of passenger's seat fixing bolts**
  - **— Or, the vehicle is involved in a collision**
- **If any of the following work is performed, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**
  - **— Replacement with a new seat weight sensor**
  - **— Replacement with a new seat weight sensor control module**
  - **— Replacement with new passenger-side seat parts**
  - **— Disassembly of the passenger-side seat**

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "Body".
     2. Select "Restraints".
   - When using the PDS (Pocket PC)
     1. Select "All Tests and Calibrations".
3. Then, select item from the screen menu in the following order.
   1. Select "Passenger Seat Weight Sensor ReZero".
4. Perform inspection following the procedures on the M-MDS screen.



am3uuw0000051

SIDE AIR BAG SENSOR REMOVAL/INSTALLATION

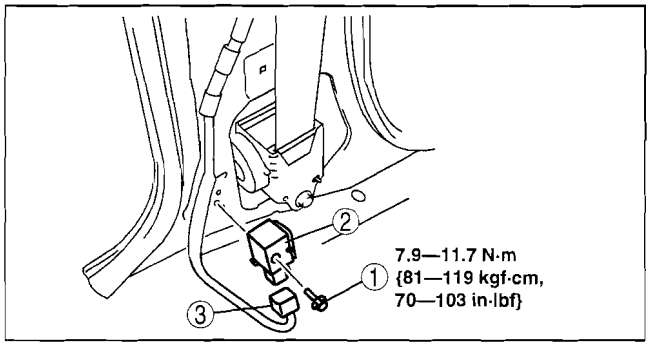
id081000804200

Warning

- **Handling the side air bag sensor improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the side air bag sensor. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Remove the front scuff plate. (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the rear scuff plate. (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
5. Remove the B-pillar lower trim. (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
6. Remove in the order indicated in the table.

1	Bolt
2	Side air bag sensor
3	Connector



B3E0810W010

7. Install in the reverse order of removal.
8. Turn the ignition switch to the ON position and hold for **5 s or more**.

Caution

- **When turning the ignition switch to the ON position after replacing the side air bag sensor, performing the following operations will cancel the sensor code over-write, which could cause the air bags to fail to operate (deploy).**
  - **— The ignition switch is turned to the LOCK position before the ignition switch is held in the ON position for 5 s or more.**
  - **— The engine is started.**
- **If the above operations are performed and the sensor code over-write is canceled, it will be necessary to replace the sensor again.**

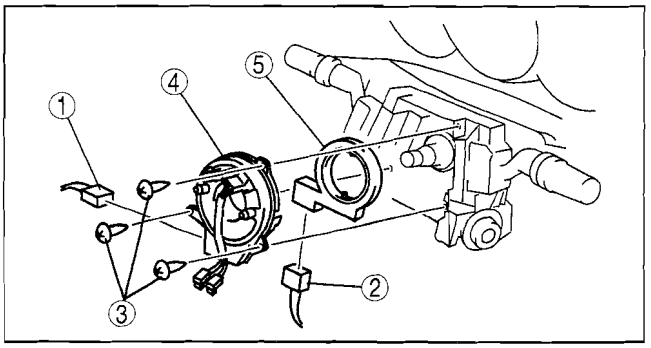
9. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

CLOCK SPRING REMOVAL/INSTALLATION

id081000802000

1. Disconnect the negative battery cable and wait for **1 min or more**.
2. Remove the following parts:
   (1) Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
   (2) Steering wheel (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
   (3) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION
   (4) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (5) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (6) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Clock spring connector
2	Steering angle sensor connector (With steering angle sensor)
3	Screw
4	Clock spring (See 08-10-15 Clock Spring Installation Note.)
5	Steering angle sensor (With steering angle sensor) (See 08-10-15 Steering Angle Sensor Removal Note.)



am3uuw0000081

4. Install in the reverse order of removal.
5. Turn the ignition switch to the ON position.

6. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
   - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

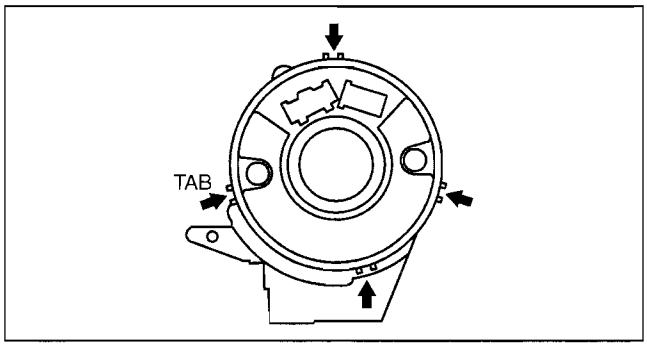
Clock Spring Installation Note

Caution
- **If the clock spring is not adjusted, the spring wire in the clock spring could over-wind and break when the steering wheel is turned. Always adjust the clock spring after installing it.**

1. Adjust the clock spring after installing it. (See 08-10-15 CLOCK SPRING ADJUSTMENT.)

Steering Angle Sensor Removal Note

1. Detach the tabs at the four locations shown in the figure and remove the steering angle sensor.



am3uuw0000082

CLOCK SPRING ADJUSTMENT

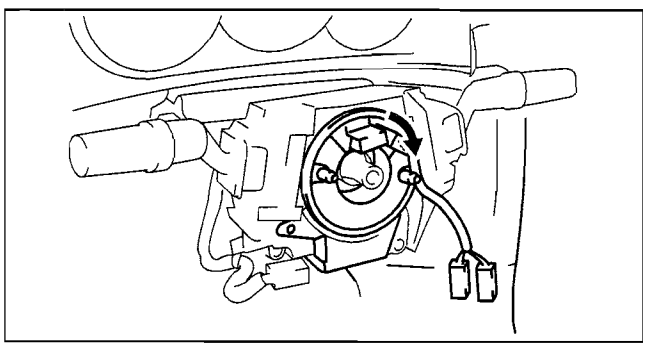
id081000802100

Note
- The adjustment procedure is also specified on the caution label of the clock spring.

1. Set the front tires straight-ahead.

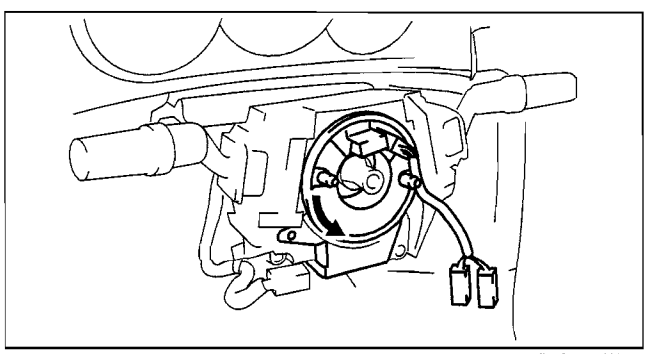
Caution
- **The clock spring will break if over-wound. Do not forcibly turn the clock spring.**

2. Turn the clock spring clockwise until it stops.



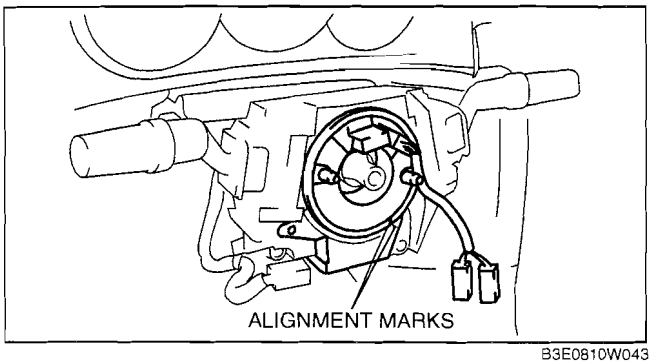
B3E0810W013

3. From the stopped position, turn the clock spring counterclockwise **2 3/4 turns**.



B3E0810W014

4. Align the marks.



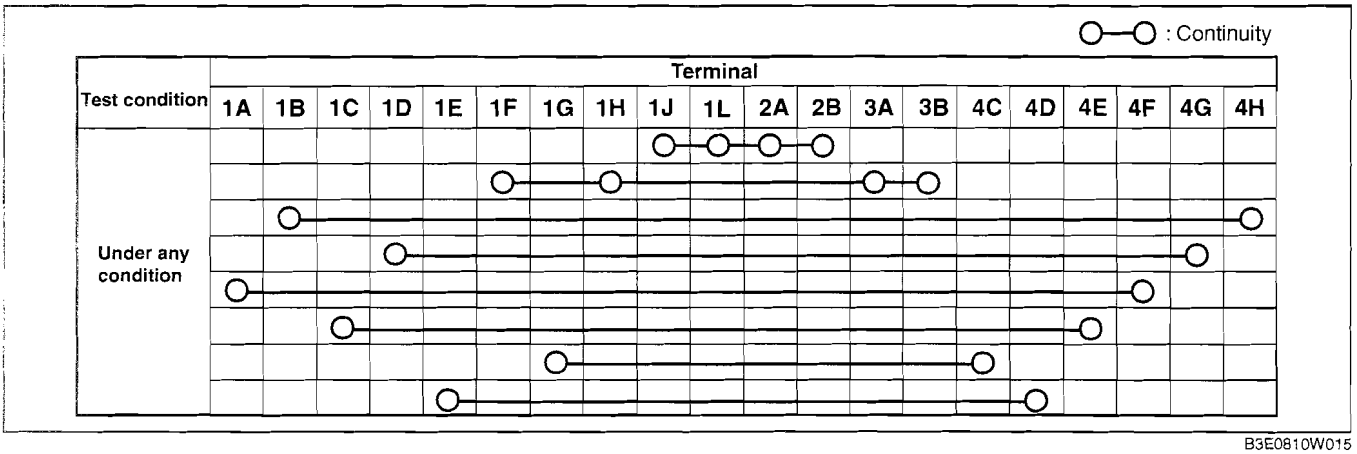
B3E0810W043

CLOCK SPRING INSPECTION

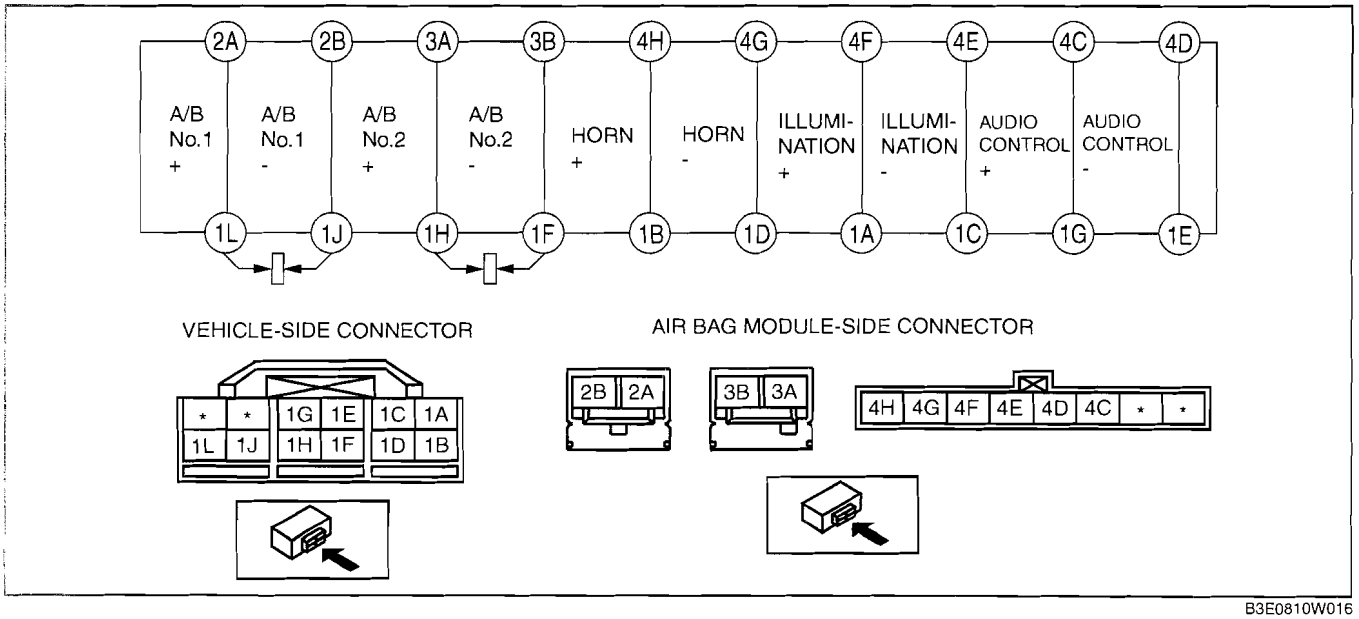
id081000802200

1. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the clock spring.

Note
- When the vehicle-side connector for the clock spring is disconnected, terminals 1F, 1H, 1J and 1L are shorted to prevent unexpected operation (deployment) of the air bag module.



B3E0810W015



B3E0810W016

AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES

id081000801100

Warning

- **A live (undeployed) air bag module or pre-tensioner seat belt may accidentally operate (deploy) when it is disposed of and cause serious injury. Do not dispose of a live (undeployed) air bag module and pre-tensioner seat belt. If the SSTs (Deployment tool and Adapter harness) are not available, consult the nearest Mazda representative for assistance.**

Caution

- **Deploying the air bag modules and pre-tensioner seat belts inside the vehicle may cause damage to the vehicle interior. When the vehicle is not to be scrapped, always deploy the air bag modules and pre-tensioner seat belts outside the vehicle.**

- If the vehicle is to be scrapped, or when disposing of any air bag modules or pre-tensioner seat belts, operate (deploy) them inside the vehicle by following the deployment procedure below and using the **SST** (Deployment tool).
- When disposing of a operated (deployed) air bag module and pre-tensioner seat belt, refer to "AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES".

Deployment Procedure for Inside of Vehicle

1. Inspect the **SST** (Deployment tool). (See 08-10-31 INSPECTION OF SST (DEPLOYMENT TOOL).)
2. Move the vehicle to an open space, away from strong winds, and close all of the vehicle doors and windows.
3. Turn the ignition switch to the LOCK position.
4. Disconnect the negative battery cable and wait for **1 min or more**.
5. Follow the procedure below for operating (deploying) the applicable air bag module or pre-tensioner seat belt.

Driver-side air bag module

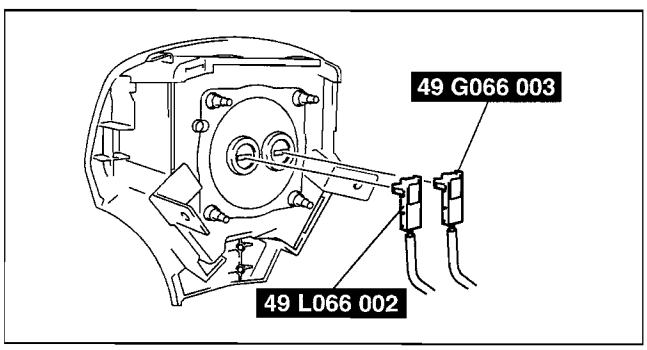
Warning

- **The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.**

Note

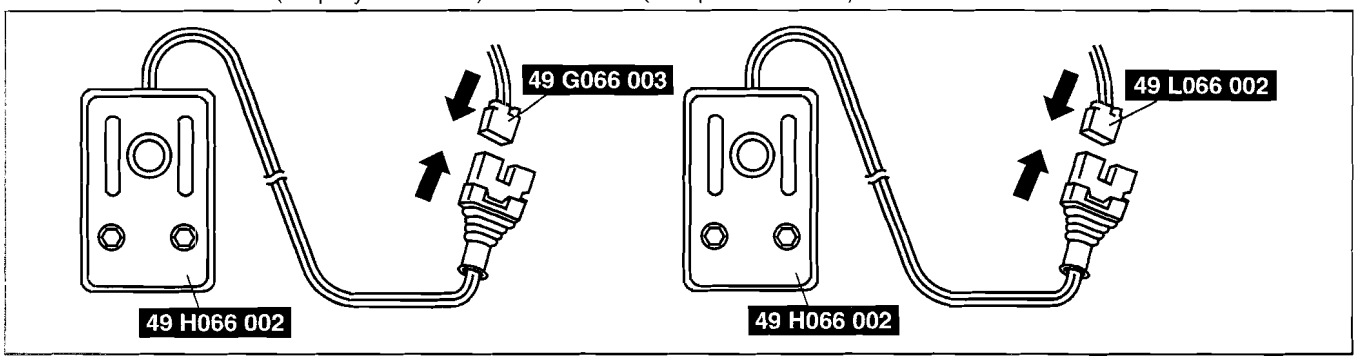
- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the driver-side air bag module.

1. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
2. Connect the **SSTs** (Adapter harness) to the driver-side air bag module as shown in the figure.
3. Install the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)



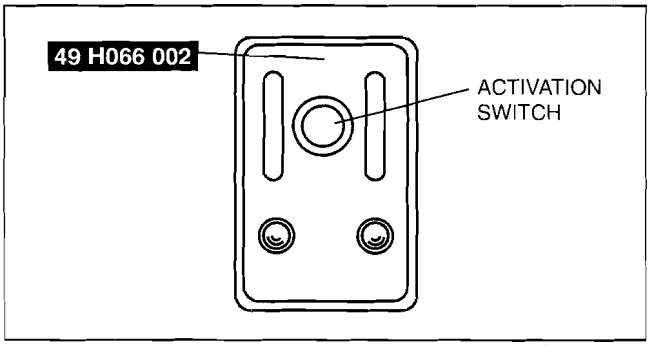
e3u810zw6008

4. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).



B3E0810W020

5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.
8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

Warning

- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 8 again. In case that the two operation (explosive) sounds in total are not verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can get burned. Do not touch the air bag module for at least 15 min after deployment.**

9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

Passenger-side air bag module

Warning

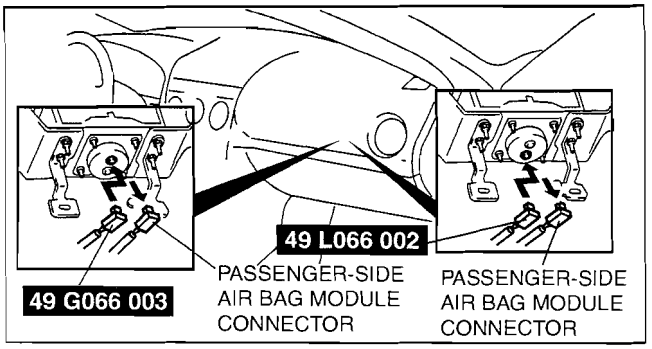
- **The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.**

Note

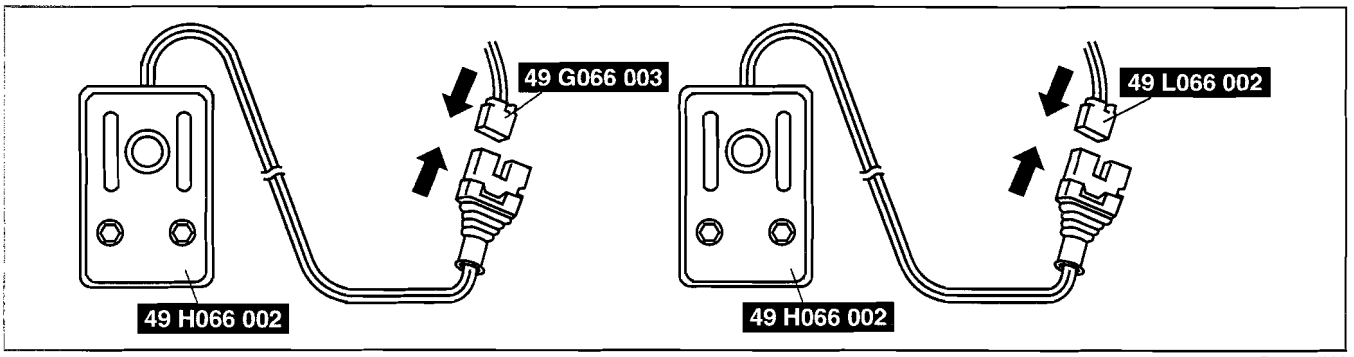
- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the passenger-side air bag module.

1. Remove the glove compartment. (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
2. Disconnect the passenger-side air bag module connector.

3. Connect the **SSTs** (Adapter harness) to the passenger-side air bag module as shown in the figure.
4. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).

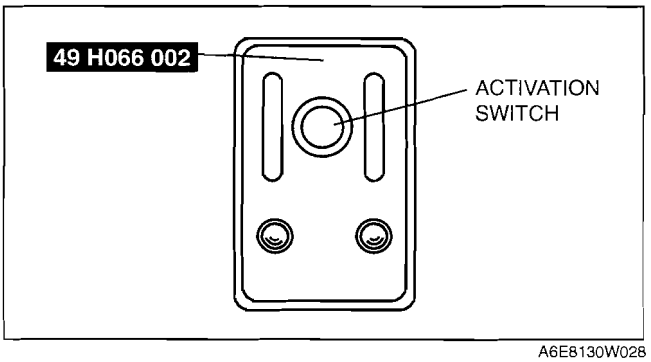


B3E0810W021



B3E0810W020

5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.
8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

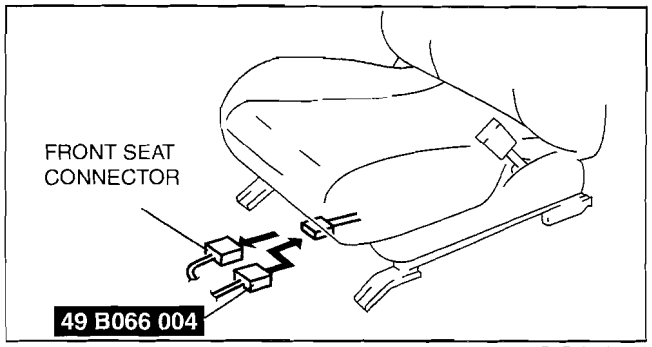
Warning

- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 8 again. In case that the two operation (explosive) sounds in total are not verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

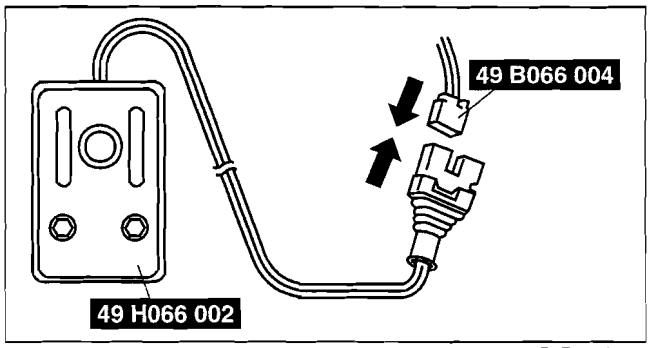
Side air bag module

1. Disconnect the front seat connector.
2. Connect the **SST** (Adapter harness) to the side air bag module as shown in the figure.



B3E0810W022

3. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
4. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
5. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
6. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

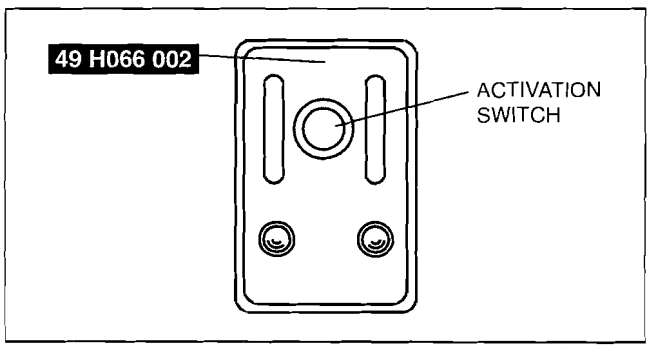


B3E0810W023

7. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the side air bag module.

   Warning
   - **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

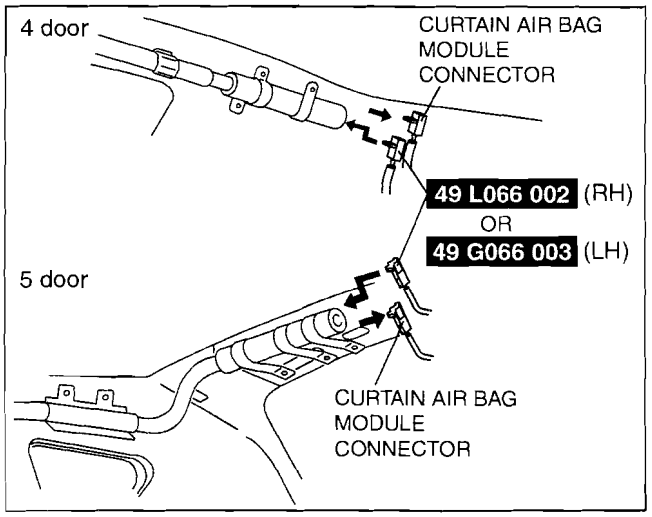
8. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).



A6E8130W028

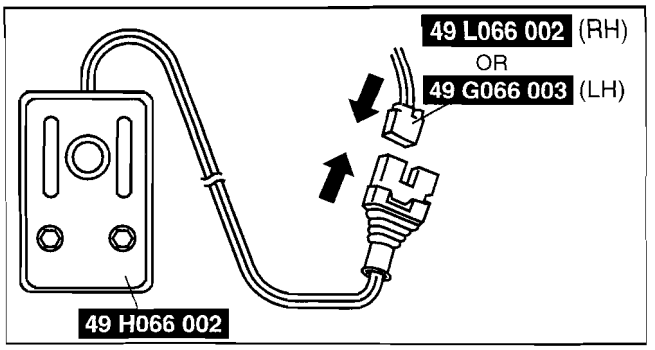
Curtain air bag module

1. Remove the C-pillar trim. (4 door) (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
2. Partially peel back the headliner. (5 door)
3. Disconnect the curtain air bag module connector.
4. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure.



e3u810zw6009

5. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
6. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
7. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
8. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

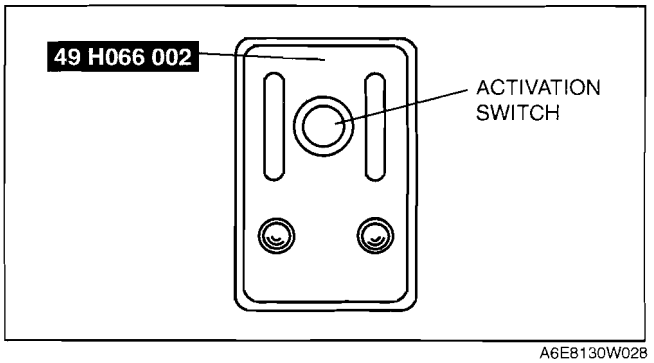


e3u810zw6016

9. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the curtain air bag module.

Warning
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

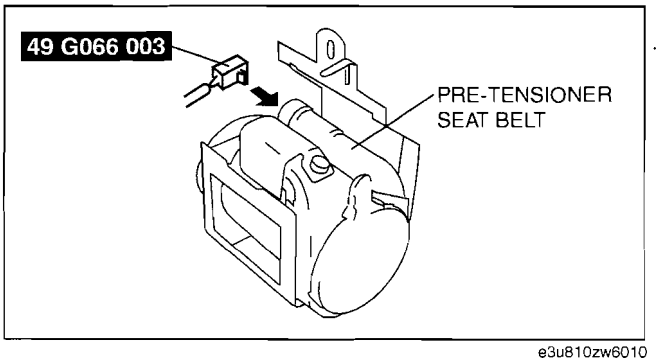
10. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).



A6E8130W028

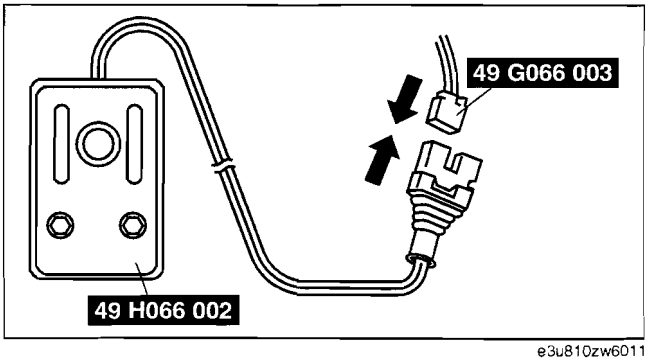
Pre-tensioner seat belt

1. Remove the B-pillar lower trim. (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
2. Disconnect the pre-tensioner seat belt connector.
3. Connect **the SST** (Adapter harness) to the pre-tensioner seat belt module as shown in the figure.



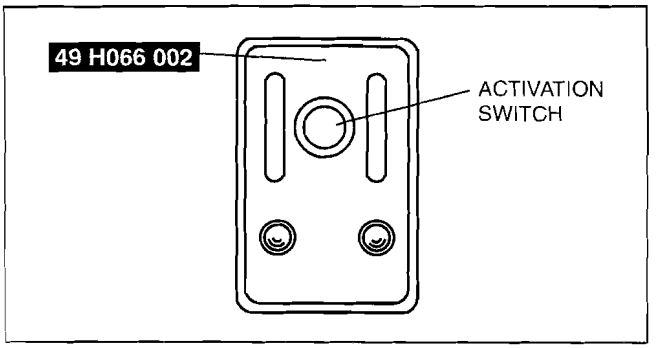
e3u810zw6010

4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
5. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.



e3u810zw6011

8. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the pre-tensioner seat belt.



A6E8130W028

Warning
- **The pre-tensioner seat belt is very hot immediately after it is operated (deployed). You can be burned. Do not touch the pre-tensioner seat belt for at least 15 min after deployment.**

9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

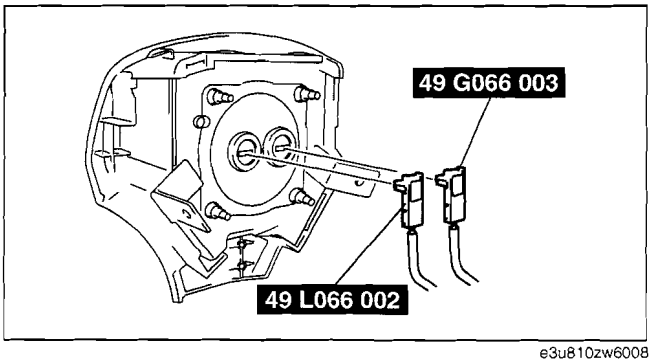
Deployment Procedure for Outside of Vehicle

1. Inspect the **SST** (Deployment tool). (See 08-10-31 INSPECTION OF SST (DEPLOYMENT TOOL).)
2. Turn the ignition switch to the LOCK position.
3. Disconnect the negative battery cable and wait for **1 min or more**.
4. Follow the procedure below for operating (deploying) the applicable air bag module or pre-tensioner seat belt.

Driver-side air bag module

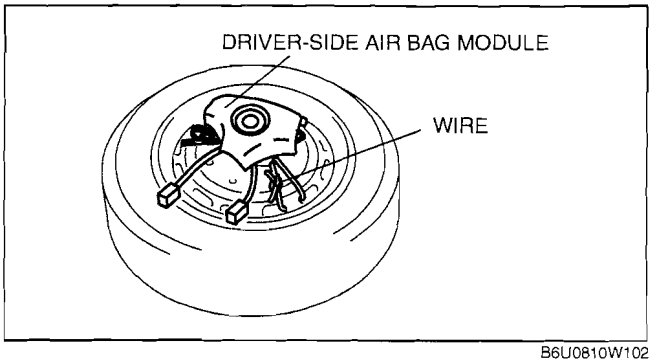
Warning
- **The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.**

1. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
2. Connect the **SSTs** (Adapter harness) to the driver-side air bag module as shown in the figure.



e3u810zw6008

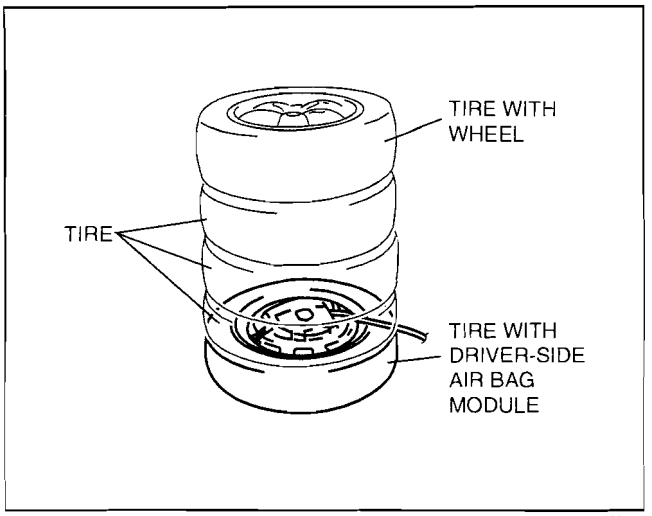
3. Place the driver-side air bag module on the center of the tire wheel with the padded surface facing up. To secure the air bag module to the tire wheel, wrap a wire (cross section **1.25 mm^2 {0.002 in^2} or more**) through the wheel and the bolt installation holes of the air bag module **at least 4 times**.



B6U0810W102

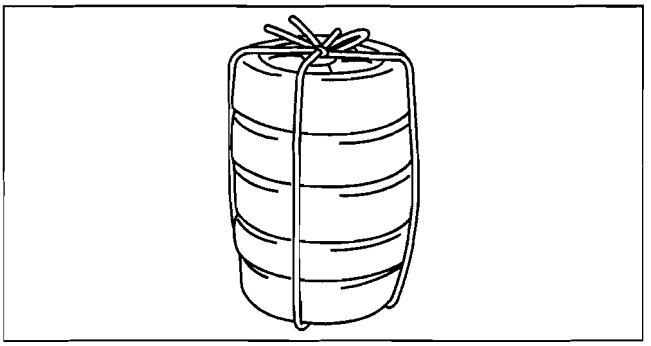
Warning
- **If the air bag module is not properly installed to the tire wheel, serious injury may occur when the module is operated (deployed). When installing the air bag module to the tire wheel, make sure the padded surface is facing up.**

4. Stack three tires without wheels on top of the tire with the driver-side air bag module, and then stack another tire with a wheel on the very top.



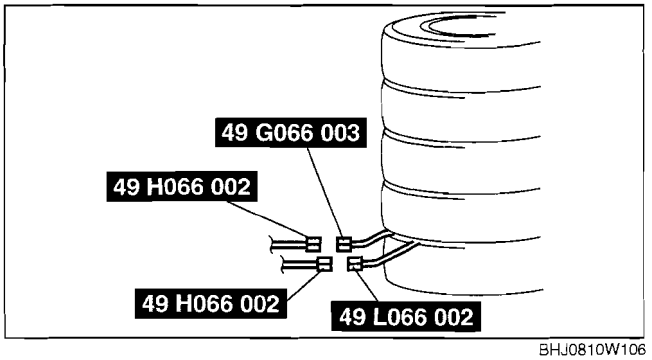
A6E8130W033

5. Secure the tires with wire.



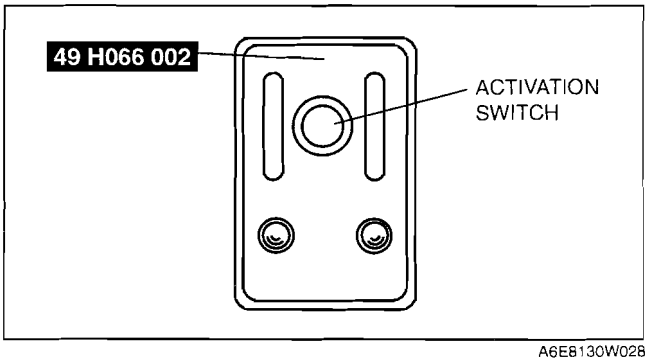
A6E8130W034

6. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).
7. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
8. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
9. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.



BHJ0810W106

10. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

Warning

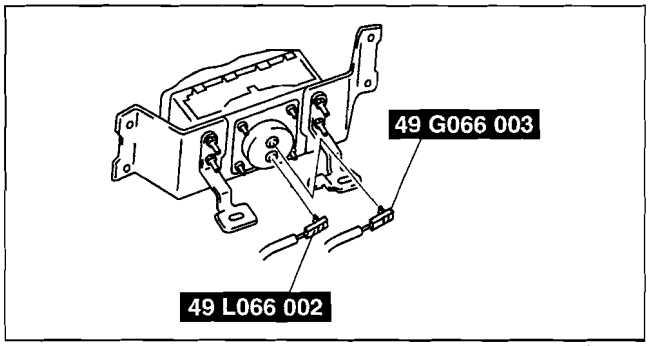
- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 10 again. In case that the two operation (explosive) sounds in total are not verified even though Step 10 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

11. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

Passenger-side air bag module

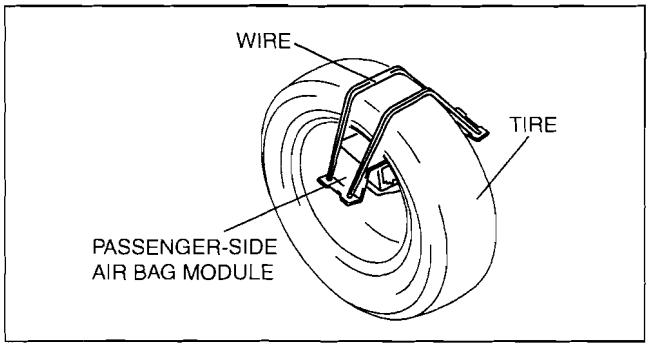
Warning
- **The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.**

1. Remove the passenger-side air bag module. (See 08-10-7 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Connect the **SSTs** (Adapter harness) to the passenger-side air bag module as shown in the figure.



e3u810zw6012

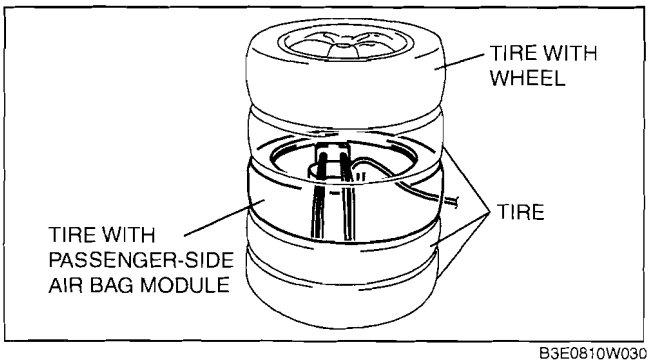
3. Place the padded surface of the passenger-side air bag module facing the center of the tire as shown in the figure. To secure the air bag module to the tire wheel, wrap a wire (cross section **1.25 mm^2 {0.002 in^2} or more**) through the tire and the bolt installation holes **at least 4 times** as shown in the figure.



B3E0810W029

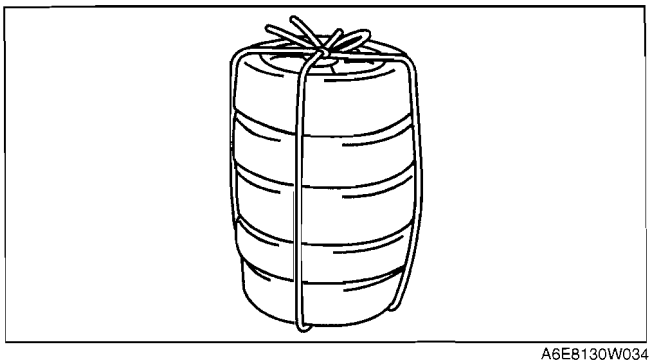
Warning
- **If the air bag module is not properly installed to the tire, serious injury may occur when the module is operated (deployed). When installing the air bag module to the tire, make sure the padded surface is facing the center of the tire.**

4. Stack the tire with the passenger-side air bag module on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the passenger-side air bag module, and then stack another tire with a wheel on the very top.



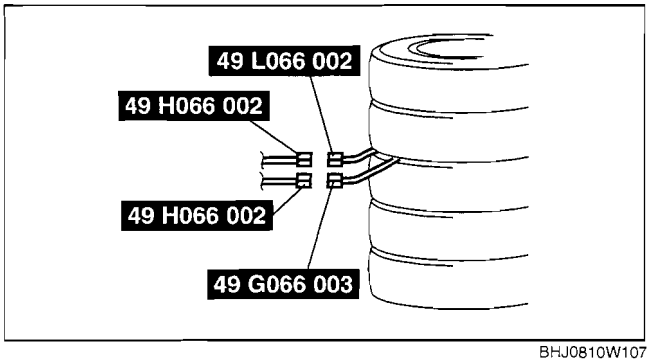
B3E0810W030

5. Secure the tires with wire.



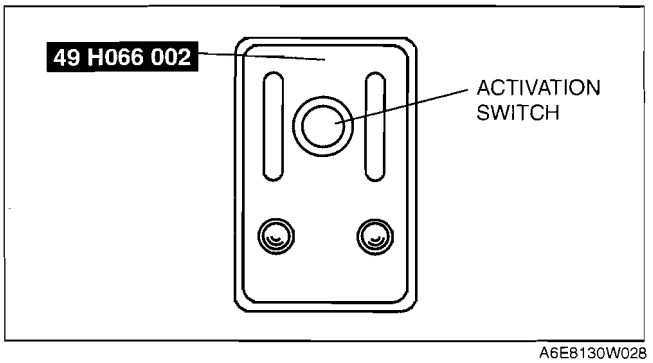
A6E8130W034

6. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).
7. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
8. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
9. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.



BHJ0810W107

10. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



A6E8130W028

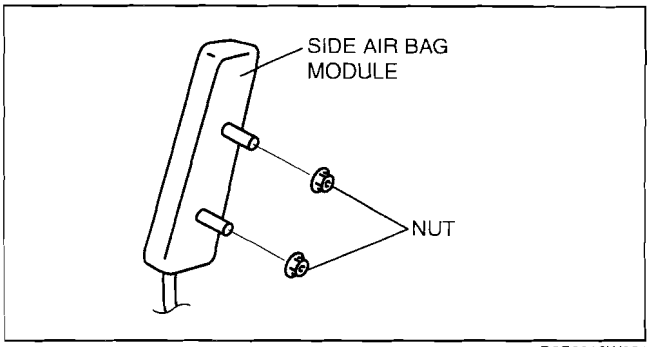
Warning

- **Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury because the air bag module may operate (deploy) accidentally. If the two operation (explosive) sounds are not heard, perform Step 11 again. In case that the two operation (explosive) sounds in total are not verified even though Step 11 is performed again, leave the air bag module alone for 30 min or more before getting near it again.**
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

11. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

Side air bag module

1. Remove the side air bag module. (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Install the nuts to the side air bag module.

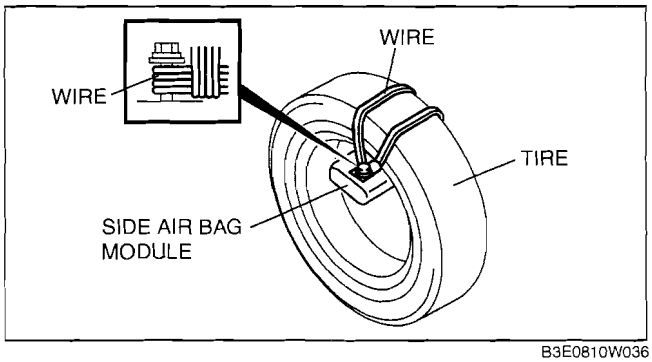


B3E0810W031

3. Place the padded surface of the side air bag module facing the center of the tire as shown in the figure. To secure the air bag module to the tire wheel, wrap a wire (cross section 1.25 mm2 {0.002 in2} or more) through the tire and around the bolts at least 4 times.

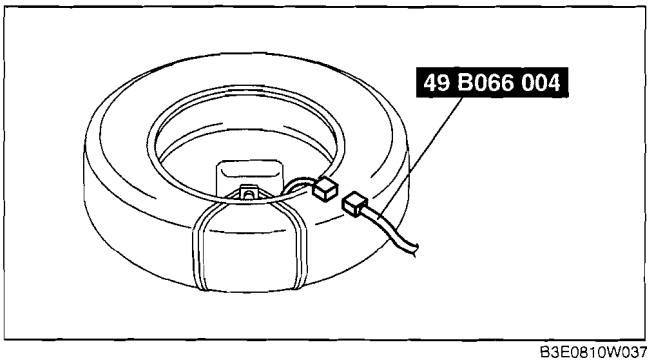
Warning

- **If the air bag module is not properly installed to the tire, serious injury may occur when the module is operated (deployed). When installing the air bag module to the tire, make sure the padded surface is facing the center of the tire.**



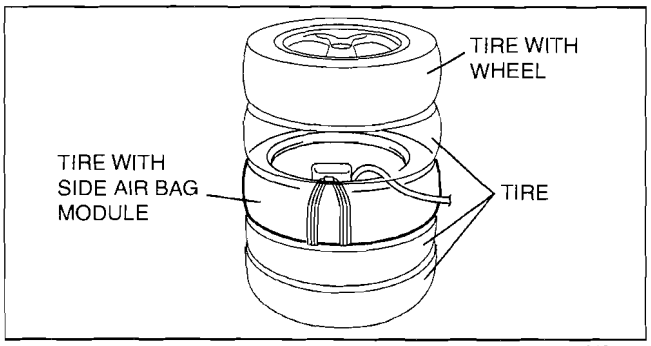
B3E0810W036

4. Connect the **SST** (Adapter harness) to the side air bag module as shown in the figure.



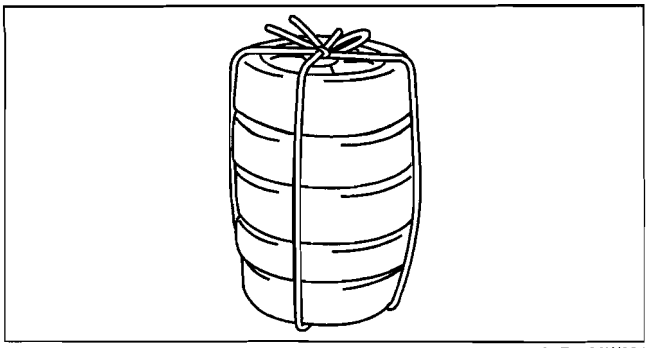
B3E0810W037

5. Stack the tire with the side air bag module on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the side air bag module, and then stack another tire with a wheel on the very top.

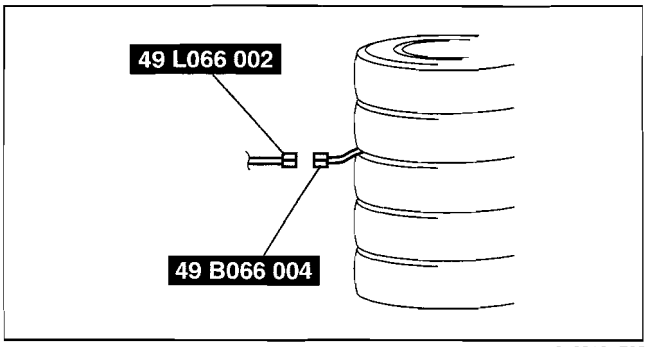


c3u0810w700

6. Secure the tires with wire.


A6E8130W034

7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
9. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
10. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

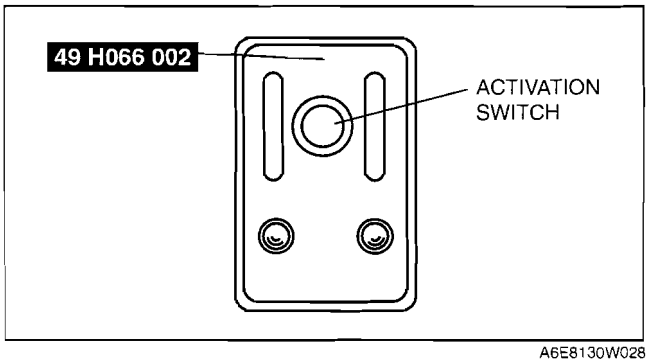


c3u0810w706

11. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the side air bag module.

Warning
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

12. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

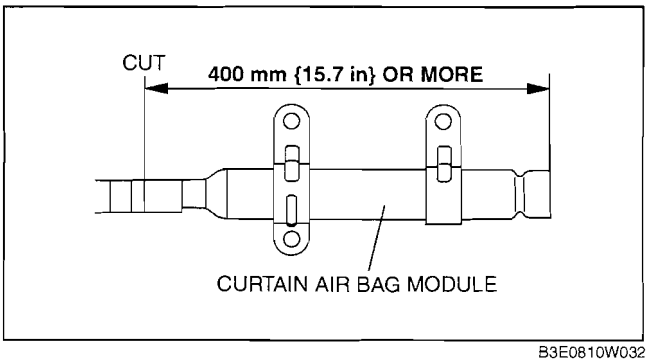


A6E8130W028

Curtain air bag module

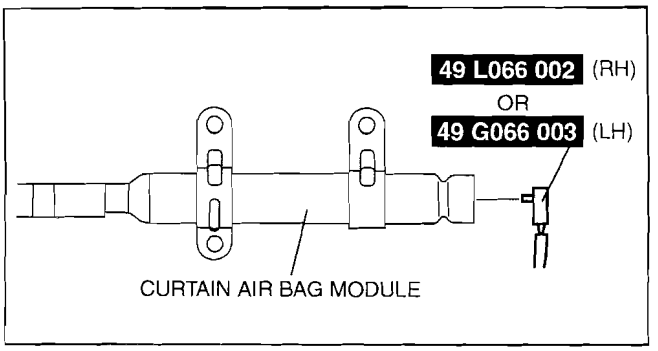
1. Remove the curtain air bag module. (See 08-10-9 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Secure the curtain air bag module in a vise, and cut off the deployment section, as shown in the figure.

Warning
- **Be sure not to crush the pipe on the side where it is cut. If it is crushed completely, the interior pressure of the pipe will build up and can cause it to explode during air bag module operation (deployment).**



B3E0810W032

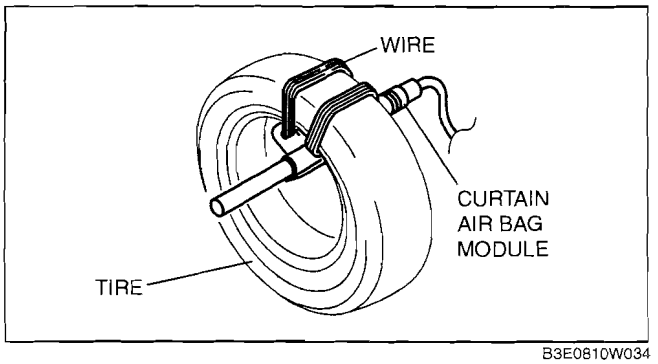
3. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure.



e3u810zw6013

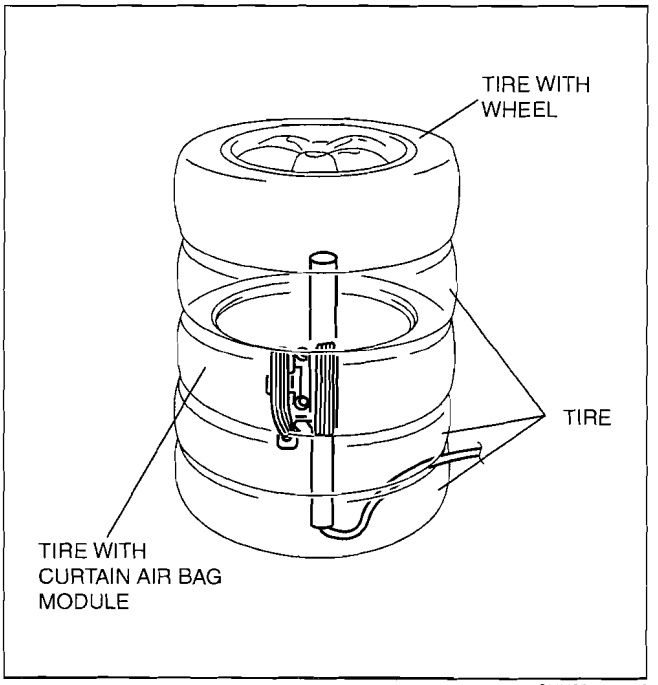
4. Secure the curtain air bag module to the tire, by wrapping a wire (cross section **1.25 mm^2 {0.002 in^2} or more**) through the tire and the bolt installation holes **at least 4 times** as shown in the figure.

Warning
- **If the air bag module is not properly installed to the tire, serious injury may occur when the module is operated (deployed). Make sure to install the air bag module securely.**



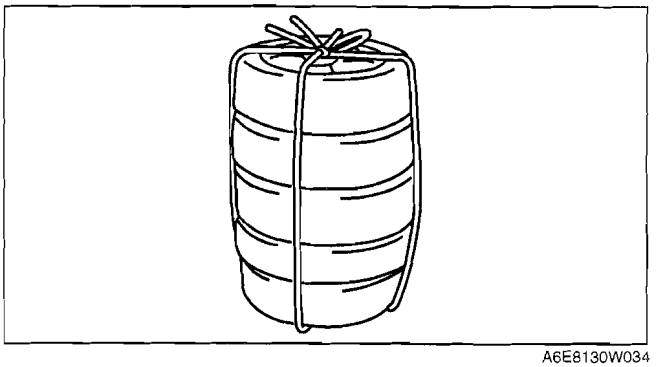
B3E0810W034

5. Stack the tire with the curtain air bag module on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the curtain air bag module, and then stack another tire with a wheel on the very top.



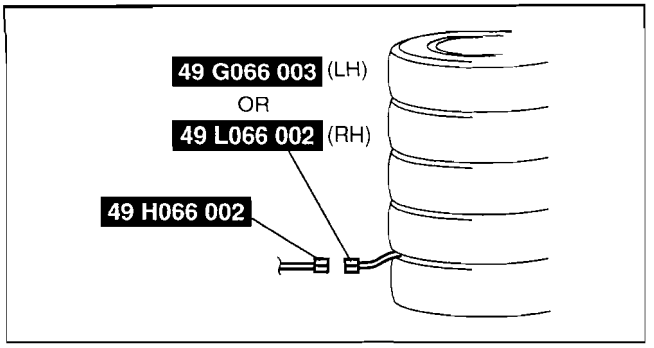
CHU0810W119

6. Secure the tires with wire.



A6E8130W034

7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
9. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
10. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

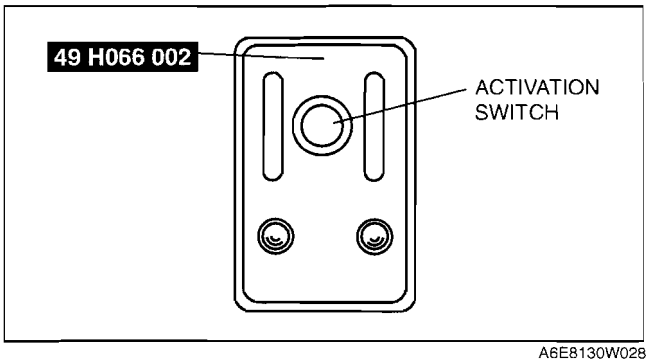


e3u810zw6014

11. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the curtain air bag module.

Warning
- **The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.**

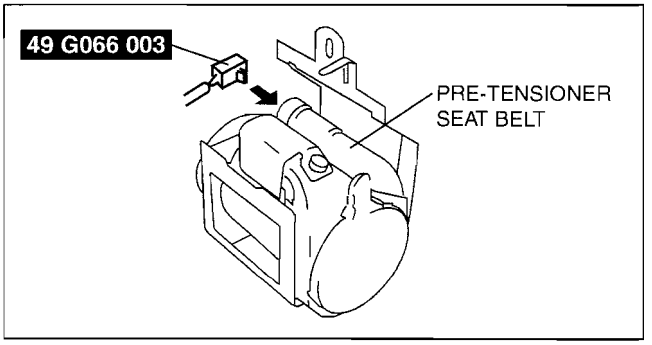
12. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).



A6E8130W028

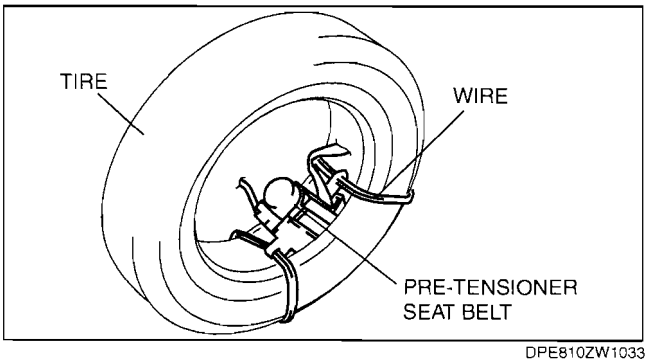
Pre-tensioner seat belt

1. Remove the pre-tensioner seat belt. (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
2. Connect the **SST** (Adapter harness) to the pre-tensioner seat belt as shown in the figure.



e3u810zw6010

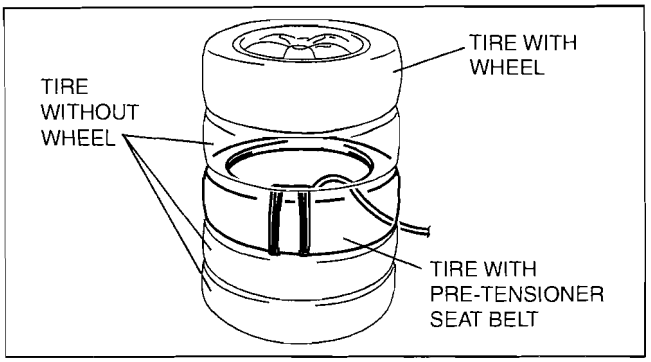
3. Place the pre-tensioner seat belt on the center of the tire wheel with the padded surface facing up. To secure the pre-tensioner seat belt to the tire wheel, wrap a wire (cross section **1.25mm^2 {0.002 in^2} or more**) through the wheel and the bolt installation holes of the pre-tensioner seat belt **at least 4 times**.



DPE810ZW1033

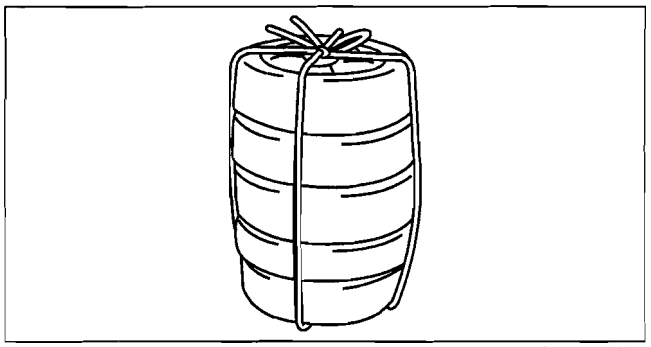
Warning
- **If the pre-tensioner seat belt is not properly secured to the tire, serious injury may occur when the pre-tensioner part is deployed. When installing the pre-tensioner seat belt to the tire, make sure the pre-tensioner part is inside the tire.**

4. Stack the tire with the pre-tensioner seat belt on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the pre-tensioner seat belt, and then stack another tire with a wheel on the very top.

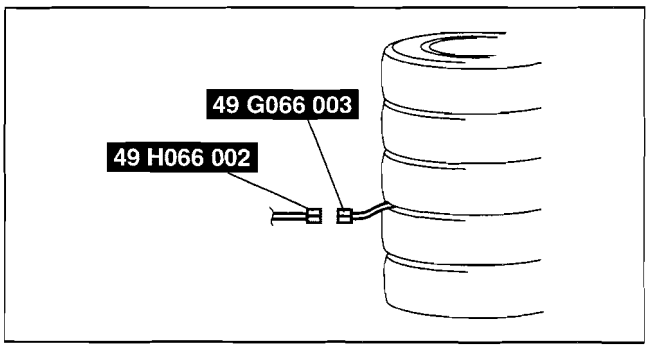


DPE810ZW1034

5. Secure the tires with wire.


A6E8130W034

6. Connect the **SST** (Deployment tool) to the SST (Adapter harness).
7. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and black clip to the negative battery terminal.
8. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
9. Verify that all persons are standing **at least 6 m {20 ft} away from the vehicle.**

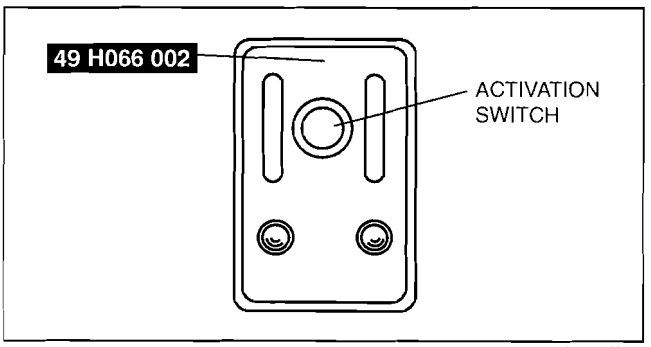


e3u810zw6015

10. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the pre-tensioner seat belt.

Warning
- **The pre-tensioner seat belt is very hot immediately after it is operated (deployed). You can be burned. Do not touch the pre-tensioner seat belt for at least 15 min after deployment.**

11. Disconnect the SSTs (Deployment tool) from the SSTs (Adapter harness).



A6E8130W028

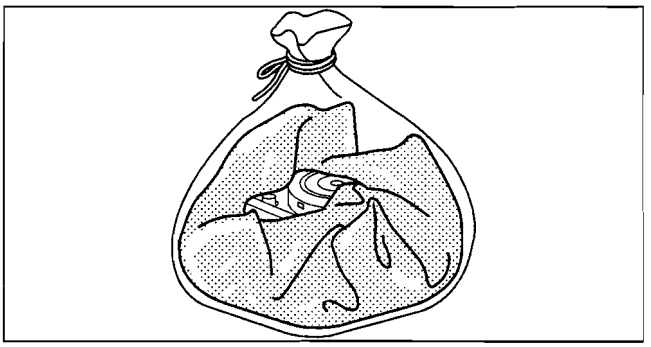
AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES

id081000801200

Warning

- **A live (undeployed) air bag module or pre-tensioner seat belt may accidentally operate (deploy) when it is disposed of and cause serious injury. Always refer to the "AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES" and dispose of air bag modules and pre-tensioner seat belts in a deployed condition.**
- **The air bag modules and the pre-tensioner seat belts are very hot immediately after they are deployed. You can be burned. Do not touch an air bag module and pre-tensioner seat belt for at least 15 min after deployment.**
- **Pouring water on the deployed air bag module and pre-tensioner seat belt is dangerous. The water will mix with the residual gases to form a gas that can make breathing difficult. Do not pour water on the deployed air bag module and pre-tensioner seat belt.**
- **The deployed air bag module or pre-tensioner seat belt may contain deposits of sodium hydroxide, a caustic byproduct of the gas-generated combustion. If this substance gets into your eyes or on your hands, it can cause irritation and itching. When handling the deployed air bag module and pre-tensioner seat belt, wear gloves and safety glasses.**
- **Due to the adoption of 2-step deployment control in both the driver and passenger-side air bag modules, depending on the impact force, it is possible that inflator No.2 might not operate (deploy). Before disposing of the air bag module, always follow the inflator deployment procedures and verify the complete operation (deployment) of inflators No.1 and 2.**

1. Remove the deployed air bag module or pre-tensioner seat belt.
2. Put the air bag module or pre-tensioner seat belt in a plastic bag, seal the bag, and then dispose of it.

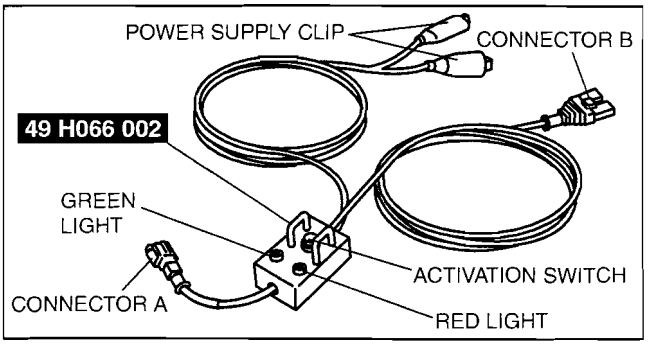


BHJ0810W023

INSPECTION OF SST (DEPLOYMENT TOOL)

id081000801000

1. Before using the **SST** (49 H066 002), inspect its operation.



EPU810ZW3011

Inspection Procedure

1. Follow the steps below to inspect the SST (49 H066 002).
   - If not as indicated in the table, replace the **SST** (49 H066 002) because it has a malfunction.

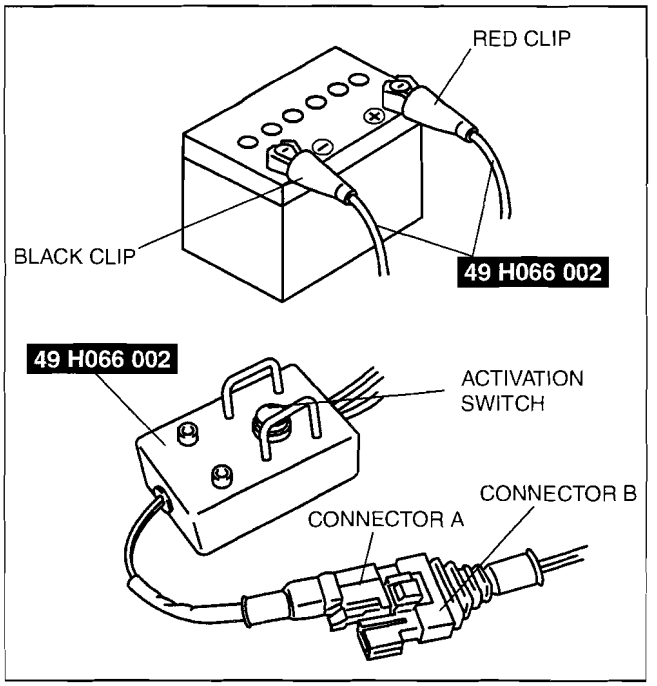
Warning

- **Do not use a malfunctioning SST (49 H066 002), otherwise it could cause the air bag module or pre-tensioner seat belt to accidentally operate (deploy).**

Caution

- **Because the permissible voltage for the SST (49 H066 002) is 12 V, do not connect a 24 V power source because it will damage the SST. Always connect only a 12 V power source.**

Step	Inspection procedure	Light condition	
		Green	Red
1	Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.	On	Off
2	Connect connectors A and B.	Off	On
3	Press the activation switch.	On	Off

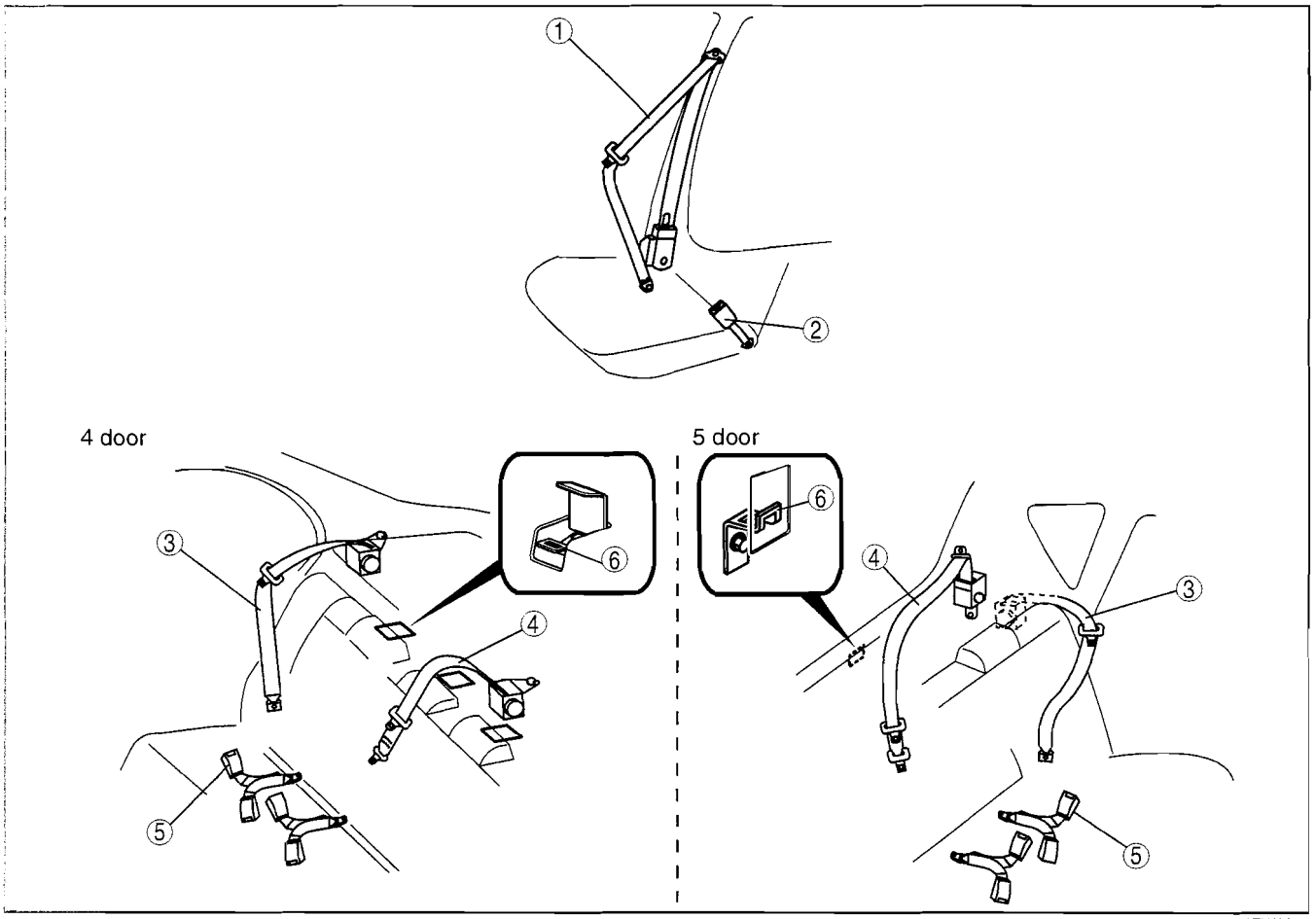


e5u810zw5050

08-11 SEAT BELT

LOCATION INDEX

id081100800200



E3U811ZW6005

1	Front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.) (See 08-11-5 SEAT BELT INSPECTION.)
2	Front buckle (See 08-11-6 FRONT BUCKLE REMOVAL/INSTALLATION.)
3	Rear seat belt (See 08-11-3 REAR SEAT BELT REMOVAL/INSTALLATION.) (See 08-11-5 SEAT BELT INSPECTION.)

4	Rear center seat belt (See 08-11-4 REAR CENTER SEAT BELT REMOVAL/INSTALLATION.) (See 08-11-5 SEAT BELT INSPECTION.)
5	Rear buckle (See 08-11-7 REAR BUCKLE REMOVAL/INSTALLATION.)
6	Child-restraint seat anchor (See 08-11-7 CHILD-RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION.)

FRONT SEAT BELT REMOVAL/INSTALLATION

id081100800600

Warning

- **Handling the front seat belt (pre-tensioner seat belt) improperly can accidentally deploy the pre-tensioner seat belt, which may seriously injure you. Read the air bag system service warnings and cautions before handling the front seat belt. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

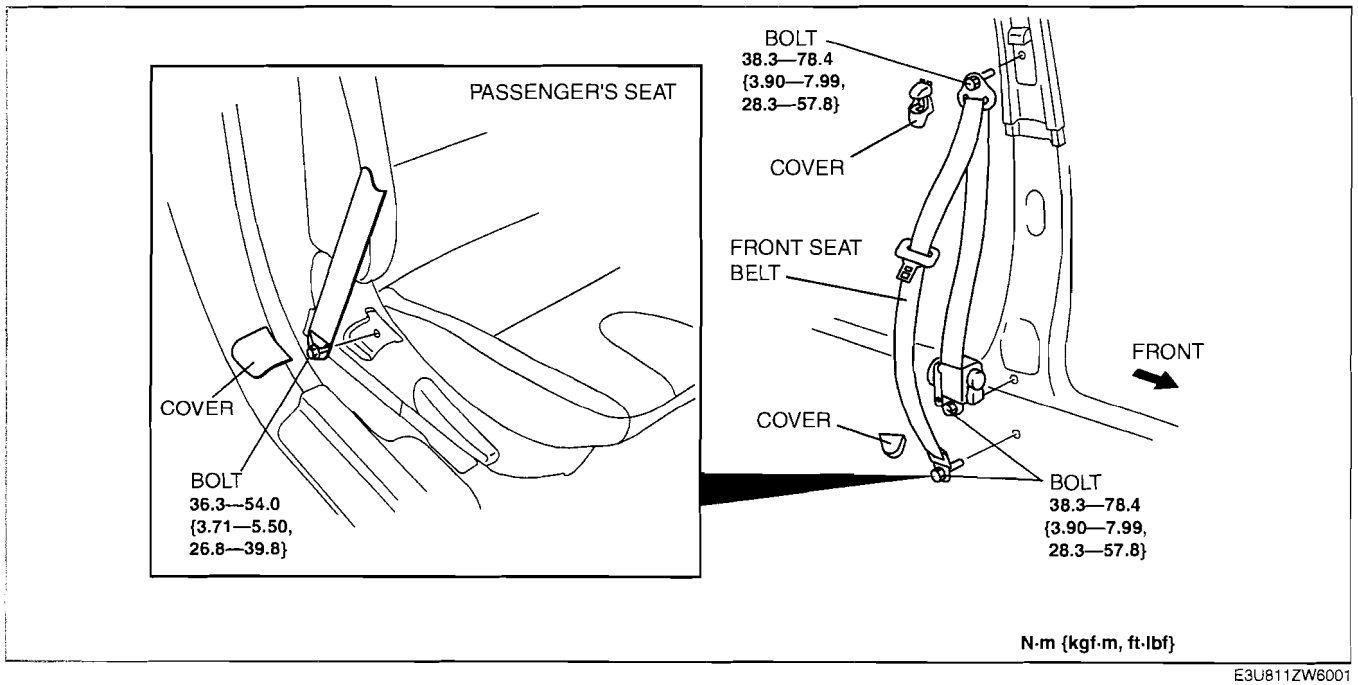
Warning

- **The side air bag sensor is attached to the lower part of the B-pillar. When working around the B-pillar, disconnect the negative battery cable avoiding excessive impact to the lower part of the B-pillar.**

Caution

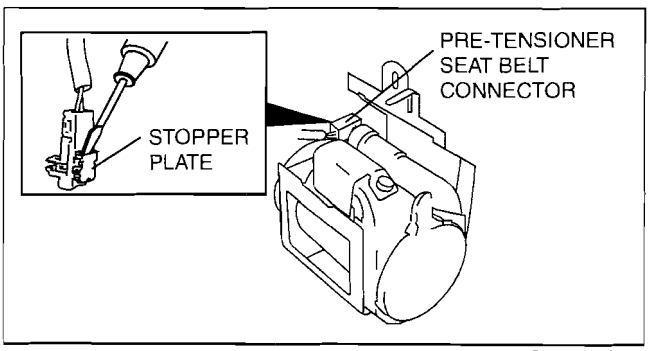
- **The ELR (emergency locking retractor) has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1min or more**.
3. Remove the front scuff plate. (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the rear scuff plate. (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
5. Remove the B-pillar lower trim. (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
6. Remove the cover.



E3U811ZW6001

7. Remove the bolt, then remove the front seat belt.
8. Using a screwdriver, pry out the pre-tensioner seat belt connector's stopper plate.
9. Disconnect the pre-tensioner seat belt connector.
10. Install in the reverse order of removal.
11. Turn the ignition switch to the ON position.
12. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
    - If the air bag system warning light dose not operate, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.



E3U811ZW6007

REAR SEAT BELT REMOVAL/INSTALLATION

id081100800800

Caution

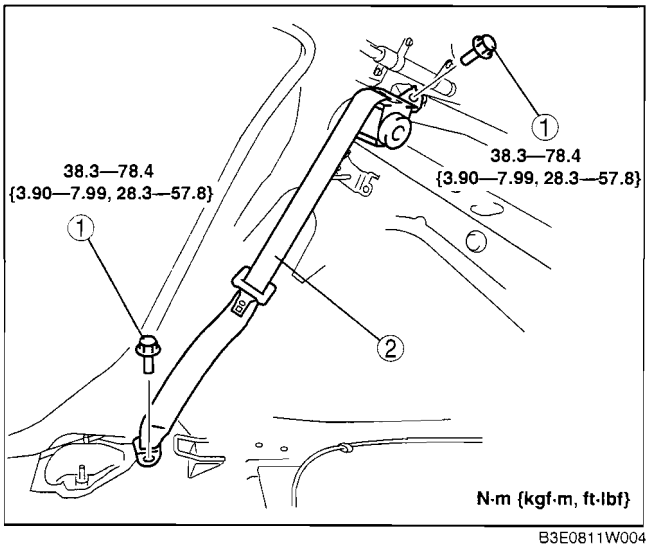
- **The ELR (emergency locking retractor) has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

4 door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (5) Rear package trim (See 09-17-16 REAR PACKAGE TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Rear seat belt

3. Install in the reverse order of removal.



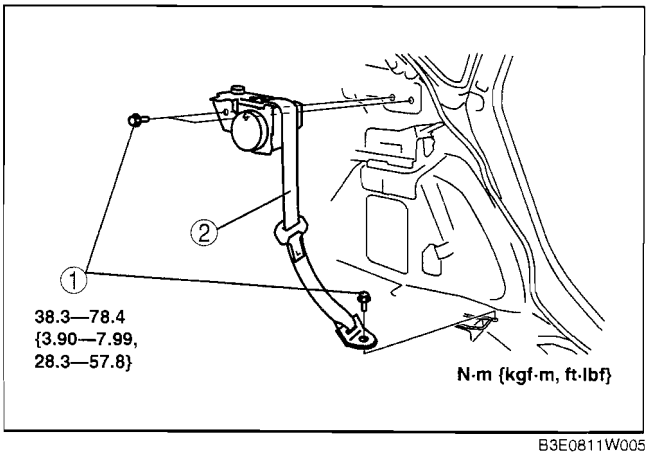
B3E0811W004

5 door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (5) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Rear seat belt

3. Install in the reverse order of removal.



B3E0811W005

REAR CENTER SEAT BELT REMOVAL/INSTALLATION

id081100800900

Caution

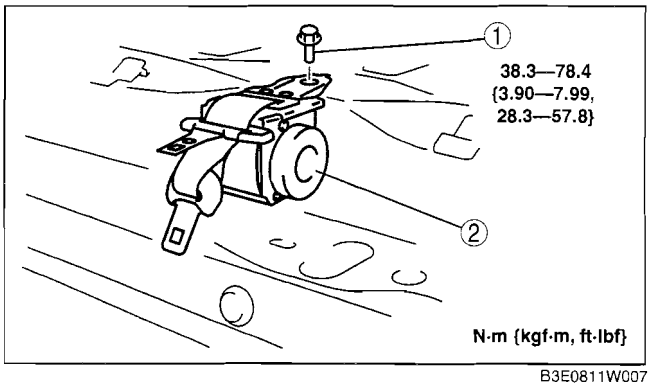
- **The ELR (emergency locking retractor) has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.**

4 door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (5) Rear package trim (See 09-17-16 REAR PACKAGE TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Rear center seat belt

3. Install in the reverse order of removal.



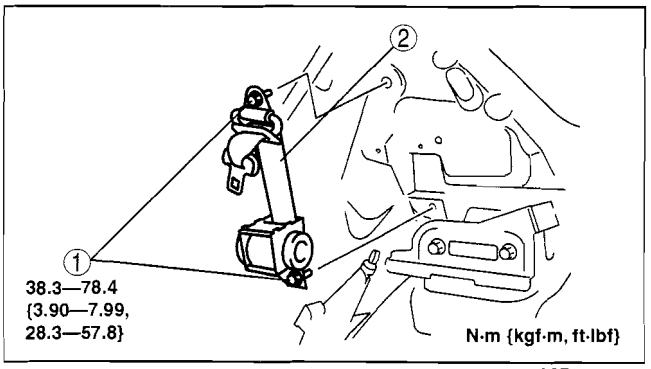
B3E0811W007

5 door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (5) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Rear center seat belt

3. Install in the reverse order of removal.



B3E0811W006

SEAT BELT INSPECTION

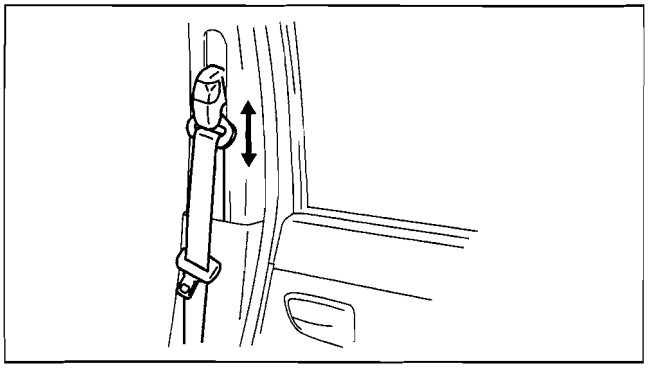
id081100800300

Belt

1. Verify that the belt is installed properly with no twists or kinks.
2. Verify that there is no damage to the seat belt and no deformation of the metal fittings.
   - If there is any malfunction, replace the seat belt.

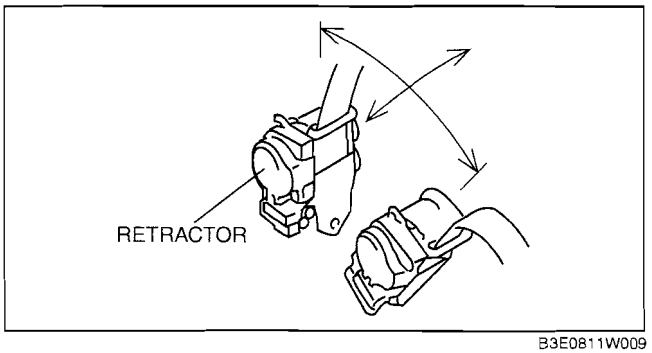
ELR

1. Verify that the belt can be pulled out smoothly, and that it retracts smoothly.
   - If there is any malfunction, replace the seat belt.
2. Verify that the retractor locks when the belt is pulled quickly.
   - If there is any malfunction, replace the seat belt.
3. Remove the retractor.



B3E0811W011

4. While pulling the seat belt out, make sure that the seat belt does not lock when the retractor is tilted slowly **up to 15°** from the mounted position and locks when the retractor is tilted **40° or more**.
   - If there is any malfunction, replace the seat belt.



B3E0811W009

ALR

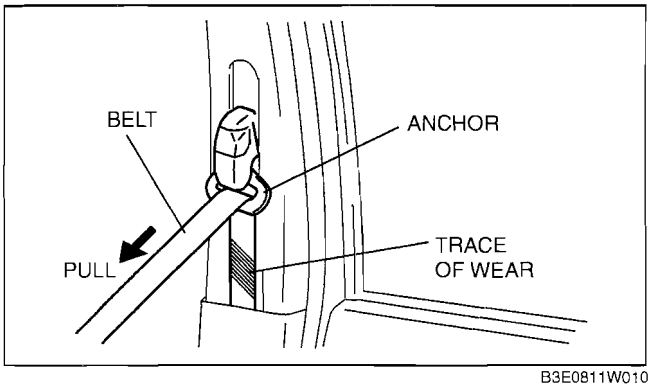
1. Pull the belt out fully to change the lock mode from ELR to ALR.
2. Verify that retractor makes a clicking sound as the belt slowly retracts. If no sound is heard, the lock mode has not changed to ALR. If necessary, repeat Step 1.
   - If there is any malfunction, replace the seat belt.
3. Verify that the retractor locks when pulled.
   - If there is any malfunction, replace the seat belt.
4. Verify that the lock mode changes to ELR when the belt is fully pulled out.
   - If there is any malfunction, replace the seat belt.

Load Limiter Retractor

Warning

- **When the load limiter operates, the belt and anchor rub against each other strongly leaving wear tracks. If the seat belt is used in this state, the seat belt will not function at its full capability and there is the possibility of serious injury to passengers. Be sure to replace the seat belt once the load limiter operates.**

1. If the vehicle has been subjected to a shock in an accident, pull the belt from the retractor and confirm that there are no wear tracks (the load limiter has not operated) by visually inspecting and feeling the belt.
   - If there is any malfunction, replace the seat belt.

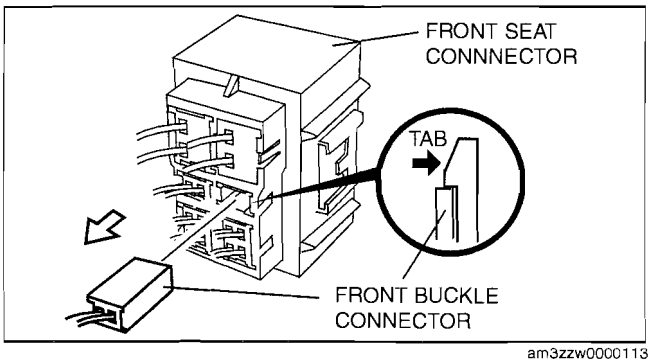


B3E0811W010

FRONT BUCKLE REMOVAL/INSTALLATION

id081100800400

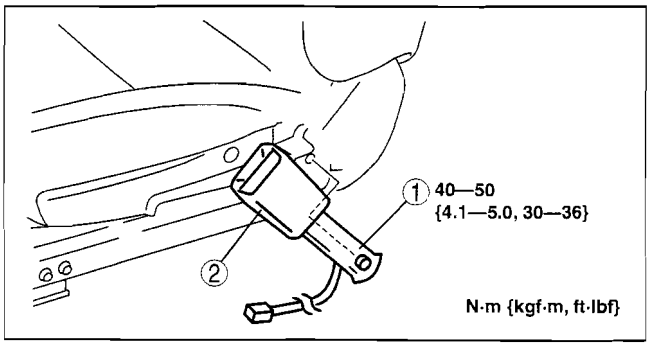
1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable.
3. Remove the front seat. (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
4. Detach the tab as shown in the figure and remove the connector from the front seat connector.



am3zzw0000113

5. Remove in the order indicated in the table.

1	Bolt
2	Front buckle



am3zzw0000113

6. Install in the reverse order of removal.

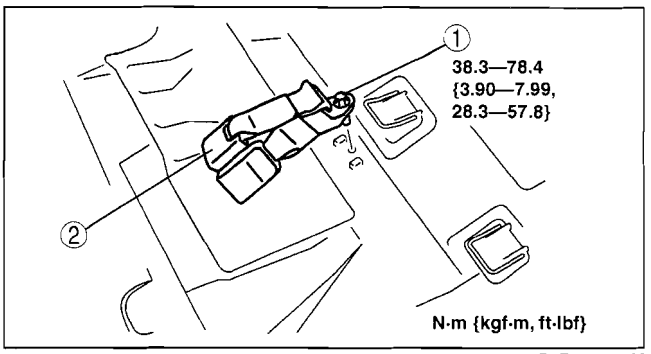
REAR BUCKLE REMOVAL/INSTALLATION

id081100800700

1. Remove the rear seat cushion. (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Rear buckle

3. Install in the reverse order of removal.



B3E0811W008

FRONT BUCKLE INSPECTION

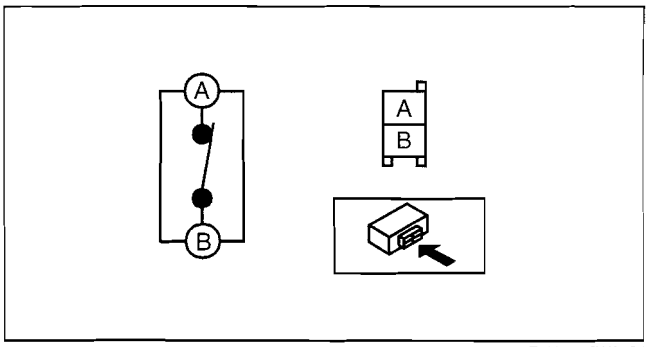
id081100800500

1. Inspect for continuity between the buckle switch terminals using a tester.
   - If not as indicated in the table, replace the front buckle.

O—O : Continuity

Seat belt	Terminal	
	A	B
Fastened		
Unfastened	O	O

A6E7750W009



E3U811ZW6004

CHILD-RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION

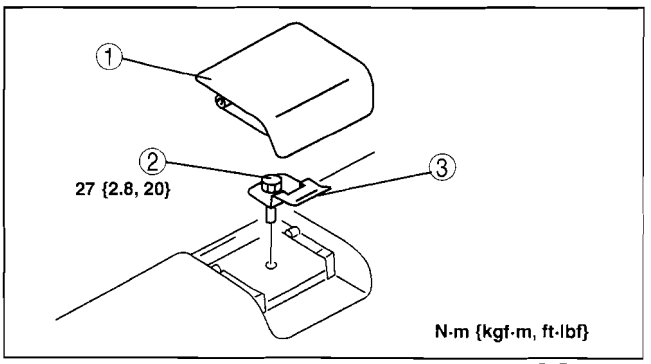
id081100800100

4 door

1. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Child-restraint seat anchor

2. Install in the reverse order of removal.



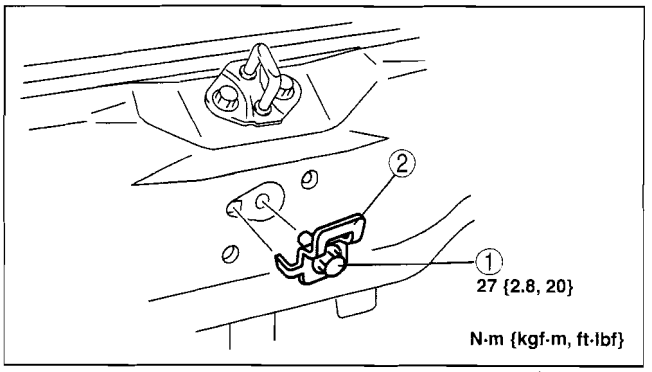
B3E0811W504

5 door

1. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Bolt
2	Child-restraint seat anchor

3. Install in the reverse order of removal.

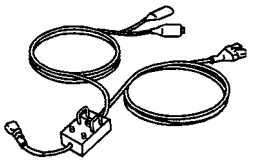
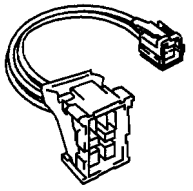
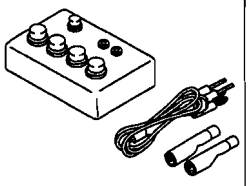


B3E0811W012

08-60 SERVICE TOOLS

RESTRAINTS SST

id086000800100

49 H066 002 Deployment tool 	49 B066 004 Adapter harness 	49 L066 002 Adapter harness 
49 G066 003 Adapter harness 	49 N088 0A0 Fuel and Thermometer checker 	-

BODY & ACCESSORIES

09 SECTION

09-02A ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

FOREWORD[IMMOBILIZER SYSTEM]

id0902e4800100

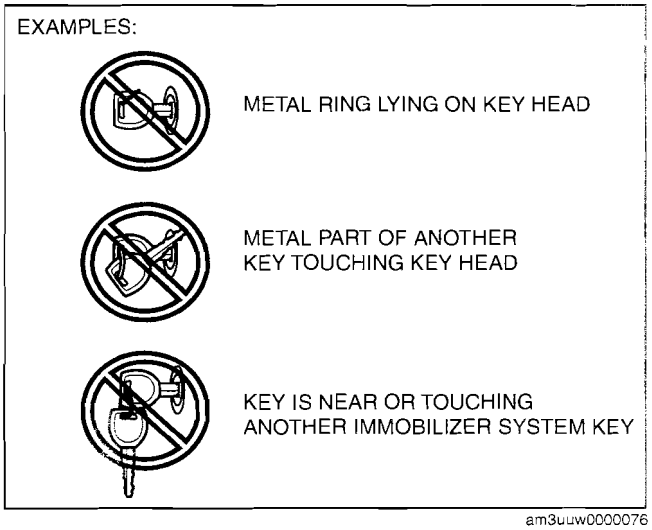
- Malfunction diagnosis occurs automatically when the ignition switch is turned from the LOCK (ACC) to the ON (START) position.
- If the results of the malfunction diagnosis show a malfunction, the security light displays a DTC and the PCM stores the DTC. DTCs stored in the PCM can be verified using the M-MDS.
- DTCs for the immobilizer system that are stored in the PCM are cleared when the ignition switch is turned from the ON to the LOCK (ACC) position.
- There are certain DTCs which can only be verified using the M-MDS, not the security light.
- The PID/data monitor function can be used to verify the number of keys registered for a single vehicle.
- If DTCs are not displayed even though the engine does not start, perform the following symptom troubleshooting:
  — 01-03A-19 NO.3 WILL NOT CRANK[LF, L3]

Caution

- **Always use the M-MDS to verify DTCs even if the DTCs are verified by the security light display. If the security light has a malfunction, it is possible that a DTC may not be properly displayed.**
- **Always use the M-MDS to verify DTCs because there are certain DTCs which cannot be verified using the security light.**
- **If any of the following items are touching or near the key head, signal communication between the key and vehicle is negatively affected, resulting in the engine not starting. Do not start the engine if any of the following items are touching or near the key head.**
  — **Any metallic object**
  — **Spare keys or keys for other vehicles equipped with an immobilizer system**
  — **Any electronic device, or any credit or other cards with magnetic strips**

Note

- If multiple DTCs are detected as a result of malfunction diagnosis, only the DTC with the lowest number of those detected will be displayed by the security light. The PCM stores multiple DTCs at the same time.
- If two or more immobilizer system DTCs are verified, first repair the part indicated by the security light displayed DTC. After repairing one location, turn the ignition switch from the LOCK to the ON position and perform an immobilizer system malfunction diagnosis.



am3uuw0000076

DTC INSPECTION[IMMOBILIZER SYSTEM]

id0902e4800200

Security Light

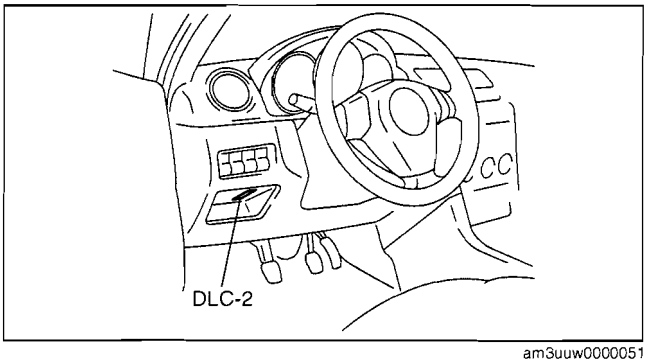
1. Turn the ignition switch to the ON position.
2. Verify the security light state.
   - If there is any malfunction:
     — After any malfunction is detected, the security light will function as follows **for approx. 1 min**.
       - DTC 16 and lower: Flashes
       - DTC 21 and higher: Illuminated
   - If there is no malfunction:
     — The security light illuminates **for approx. 3 s** and goes out.
3. When any malfunction has been detected, read DTCs via flashing patterns displayed after the security light flashes or is illuminated **for approx. 1 min**.
   - Perform troubleshooting according to the corresponding DTC inspection.

Note

- A verified DTC is flashed 10 times repeatedly by the security light.
- If multiple DTCs are verified, the security light displays only the smallest DTC.

M-MDS

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     — Select the "Toolbox" tab.
     — Select "Self Test".
     — Select "Modules".
     — Select "IC".
   - When using the PDS (Pocket PC)
     — Select "Module Tests".
     — Select "IC".
     — Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. Disconnect the M-MDS.



am3uuw0000051

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

DTC TABLE[IMMOBILIZER SYSTEM]

id0902e4800300

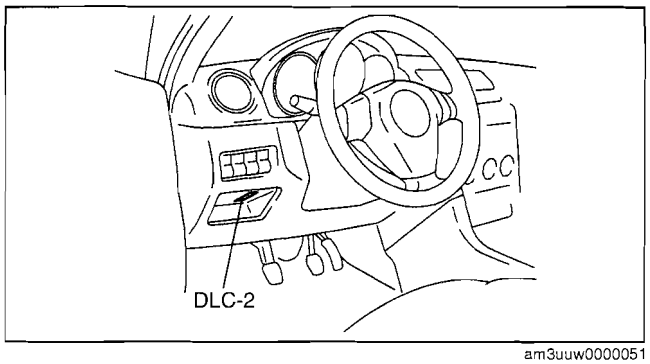
DTC				Detection condition	Page
Security light flashing pattern		M-MDS display*			
		Instrument cluster	PCM		
11		B1681	P1260	No detected communication with the coil antenna	09-02A-6 SECURITY LIGHT 11, DTC B1681/ P1260[IMMOBILIZER SYSTEM]
12		B2103	P1260	• Coil antenna malfunction • The PCM determined a malfunction in the coil antenna even though it is normal.	09-02A-8 SECURITY LIGHT 12, DTC B2103/ P1260[IMMOBILIZER SYSTEM]
13		B1600	P1260	The key ID number data cannot be read.	09-02A-8 SECURITY LIGHT 13, DTC B1600/ P1260[IMMOBILIZER SYSTEM]
		B2431	P1260	Key ID number registration error	09-02A-10 SECURITY LIGHT 13, DTC B2431/ P1260[IMMOBILIZER SYSTEM]
14		B1602	P1260	The instrument cluster cannot read key ID number data normally.	09-02A-11 SECURITY LIGHT 14, DTC B1602/ P1260[IMMOBILIZER SYSTEM]
15		B1601	P1260	The instrument cluster has detected unregistered key ID number.	09-02A-12 SECURITY LIGHT 15, DTC B1601/ P1260[IMMOBILIZER SYSTEM]
16		U2510	P1260	Communication error between the instrument cluster and the PCM (no response)	09-02A-12 SECURITY LIGHT 16, DTC U2510/ P1260, U1147/ P1260[IMMOBILIZER SYSTEM]
		U1147	P1260	Communication error between the instrument cluster and the PCM (mismatched conditions)	
21		B1213	P1260	Only one key ID number is registered.	09-02A-13 SECURITY LIGHT 21, DTC B1213/ P1260[IMMOBILIZER SYSTEM]
22		B2141	P1260	Communication error between the instrument cluster and the PCM (data transfer error)	09-02A-14 SECURITY LIGHT 22, DTC B2141/ P1260[IMMOBILIZER SYSTEM]
23		B2139	P1260	ID number data in the PCM and the instrument cluster do not match.	09-02A-15 SECURITY LIGHT 23, DTC B2139/ P1260[IMMOBILIZER SYSTEM]
Not illuminated		B1342	-	Instrument cluster malfunction	09-02A-15 DTC B1342[IMMOBILIZER SYSTEM]

* : The letters at the beginning of each DTC are only displayed when using the M-MDS, and refer to the following: B= Body system, P= Powertrain system, U= Network communication system.

PID/DATA MONITOR INSPECTION[IMMOBILIZER SYSTEM]

id0902e4400500

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     - — Select the "Toolbox" tab.
     - — Select "DataLogger".
     - — Select "Modules".
     - — Select "IC".
   - When using the PDS (Pocket PC)
     - — Select "Module Tests".
     - — Select "IC".
     - — Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000051

Note

- The PID data screen function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually.

PID/DATA MONITOR TABLE[IMMOBILIZER SYSTEM]

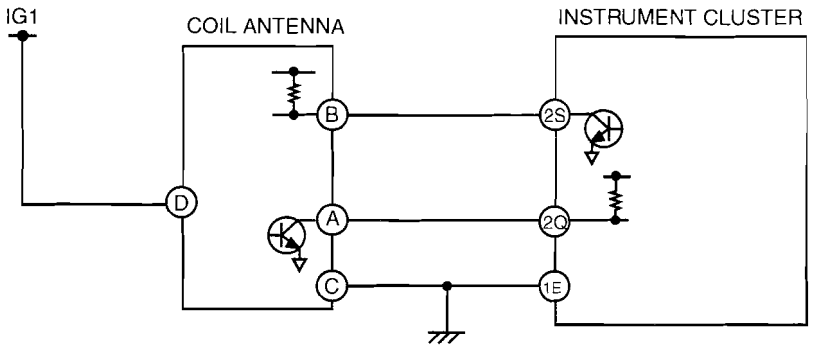
id0902e4800500

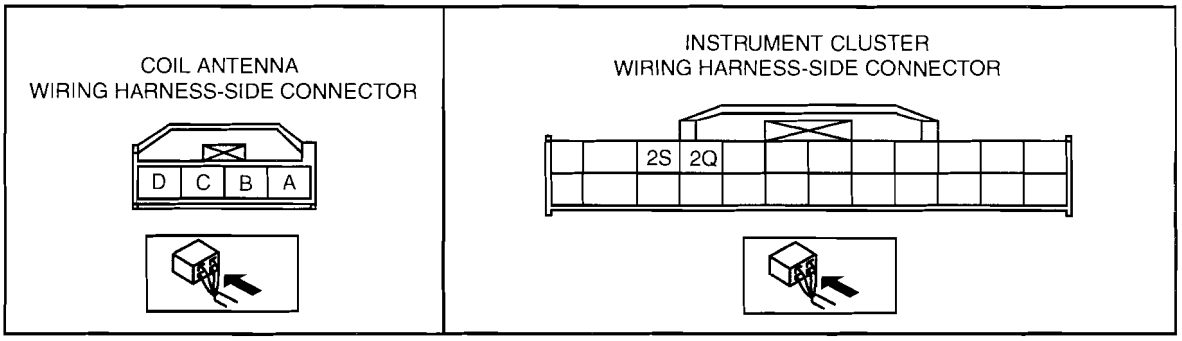
PID name (definition)	Detection condition
NUMKEYS (Number of key ID numbers registered in the instrument cluster)	Number of key ID numbers registered: 0—8

SECURITY LIGHT 11, DTC B1681/P1260[IMMOBILIZER SYSTEM]

id0902e4800600

SECURITY LIGHT: 11 **DTC: B1681/P1260**	No detected communication with the coil antenna
DETECTION CONDITION	• No detected communication with the coil antenna
POSSIBLE CAUSE	• Coil antenna malfunction • Instrument cluster malfunction • Malfunction in the related wiring harnesses





Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**INSPECT COIL ANTENNA POWER SUPPLY SYSTEM** • Disconnect the coil antenna connector. • Turn the ignition switch to the ON position. • Measure the voltage at coil antenna terminal D. — Is the voltage **8 V or more**?	Yes	Go to the next step.
		No	Repair the wiring harness.
2	**INSPECT WIRING HARNESS BETWEEN COIL ANTENNA AND GROUND** • Turn the ignition switch to the LOCK position. • Inspect the wiring harness between coil antenna terminal C and ground for the following: — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Go to the next step.
		No	Repair the wiring harness.
3	**INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT** • Connect the coil antenna connector. • Turn the ignition switch to the ON position. • Measure the voltage at coil antenna terminal B. — Is the voltage **8 V or more**?	Yes	Go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT** • Turn the ignition switch to the LOCK position. • Disconnect the instrument cluster connector. • Turn the ignition switch to the ON position. • Measure the voltage at instrument cluster terminal 2S. — Is the voltage **8 V or more**?	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	Go to the next step.
5	**INSPECT COMMUNICATION CIRCUIT (INPUT) FOR CONTINUITY** • Turn the ignition switch to the LOCK position. • Is there continuity between coil antenna terminal B and instrument cluster terminal 2S?	Yes	Go to the next step.
		No	Repair the wiring harness.
6	**INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT** • Measure the resistance between coil antenna terminal B and ground. — Is the resistance **10 kilohms or more**?	Yes	Replace the coil antenna. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	Repair the wiring harness.
7	**INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT** • Connect the coil antenna connector and the instrument cluster connector. • Turn the ignition switch to the ON position. • Measure the voltage at coil antenna terminal A. — Is the voltage **8 V or more**?	Yes	Replace the coil antenna. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	Go to the next step.
8	**INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT** • Turn the ignition switch to the LOCK position. • Disconnect the coil antenna connector. • Turn the ignition switch to the ON position. • Measure the voltage at coil antenna terminal A. — Is the voltage **8 V or more**?	Yes	Replace the coil antenna. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	Go to the next step.
9	**INSPECT COMMUNICATION CIRCUIT (OUTPUT) FOR CONTINUITY** • Turn the ignition switch to the LOCK position. • Disconnect the instrument cluster connector. • Is there continuity between coil antenna terminal A and instrument cluster terminal 2Q?	Yes	Repair the wiring harness.
		No	Go to the next step.
10	**INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT** • Measure the resistance between instrument cluster terminal 2Q and ground. — Is the resistance **10 kilohms or more**?	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	Repair the wiring harness.

SECURITY LIGHT 12, DTC B2103/P1260[IMMOBILIZER SYSTEM]

id0902e4800700

SECURITY LIGHT: 12 **DTC: B2103/P1260**	• Coil antenna malfunction • The PCM determined a malfunction in the coil antenna even though it is normal.
DETECTION CONDITION	• Coil antenna malfunction • The PCM determined a malfunction in the coil antenna even though it is normal.
POSSIBLE CAUSE	• Coil antenna malfunction • Poor connection of the coil antenna connector • PCM malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**INSPECT CONNECTOR CONNECTION** • Are the coil antenna connector and the instrument cluster connector securely connected?	Yes	Replace the coil antenna, then go to the next step. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	Connect the connector securely.
2	**INSPECT PCM** • Turn the ignition switch to the ON position. • Is the DTC displayed? — Security light: 12 — M-MDS: B2103/P1260	Yes	Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF. L3].) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 13, DTC B1600/P1260[IMMOBILIZER SYSTEM]

id0902e4800800

SECURITY LIGHT: 13 **DTC: B1600/P1260**	The key ID number data cannot be read.
DETECTION CONDITION	• The key ID number data cannot be read.
POSSIBLE CAUSE	• No transponder in the key • Transponder malfunction (Key ID number is not output) • Coil antenna malfunction • Instrument cluster malfunction • Any of the following items are touching or near the key head. — Spare keys — Keys for other vehicles equipped with an immobilizer system — Any metallic object — Any electronic device, or any credit or other cards with magnetic strips EXAMPLES:  METAL RING LYING ON KEY HEAD  METAL PART OF ANOTHER KEY TOUCHING KEY HEAD  KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC** • Is B1600/P1260 displayed?	Yes	Go to Step 3.
		No	Go to the next step.
2	**VERIFY DTC** • Is B2431/P1260 displayed?	Yes	Perform the DTC inspection for "SECURITY LIGHT: 13, M-MDS: B2431/P1260". (See 09-02A-10 SECURITY LIGHT 13, DTC B2431/P1260[IMMOBILIZER SYSTEM].)
		No	Go to the next step.
3	**VERIFY WHETHER KEY IS VALID OR NOT** • Are there any keys with which the engine can be started, other than the key that is a cause of the displayed DTC?	Yes	Go to Step 5.
		No	Go to the next step.
4	**VERIFY WHETHER MALFUNCTION IS IN KEY OR COIL ANTENNA** • Using the M-MDS, register an additional key. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Using the registered key, turn the ignition switch to the ON position. • Verify the DTC using the M-MDS. — Is B1600/P1260 displayed again?	Yes	Replace the coil antenna, then go to Step 6. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	• Dispose of the malfunctioning key. • Register a new key if necessary. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
5	**VERIFY WHETHER MALFUNCTION IS IN KEY OR COIL ANTENNA** • Using another valid key, turn the ignition switch to the ON position. • Verify the DTC Using the M-MDS. — Is B1600/P1260 displayed again?	Yes	Replace the coil antenna, then go to the next step. (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
		No	• Dispose of the malfunctioning key. • Register a new key if necessary. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
6	**INSPECT INSTRUMENT CLUSTER** • Using the registered key, turn the ignition switch to the ON position. — Is B1600/P1260 displayed again?	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 13, DTC B2431/P1260[IMMOBILIZER SYSTEM]

id0902e4800900

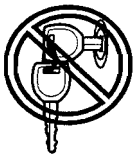
SECURITY LIGHT: 13 **DTC: B2431/P1260**	Key ID number registration error
DETECTION CONDITION	• Key ID number registration error
POSSIBLE CAUSE	• Errors during key ID number registration procedure • Any of the following items are touching or near the key head. — Spare keys — Keys for other vehicles equipped with an immobilizer system — Any metallic object — Any electronic device, or any credit or other cards with magnetic strips EXAMPLES:  METAL RING LYING ON KEY HEAD  METAL PART OF ANOTHER KEY TOUCHING KEY HEAD  KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC** • Is B2431/P1260 displayed?	Yes	Go to Step 3.
		No	Go to the next step.
2	**VERIFY DTC** • Is B1600/P1260 displayed?	Yes	Perform the DTC inspection for "SECURITY LIGHT: 13, M-MDS: B1600/P1260". (See 09-02A-8 SECURITY LIGHT 13, DTC B1600/P1260[IMMOBILIZER SYSTEM].)
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER** • Using the M-MDS, clear the key ID number and re-register it. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) **Note** • Two or more keys must be registered to start the engine. • Using the registered key, turn the ignition switch to the ON position. • Verify the DTC Using the M-MDS. — Is B2431/P1260 displayed again?	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 14, DTC B1602/P1260[IMMOBILIZER SYSTEM]

id0902e4801000

SECURITY LIGHT: 14 DTC: B1602/P1260	The instrument cluster cannot read key ID number data normally.
DETECTION CONDITION	• The instrument cluster cannot read key ID number data normally.
POSSIBLE CAUSE	• Transponder (key) malfunction • Coil antenna malfunction • Instrument cluster malfunction • Any of the following items are touching or near the key head. — Spare keys — Keys for other vehicles equipped with an immobilizer system — Any metallic object — Any electronic device, or any credit or other cards with magnetic strips EXAMPLES:  METAL RING LYING ON KEY HEAD  METAL PART OF ANOTHER KEY TOUCHING KEY HEAD  KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

09-02A

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY WHETHER KEY IS VALID OR NOT** • Using another registered key, turn the ignition switch to the ON position. • If there is not another registered key, register an additional key using the M-MDS and turn the ignition key to the ON position using the registered key. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Is the DTC displayed again? — Security light: 14 — M-MDS: B1602/P1260	Yes	Replace the coil antenna, then go to the next step. (See 09-14-16 COIL ANTENNA REMOVAL/ INSTALLATION.)
		No	• Dispose of the malfunctioning key. • Register a new key if necessary. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
2	**INSPECT INSTRUMENT CLUSTER** • Using another registered key, turn the ignition switch to the ON position. • Is the DTC displayed again? — Security light: 14 — M-MDS: B1602/P1260	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 15, DTC B1601/P1260[IMMOBILIZER SYSTEM]

id0902e4801100

SECURITY LIGHT: 15 DTC: B1601/P1260	The instrument cluster has detected unregistered key ID number.
DETECTION CONDITION	• The instrument cluster has detected unregistered key ID number.
POSSIBLE CAUSE	• No keys have been registered after replacing the instrument cluster. • Unregistered key used • Attempt made to register a ninth key • Instrument cluster malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY NUMBER OF REGISTERED KEYS** • Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys. (See 09-02A-5 PID/DATA MONITOR TABLE[IMMOBILIZER SYSTEM].) • Are one or more keys registered?	Yes	Go to the next step.
		No	Go to Step 3.
2	**VERIFY NUMBER OF REGISTERED KEYS** • Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys. (See 09-02A-5 PID/DATA MONITOR TABLE[IMMOBILIZER SYSTEM].) • Are eight keys registered?	Yes	Using the M-MDS, clear the key ID numbers as necessary, then go to the next step.
		No	Go to the next step.
3	**INSPECT INSTRUMENT CLUSTER** • Using the M-MDS, register the key ID number. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) **Note** • Two or more keys must be registered to start the engine. • Using the registered key, turn the ignition switch to the ON position. • Is the DTC displayed again? — Security light: 15 — M-MDS: B1601/P1260	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 16, DTC U2510/P1260, U1147/P1260[IMMOBILIZER SYSTEM]

id0902e4801200

SECURITY LIGHT: 16	DTC: U2510/P1260	Communication error between the instrument cluster and the PCM (no response)
	DTC: U1147/P1260	Communication error between the instrument cluster and the PCM (mismatched conditions)
DETECTION CONDITION		**Instrument cluster DTC: U2510** • Communication error between the instrument cluster and the PCM (no response) **Instrument cluster DTC: U1147** • Communication error between the instrument cluster and the PCM (mismatched conditions)
POSSIBLE CAUSE		• Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM • PCM malfunction • Instrument cluster malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC** • Are either U0073, or both, displayed, by either the instrument cluster or the PCM, or both?	Yes	Perform troubleshooting according to the corresponding DTC inspection. (See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
		No	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) Go to the next step.
2	**VERIFY DTC** • Using the registered key, turn the ignition switch to the ON position. • Is the DTC displayed? — Security light: 16 — M-MDS: U2510 or U1147/P1260	Yes	Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 21, DTC B1213/P1260[IMMOBILIZER SYSTEM]

id0902e4801300

SECURITY LIGHT: 21 **DTC: B1213/P1260**	Only one key ID number is registered.
DETECTION CONDITION	• Only one key is registered.
POSSIBLE CAUSE	• Only one registered key

09-02A

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY NUMBER OF REGISTERED KEYS** • Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys. (See 09-02A-5 PID/DATA MONITOR TABLE[IMMOBILIZER SYSTEM].) • Are two or more keys registered?	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	• Using the M-MDS, clear the key ID number and register a new key if necessary. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Go to the next step.
2	**VERIFY DTC** • Using the registered key, turn the ignition switch to the ON position. • Is the DTC displayed again? — Security light: 21 — M-MDS: B1213/P1260	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 22, DTC B2141/P1260[IMMOBILIZER SYSTEM]

id0902e4801400

SECURITY LIGHT: 22 **DTC: B2141/P1260**	Communication error between the instrument cluster and the PCM (data transfer error)
DETECTION CONDITION	• Communication error between the instrument cluster and the PCM (data transfer error)
POSSIBLE CAUSE	• Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM • Instrument cluster malfunction • PCM malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC** • Are either U1900 or U0073, or both displayed, by either the instrument cluster or the PCM, or both?	Yes	Perform troubleshooting according to the corresponding DTC inspection. (See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
		No	Go to the next step.
2	**VERIFY DTC** • Using the registered key, turn the ignition switch to the ON position. • Is the DTC displayed? — Security light: 22 — M-MDS: B2141/P1260	Yes	• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Go to the next step.
		No	DTC troubleshooting completed.
3	**EXAMINE INSTRUMENT CLUSTER AND PCM** • Is the DTC displayed again? — Security light: 22 — M-MDS: B2141/P1260	Yes	• Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Go to the next step.
		No	DTC troubleshooting completed.
4	**EXAMINE PCM** • Is the DTC displayed again? — Security light: 22 — M-MDS: B2141/P1260	Yes	• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

SECURITY LIGHT 23, DTC B2139/P1260[IMMOBILIZER SYSTEM]

id0902e4801500

SECURITY LIGHT: 23 DTC: B2139/P1260	ID number data in the PCM and the instrument cluster do not match.
DETECTION CONDITION	• ID number data in the instrument cluster and the PCM are different.
POSSIBLE CAUSE	• Necessary procedures were not performed using the M-MDS after replacing the PCM. • Instrument cluster malfunction • PCM malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY DTC** • Are either U1900 or U0073, or both, displayed, by either the instrument cluster or the PCM, or both?	Yes	Perform troubleshooting according to the corresponding DTC inspection. (See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
		No	Go to the next step.
2	**EXAMINE INSTRUMENT CLUSTER AND PCM** • Perform procedures for when replacing the PCM only. (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Using the registered key, turn the ignition switch to the ON position. • Is the DTC displayed? — Security light: 23 — M-MDS: B2139/P1260	Yes	• Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.) • Go to the next step.
		No	DTC troubleshooting completed.
3	**VERIFY DTC** • Is the DTC displayed again? — Security light: 23 — M-MDS: B2139/P1260	Yes	• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See 01-40A-13 PCM REMOVAL/INSTALLATION[LF, L3].) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

09-02A

DTC B1342[IMMOBILIZER SYSTEM]

id0902e4801600

DTC: B1342	Instrument cluster malfunction
DETECTION CONDITION	• Instrument cluster malfunction
POSSIBLE CAUSE	• Instrument cluster malfunction

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**EXAMINE INSTRUMENT CLUSTER AND PCM** • Is the DTC displayed? — M-MDS: B1342	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
		No	DTC troubleshooting completed.

09-02B ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM]

id0902e6830400

Outline

- If the controller area network (CAN) system is malfunctioning, read the DTCs of the following modules, using the M-MDS to determine the malfunctioning system.
  - — PCM
  - — TCM (FS5A-EL)
  - — EHPAS control module
  - — DSC HU/CM (with DSC)
  - — ABS HU/CM (with ABS)
  - — TPMS control module
  - — Instrument cluster
  - — Climate control unit
  - — SAS control module
  - — Audio unit (base module)
  - — Information display
  - — PJB

Flowchart

- Use the following flowchart to verify the cause of the trouble.

STEP	INSPECTION		ACTION
1	**INSPECT DTC INDICATION** • Using the M-MDS, inspect if DTCs are displayed for the following module: — PCM — TCM — EHPAS control module — DSC HU/CM — ABS HU/CM — TPMS control module — Instrument cluster — Climate control unit — SAS control module — PJB • Using the self-diagnostic function, inspect if DTCs are displayed for the following module: — Information display • Are any DTCs displayed?	Yes	Go to the next step.
		No	Go to Step 5.

STEP	INSPECTION		ACTION
2	**INSPECT CAN SYSTEM-RELATED DTC** • Are any DTCs other than the following displayed? — U0073 — U0100 — U0101 — U0121 — U0127 — U0131 — U0140 — U0151 — U0155 — U0164 — U0181 — U0184 — U0516 — U1900 — U2012 — U2023 — U2202 — U2516 — U2523	Yes	Repair the malfunctioning part by following the related DTC inspection. Go to the next step.
		No	Go to the next step.
3	**INSPECT CAN SYSTEM-RELATED DTC** • Are any of the following DTCs displayed? — PCM: U0073, U0101, U0121, U0155 — TCM: U0073, U0100 — EHPAS control module: U0073, U0100, U2023 — DSC HU/CM or ABS HU/CM: U1900, U2012, U2202, U2523 — TPMS control module: U0073 — Instrument cluster: U0073, U0100, U0101, U0121, U0127, U0131, U0140, U0151, U0184, U2516 — Climate control unit: U0140, U0155, U0184, U0516 — SAS control module: U0073, U1900 — Information display: U0164, U0181, U0184, U2516 — PJB: U1900	Yes	Repair the malfunctioning part by following the DTC inspection. Go to the next step.
		No	Troubleshooting completed.
4	**VERIFY TROUBLESHOOTING COMPLETED** • Clear the DTC from the CAN system-related modules using the M-MDS. • Start the engine. • Are any of the CAN related DTCs displayed?	Yes	Go back to Step 3.
		No	Troubleshooting completed.
5	**INSPECT COMMUNICATION CONDITION** • Is there a response from the following modules? — PCM — TCM — EHPAS control module — DSC HU/CM — ABS HU/CM — TPMS control module — Instrument cluster — Climate control unit — SAS control module — PJB	Yes	Troubleshooting completed.
		No	Go to the next step.
6	**INSPECT MODULES THAT DO NOT RESPOND** • Inspect the power supply and the ground circuit for any units that do not respond. • Are they normal?	Yes	Go to the next step.
		No	Repair the malfunctioning part, then go back to Step 1.

STEP	INSPECTION		ACTION
7	**INSPECT CONNECTOR AND WIRING HARNESS BETWEEN MODULES THAT DO NOT RESPOND AND DLC-2** • Turn the ignition switch to the LOCK position. • Inspect the wiring harness and connector between any module that does not respond and the DLC-2. **PCM—DLC-2** • 1AM—F • 1AI—E **TCM—DLC-2** • B—F • E—E **EHPAS control module—DLC-2** • 2B—F • 2H—E **DSC HU/CM—DLC-2** • P—F • D—E **ABS HU/CM—DLC-2** • H—F • L—E **Instrument cluster—DLC-2** • 1I—F • 1K—E • 1M—L • 1O—K **Climate control unit—DLC-2** • X—L • W—K **SAS control module—DLC-2** • 1X—L • 1T—K **PJB—DLC-2** • J-04 D—L • J-04 B—K	Yes	Go to the next step.
		No	Repair the malfunctioning part, then go back to Step 1.
8	**INSPECT WIRING HARNESS** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between the following terminals. — DLC-2 terminals F and E — DLC-2 terminals L and K • Is the voltage **2.0—3.0 V**?	Yes	Go to the next step.
		No	Go to Step 12.
9	**INSPECT WIRING HARNESS** • Turn the ignition switch to the LOCK position. • Measure the resistance between the following terminals. — DLC-2 terminals F and E — DLC-2 terminals L and K • Is the resistance **59—65 ohms**?	Yes	Replace the modules that do not respond, then go back to Step 1.
		No	Go to the next step.
10	**INSPECT PCM** • Disconnect the PCM connector. • Measure the resistance between following terminals. — PCM terminals 1AM and 1AI (part-side) • Is the resistance **118—130 ohms**?	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.
11	**INSPECT INSTRUMENT CLUSTER** • Disconnect the instrument cluster connector. • Measure the resistance between the following terminals. — Instrument cluster terminals 1I and 1K (part-side) — Instrument cluster terminals 1M and 1O (part-side) • Is the resistance **118—130 ohms**?	Yes	Go to next step.
		No	Replace the instrument cluster, then go to the next step.

STEP	INSPECTION		ACTION
12	**CLASSIFY WIRING HARNESS MALFUNCTION OR MODULE MALFUNCTION** • Turn the ignition switch to the LOCK position. • Disconnect the connector of any unit that does not respond. (If there are two or more units that do not respond, disconnect only one of the units.) • Turn the ignition switch to the ON position. • Measure the voltage between the following terminals. — DLC-2 terminals F and E — DLC-2 terminals L and K • Is voltage **2.0—3.0 V**?	Yes	Go to the next step.
		No	Retry this step with other module connector disconnected. If all units that do not respond are disconnected, go to Step 14.
13	**INSPECT WIRING HARNESS OF ANY UNIT THAT DOES NOT RESPOND** • Turn the ignition switch to the LOCK position. • Inspect for continuity between the following connector terminals of any disconnected unit. **PCM** • 1AM—other terminals • 1AI—other terminals **TCM** • B—other terminals • E—other terminals **EHPAS control module** • 2B—other terminals • 2H—other terminals **DSC HU/CM** • P—other terminals • D—other terminals **ABS HU/CM** • H—other terminals • L—other terminals **Instrument cluster** • 1I—other terminals • 1K—other terminals • 1M—other terminals • 1O—other terminals **Climate control unit** • X—other terminals • W—other terminals **SAS control module** • 1X—other terminals • 1T—other terminals **PJB** • J-04 D—other terminals • J-04 B—other terminals Is there continuity?	Yes	Repair or replace the wiring harness, then go back to Step 1.
		No	Replace the disconnected unit, then go back to Step 1.
14	**INSPECT CAN RELATED WIRING HARNESS** • Inspect the related wiring harnesses (CAN_L and/or CAN_H) for the short circuit (to power supply or ground). • Is the wiring harness normal?	Yes	Repair or replace the wiring harness, then go back to Step 1.
		No	Go back to Step 1.

DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM]

id0902e6837000

DTC	Malfunction location	DTC output module	Page
U0073	CAN system communication error	• PCM • TCM • EHPAS control module • TPMS control module • Instrument cluster	(See 09-02B-11 DTC U0073, U2012[MULTIPLEX COMMUNICATION SYSTEM].)
		SAS control module	(See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
U0100	Communication error to PCM	• TCM • EHPAS control module • Instrument cluster	(See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM].)
U0101	Communication error to TCM	• PCM • Instrument cluster	
U0121	Communication error to DSC HU/CM or ABS HU/CM	• PCM • Instrument cluster	
U0127	Communication error to instrument cluster	TPMS control module	
U0131	Communication error to EHPAS control module	Instrument cluster	
U0140	Communication error to PJB	• Instrument cluster • Climate control unit	
U0151	Communication error to SAS control module	Instrument cluster	
U0155	Communication error to instrument cluster	• PCM • Climate control unit	
U0164	Communication error to climate control unit	Information display	
U0181	Communication error to instrument cluster	Information display	
U0184	Communication error to audio unit (base module)	• Instrument cluster • Climate control unit • Information display	
U0516	CAN system communication error	Climate control unit	(See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
U1900	Communication error to PCM	• DSC HU/CM • ABS HU/CM	(See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM].)
	Communication error to instrument cluster	SAS control module	
	CAN system communication error Abnormal message from other modules	PJB	(See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM].) (See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
U2012	CAN system communication error	• DSC HU/CM • ABS HU/CM	(See 09-02B-11 DTC U0073, U2012[MULTIPLEX COMMUNICATION SYSTEM].)

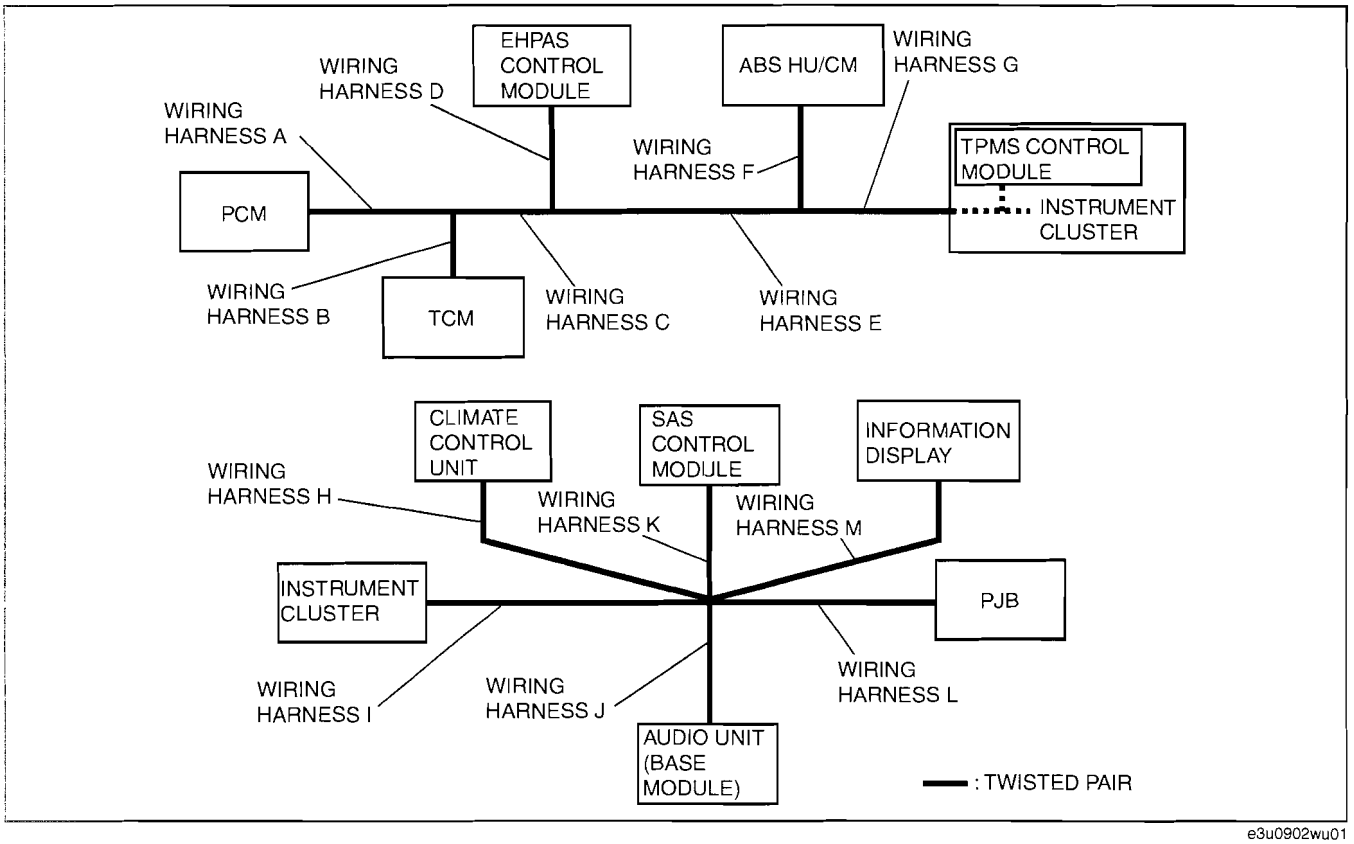
ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

DTC	Malfunction location	DTC output module	Page
U2023	Abnormal message from PCM	EHPAS control module	(See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLE X COMMUNICATION SYSTEM].)
	Abnormal message from other modules	Instrument cluster	
U2202	Communication error to PCM	DSC HU/CM	
U2516	CAN system communication error	• Instrument cluster • Information display	(See 09-02B-12 DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM].)
U2523	Communication error to PCM	• DSC HU/CM • ABS HU/CM	(See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLE X COMMUNICATION SYSTEM].)

PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM]

id0902e6830500

System Wiring Diagram



e3u0902wu01

PCM

1. Inspect the display of DTC U0101, U0121 and/or U0155, using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status			Malfunction location
	TCM	DSC HU/CM ABS HU/CM	Instrument cluster	
PCM	—	—	—	• Wiring harness A • PCM
	—	×	×	• Wiring harness B • TCM
	×	—	—	• Wiring harness C • Wiring harness E
	×	—	×	• Wiring harness F • DSC HU/CM • ABS HU/CM
	×	×	—	• Wiring harness G • Instrument cluster

TCM

1. Inspect the display of DTC U0100 using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status	Malfunction location
	PCM	
TCM	—	• Wiring harness A • Wiring harness B • TCM • PCM

EHPAS Control Module

1. Inspect the display of DTC U0100 and/or U2023, using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status	Malfunction location
	PCM	
EHPAS control module	—	• Wiring harness A • Wiring harness C • Wiring harness D • EHPAS control module • PCM

DSC HU/CM or ABS HU/CM

1. Inspect the display of DTC U1900, U2202 and/or U2523, using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status	Malfunction location
	PCM	
ABS HU/CM	—	• Wiring harness A • Wiring harness C • Wiring harness E • Wiring harness F • PCM

Instrument Cluster

1. Inspect the display of DTC U0100, U0101, U0121, U0127 and/or U0131 using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status					Malfunction location
	PCM	TCM	EHPAS control module	DSC HU/CM ABS HU/CM	TPMS control module	
instrument cluster	—	—	—	—	—	• Instrument cluster
	—	×	×	×	×	• Wiring harness A • PCM
	×	—	×	×	×	• Wiring harness B • TCM
	—	—	×	×	×	• Wiring harness C
	×	×	—	×	×	• Wiring harness D • EHPAS control module
	—	—	—	×	×	• Wiring harness E
	×	×	×	—	×	• Wiring harness F • DSC HU/CM • ABS HU/CM
	×	×	×	×	—	• TPMS control module

3. Inspect the display of DTC U0140, U0151 and/or U0184, using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
4. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status			Malfunction location
	PJB	SAS control module	Audio unit (base module)	
instrument cluster	—	—	—	• Wiring harness I • Instrument cluster
	—	×	×	• Wiring harness L • PJB
	×	—	×	• Wiring harness K • SAS control module
	×	×	—	• Wiring harness J • Audio unit (base module)

Climate Control Unit

1. Inspect the display of DTC U0140, U0155 and/or U0184, using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status			Malfunction location
	PJB	Instrument cluster	Audio unit (base module)	
Climate control unit	—	—	—	• Wiring harness H • Climate control unit
	—	×	×	• Wiring harness L • PJB
	×	—	×	• Wiring harness I • Instrument cluster
	×	×	—	• Wiring harness J • Audio unit (base module)

SAS Control Module

1. Inspect the display of DTC U1900 using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status	Malfunction location
	Instrument cluster	
SAS control module	—	• Wiring harness I • Wiring harness K • SAS control module • Instrument cluster

Information Display

1. Inspect the display of DTC U0164, U0181 and/or U0184 using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status			Malfunction location
	Climate control unit	Instrument cluster	Audio unit (base module)	
Information Display	—	—	—	• Wiring harness M • Information Display
	—	×	×	• Wiring harness H • Climate control unit
	×	—	×	• Wiring harness I • Instrument cluster
	×	×	—	• Wiring harness J • Audio unit (base module)

PJB

1. Inspect the display of DTC U1900 using the M-MDS. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal
—: Communication error

Module	Communication status	Malfunction location
	Audio unit (base module) Instrument cluster	
PJB	—	• Wiring harness I • Wiring harness J • Wiring harness L • PJB • Audio unit (base module) • Instrument cluster

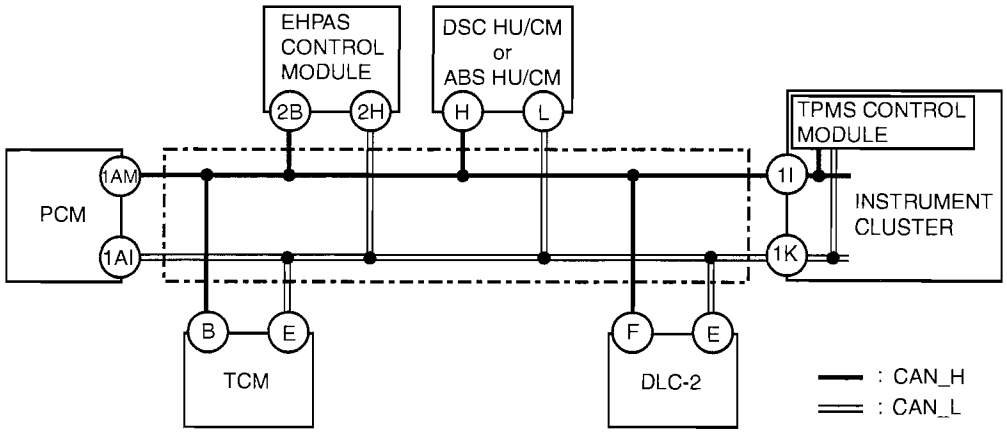
Repair Procedure

1. Inspect the connector of malfunctioning module.
   - If there is any malfunction, repair or replace the connector.
2. Inspect the malfunctioning wiring harnesses as follow:
   - If there is any malfunction, repair or replace the wiring harnesses.
   - If there is no malfunction, replace the malfunctioning module.
     - — Short to GND
     - — Short to power supply
     - — Twisted pair short each other
     - — Open circuit
3. Make sure to reconnect all disconnected connectors.
4. Clear the CAN system related DTCs using the M-MDS.
5. Verify if the CAN system related DTCs are displayed using the M-MDS.
   - If the same following DTCs are present, replace the malfunctioning module.
     - — U0073 (PCM, TCM, EHPAS control module, TPMS control module, instrument cluster, climate control unit, SAS control module)
     - — U0516 (TPMS control module, climate control unit)
     - — U1900 (PJB)
     - — U2012 (DSC HU/CM, ABS HU/CM)
     - — U2516 (Instrument cluster)
   - If other DTC is present, perform the appropriate DTC inspection. (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].)

DTC U0073, U2012[MULTIPLEX COMMUNICATION SYSTEM]

id0902e6830200

DTC	**U0073**	**PCM TCM EHPAS control module TPMS control module Instrument cluster**	**CAN system communication error**
	U2012	**DSC HU/CM ABS HU/CM**	
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only detection conditions may cause injury due to operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • CAN system related harness malfunction • Related module communication error		
POSSIBLE CAUSE	• Open or short circuit in wiring harness • Malfunction of connectors between PCM, TCM, EHPAS control module, DSC HU/CM, ABS HU/CM TPMS control module, and instrument cluster • PCM malfunction • TCM malfunction • EHPAS control module malfunction • TPMS control module malfunction • DSC HU/CM malfunction • ABS HU/CM malfunction • Instrument cluster malfunction		



09-02B

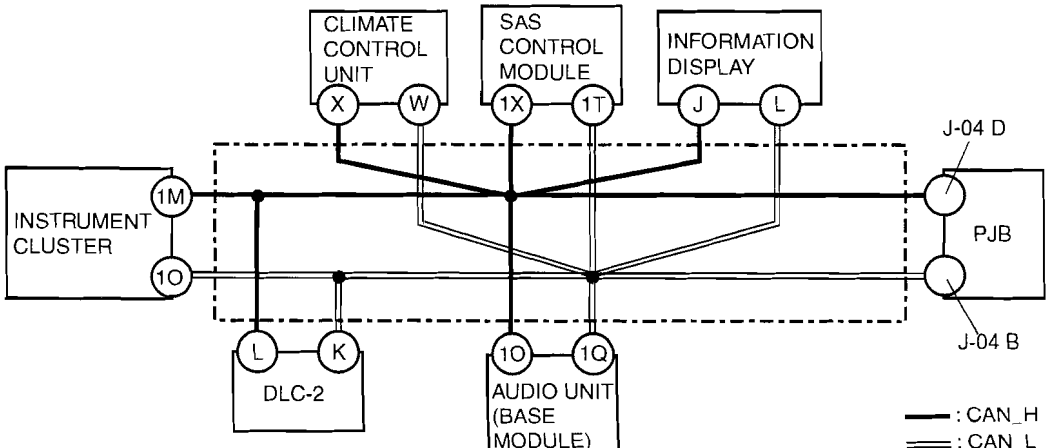
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CAN SYSTEM-RELATED DTC** • Are any DTCs other than the following displayed? — U0073 — U2012	Yes	Determine malfunctioning part in CAN system. (See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM])
		No	Go to the next step.
2	**INSPECT CONNECTOR** • Inspect the connector of the module that outputs the DTC. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 4.
3	**INSPECT WIRING HARNESSES** • Inspect for the following malfunctioning wiring harnesses: — Short to GND — Short to power supply — Twisted pair short each other — Open circuit • Is there any malfunction?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC using the M-MDS. • Is the same DTC present?	Yes	Replace the module that outputs the DTC, then retry this step.
		No	Troubleshooting completed.

DTC U0073, U0516, U1900, U2516[MULTIPLEX COMMUNICATION SYSTEM]

id0902e6833800

DTC	**U0073**	**SAS control module**	**CAN system communication error**
	U0516	**Climate control unit**	
	U1900	**PJB**	
	U2516	**Instrument cluster Information display**	
DETECTION CONDITION	**Warning** • **Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only detection conditions may cause injury due to operating error, or damage the system. When performing an inspection, always follow the inspection procedure.** • CAN system related harness malfunction • Related module communication error		
POSSIBLE CAUSE	• Open or short circuit in wiring harness • Malfunction of connectors between SAS control module, PJB, information display and instrument cluster • SAS control module malfunction • Climate control unit • Information display malfunction • PJB malfunction • Instrument cluster malfunction		



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CAN SYSTEM-RELATED DTC** • Are any DTCs other than the following displayed? — U0073 — U0516 — U1900 — U2516	Yes	Determine malfunctioning part in CAN system. (See 09-02B-7 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION[MULTIPLEX COMMUNICATION SYSTEM].)
		No	Go to the next step.
2	**INSPECT CONNECTOR** • Inspect the connector of the module that outputs the DTC. • Is it normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 4.
3	**INSPECT WIRING HARNESSES** • Inspect for the following malfunctioning wiring harnesses: — Short to GND — Short to power supply — Twisted pair short each other — Open circuit • Is there any malfunction?	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
4	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC using the M-MDS. • Is the same DTC present?	Yes	Replace the module that outputs the DTC, then retry this step.
		No	Troubleshooting completed.

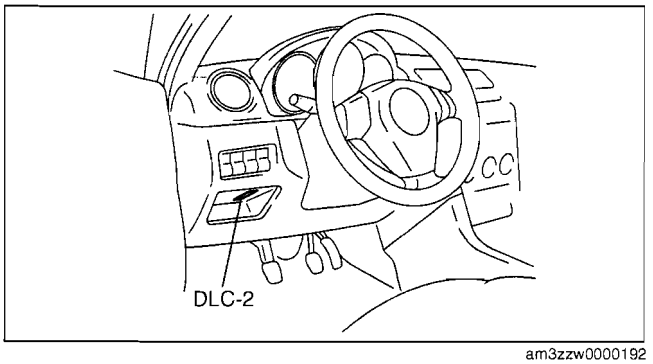
09-02C ON-BOARD DIAGNOSTIC [INSTRUMENT CLUSTER]

DTC INSPECTION[INSTRUMENT CLUSTER]

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   When using the IDS (laptop PC)
   - Select the "Toolbox" tab.
   - Select "Self Test".
   - Select "Modules".
   - Select "IC".

   When using the PDS (Pocket PC)
   - Select "Module Tests".
   - Select "IC".
   - Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the instrument cluster.

id0902e8800200



am3zzw0000192

ON-BOARD DIAGNOSTIC [INSTRUMENT CLUSTER]

DTC TABLE[INSTRUMENT CLUSTER]

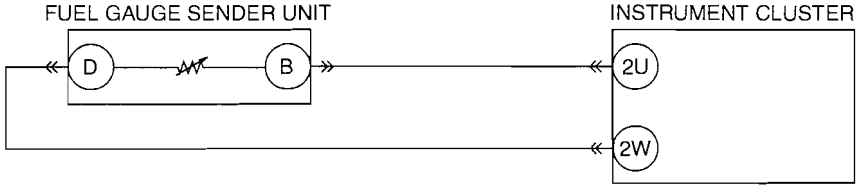
id0902e8800300

DTC	Malfunction location	Freeze frame data	Page
B1202	Fuel gauge sender unit circuit malfunction (open circuit)	—	(See 09-02C-3 DTC B1202[INSTRUMENT CLUSTER].)
B1204	Fuel gauge sender unit circuit malfunction (short to GND)	—	(See 09-02C-4 DTC B1204[INSTRUMENT CLUSTER].)
B1342	Instrument cluster malfunction	—	(See 09-02C-5 DTC B1342[INSTRUMENT CLUSTER].)
B2477	Configuration error	—	(See 09-02C-5 DTC B2477[INSTRUMENT CLUSTER].)
U0073	CAN system communication error (HS-CAN)	—	(See 09-02B-1 MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM].)
U0100	Communication error to PCM	×	
U0101	Communication error to TCM	×	
U0121	Communication error to ABS HU/CM or DSC HU/CM	×	
U0127	Communication error to TPMS control module	—	
U0131	Communication error to EHPAS control module	×	
U0140	Communication error to PJB	—	
U0151	Communication error to SAS control module	×	
U2023	Abnormal message from other module	×	
U2064	Warning light illumination request signal from other modules	×	(See 09-02C-6 DTC U2064[INSTRUMENT CLUSTER].)
U2516	CAN system communication error (MS-CAN)	—	(See 09-02B-1 MULTIPLEX COMMUNICATION SYSTEM[MULTIPLEX COMMUNICATION SYSTEM].)

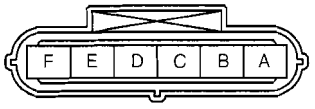
DTC B1202[INSTRUMENT CLUSTER]

id0902e8840200

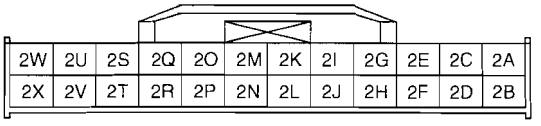
DTC B1202	Fuel gauge sender unit circuit malfunction (open circuit)
DETECTION CONDITION	• The resistance between instrument cluster and fuel gauge sender unit is **more than 600 ohms** for **5 s.**
POSSIBLE CAUSE	• Open circuit in wiring harness between instrument cluster and fuel gauge sender unit • Fuel gauge sender unit malfunction • Instrument cluster malfunction

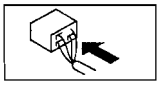


FUEL GAUGE SENDER UNIT WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





09-02C

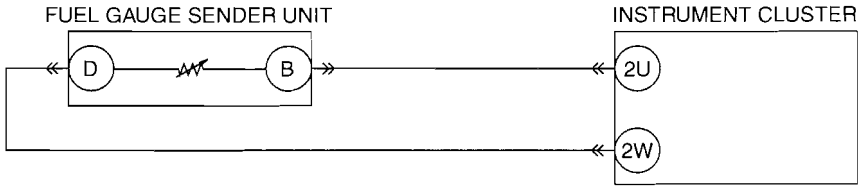
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FUEL GAUGE** • Perform the check code 23 inspection. • Is there any malfunction?	Yes	Replace the instrument cluster.
		No	Go to the next step.
2	**INSPECT INSTRUMENT CLUSTER CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the instrument cluster connector. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
3	**INSPECT FUEL GAUGE SENDER UNIT CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the fuel gauge sender unit connector. • Inspect the fuel gauge sender unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
4	**INSPECT WIRING HARNESS** • Turn the ignition switch to the LOCK position. • Inspect for continuity between following terminals: — Instrument cluster terminal 2U — fuel gauge sender unit terminal B (wiring harness-side) — Instrument cluster terminal 2W — fuel gauge sender unit terminal D (wiring harness-side) • Is there continuity?	Yes	Inspect the fuel gauge sender unit. • Repair or replace if necessary.
		No	Repair or replace the wiring harness.

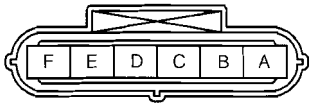
DTC B1204[INSTRUMENT CLUSTER]

id0902e8840300

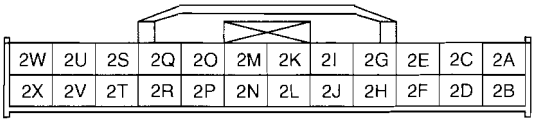
DTC B1204	Fuel gauge sender unit circuit malfunction (short to GND)
DETECTION CONDITION	• The resistance between instrument cluster and fuel gauge sender unit is **less than 6 ohms** for **5 s**.
POSSIBLE CAUSE	• Short to GND in wiring harness between instrument cluster and fuel gauge sender unit • Wiring harness between instrument cluster and fuel gauge sender unit short each other • Fuel gauge sender unit malfunction • Instrument cluster malfunction

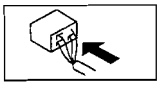


FUEL GAUGE SENDER UNIT WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FUEL GAUGE** • Perform the check code 23 inspection. • Is there any malfunction?	Yes	Replace the instrument cluster.
		No	Go to the next step.
2	**INSPECT INSTRUMENT CLUSTER CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the instrument cluster connector. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
3	**INSPECT FUEL GAUGE SENDER UNIT CONNECTOR** • Turn the ignition switch to the LOCK position. • Disconnect the fuel gauge sender unit connector. • Inspect the fuel gauge sender unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
4	**INSPECT WIRING HARNESS** • Turn the ignition switch to the LOCK position. • Inspect for continuity between following terminals: — Instrument cluster terminal 2U (wiring harness-side) — body GND — Instrument cluster terminal 2W (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT WIRING HARNESS** • Turn the ignition switch to the LOCK position. • Inspect for continuity between following terminals: — Instrument cluster terminal 2U — instrument cluster terminal 2W (wiring harness-side) • Is there continuity?	Yes	Repair or replace the wiring harness.
		No	Inspect the fuel gauge sender unit. • Repair or replace if necessary.

DTC B1342[INSTRUMENT CLUSTER]

id0902e8840400

DTC B1342	• **Instrument cluster malfunction**
DETECTION CONDITION	• Malfunction in the instrument cluster internal circuit
POSSIBLE CAUSE	• Instrument cluster malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT INSTRUMENT CLUSTER** • Clear the DTC from the memory. • Turn the ignition switch to the LOCK position. • Turn the ignition switch to the ON position. • Is B1342 displayed?	Yes	Replace the instrument cluster.
		No	DTC troubleshooting completed.

09-02C

DTC B2477[INSTRUMENT CLUSTER]

id0902e8840500

DTC B2477	• **Configuration error**
DETECTION CONDITION	• Configuration error • Malfunction in the instrument cluster internal circuit
POSSIBLE CAUSE	• Instrument cluster malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**PERFORM INSTRUMENT CLUSTER CONFIGURATION** • Perform instrument cluster configuration. • Is B2477 displayed?	Yes	Replace the instrument cluster.
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING OF DTC B2477 COMPLETED** • Clear the DTC from the memory. • Is B2477 displayed?	Yes	Go to the applicable DTC inspection.
		No	DTC troubleshooting completed.

DTC U2064[INSTRUMENT CLUSTER]

id0902e8840600

DTC U2064	Warning light illumination request signal from other modules
DETECTION CONDITION	• Receive warning light illumination request signal
POSSIBLE CAUSE	• CAN-related module malfunction

Diagnostic Procedure

1. Verify the freeze frame data.
2. Determine which unit is thought to be malfunctioning based on the freeze frame data.

Note

- If several warning light illumination requests are received, they will be recorded in one freeze frame data.
- Performing the active command mode inspection for ABS/DSC while the engine is running could result in the DTC U2064 being stored in the instrument cluster.

Freeze frame data		Warning light illumination request unit		
		PCM	ABS HU/CM DSC HU/CM	SAS control module
Illuminated warning light	Air bag system warning light	—	—	×
	Generator warning light	×	—	—
	MIL	×	—	—
	ABS warning light	—	×	—
	Brake system warning light	—	—	—
	AT warning light	×	—	—
Meter, gauge control status	Speedometer	—	—	—
	Tachometer	—	—	—
	Water temperature gauge	—	—	—

3. Inspect the malfunctioning part.
   - Repair or replace if necessary.
4. Clear the DTC from the memory.
5. Turn the ignition switch to the LOCK position.
6. Turn the ignition switch to the ON position.
7. Verify that the DTC U2064 is displayed using the M-MDS.
   - If DTC U2064 is displayed, go back to Step 1.

09-02D ON-BOARD DIAGNOSTIC [AUDIO]

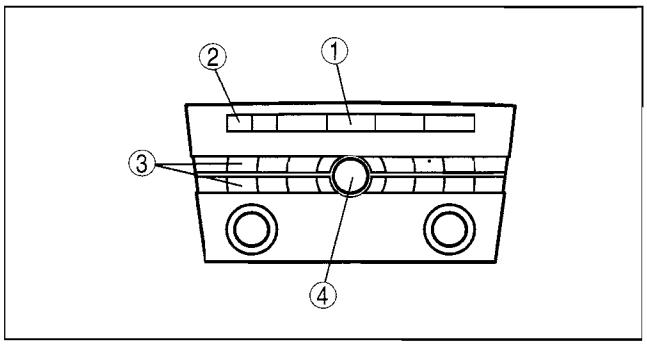
STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE[AUDIO]

id0902f6803700

Note
- All DTCs displayed in the on-board diagnostic test mode should be entered in the Audio Repair Order Form.

1. Turn the ignition switch to the ACC or ON position.
2. While pressing the POWER button, simultaneously press the AM button and the CLOCK button for **2 s or more**.

1	AM button
2	CLOCK button
3	SEEK button
4	POWER button



c3u0902wm01

Note
- If several DTCs are in the memory, they can be displayed using the SEEK button.

3. To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.

ON-BOARD DIAGNOSTIC [AUDIO]

SUPPLIER IDENTIFICATION PROCEDURE[AUDIO]

id0902f6803800

Note
- The supplier can vary with the module. When asking the supplier (service center) for repair or replacement, identify the supplier and fill in the Audio Repair Order Form with the following procedures.

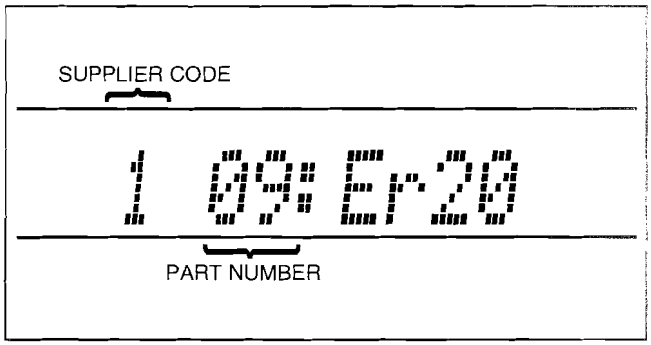
Identification Using the Label or Inscribed Lettering

1. Remove the audio unit.
2. Verify the supplier by referring to the label attached to each unit.

Identification Using the On-board Diagnostic Test Mode.

1. Start the on-board diagnostic test mode.
2. Identify the device and supplier codes by referring to the LCD display.

Note
- If no DTC is stored, no codes will be displayed.



CHU0902WM02

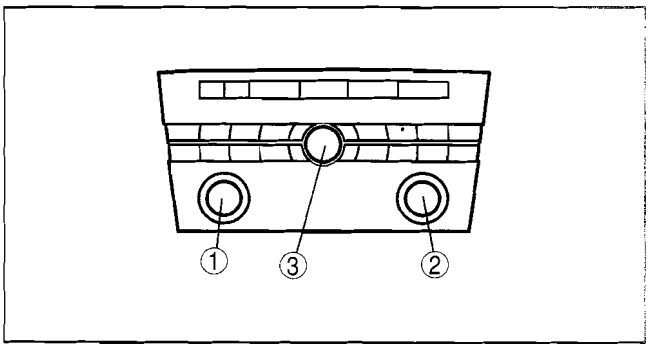
Supplier code	Supplier name
1	FMS audio
2	Panasonic
3	CLARION

Part number	Part name
00	Cassette deck
03	CD player
05	CD changer (external)
06	CD changer (upper module)
07	MD player
09	Base unit
10	MP3 applicable CD player system

MEMORY CLEARING PROCEDURE[AUDIO]

id0902f6803900

1. Start the on-board diagnostic test mode.
2. While pressing the POWER button, simultaneously press the AUDIO CONT button for **2 s or more.**



B3E0902WM04

1	AUDIO CONT button (without RDS)
2	AUDIO CONT button (with RDS)
3	POWER button

Caution
- **Before clearing the memory, be sure to enter all of the DTCs displayed in the on-board diagnostic test mode in the Audio Repair Order Form.**

3. To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.

DTC TABLE[AUDIO]

id0902f6800300

Screen display		System malfunction location
DTC (When starting on-board diagnostic test function)	Error message (When error is found)	
09: Er22	—	Base unit (peripheral circuit for tuner)
09: Er20	—	Power supply circuit to base unit
00: Er10	—	Cassette deck communication circuit system
03: Er10	—	CD player communication circuit system
05: Er10	—	CD changer (external) communication circuit system
06: Er10	—	CD changer (upper module) communication circuit system
07: Er10	—	MD player communication circuit system
03: Er01	—	CD player system
03: Er02	CHECK CD	CD player system
03: Er07	CHECK CD	CD player system
00: Er01	—	Cassette deck system
00: Er03	—	Cassette deck system
00: Er04	CHECK TAPE	Cassette tape system
05: Er01	—	CD changer (external) system
05: Er07	CHECK CD	CD changer (external) system
06: Er01	—	CD changer (upper module) system
06: Er02	CHECK CD	CD changer (upper module) system
06: Er07	CHECK CD	CD changer (upper module) system
07: Er01	—	MD player system
07: Er02	CHECK MD	MD player system
07: Er07	CHECK MD	MD player system
07: Er08	CHECK MD	MD system
10: Er01	—	MP3 applicable CD player system
10: Er02	CHECK CD	MP3 applicable CD player system
no Er	—	No DTCs stored

DTC 09:ER22[AUDIO]

id0902f6818600

DTC 09:Er22	Base unit (peripheral circuit for tuner)
DETECTION CONDITION	• Base unit detects malfunction in inner circuit (related to tuner).
POSSIBLE CAUSE	• Base unit malfunction

Diagnostic procedure

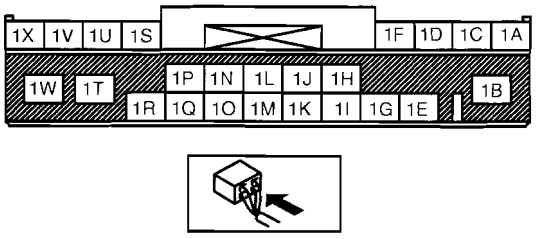
INSPECTION		ACTION
Clear the DTC and operate the radio for **3 s or more**. Is DTC 09: Er22 indicated?	Yes	Replace the base unit.
	No	DTC troubleshooting completed.

DTC 09:ER20[AUDIO]

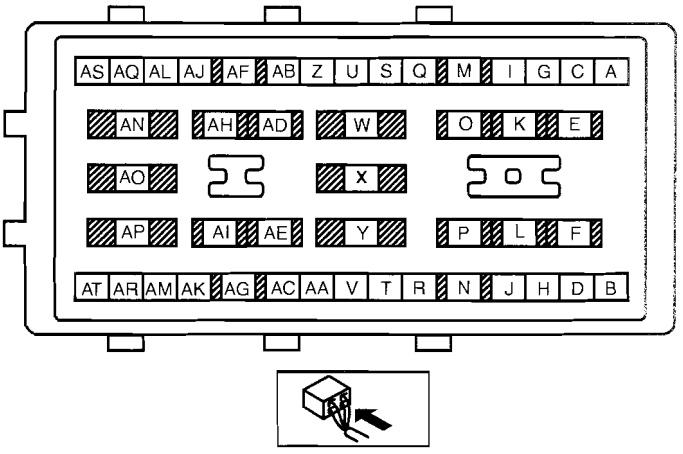
id0902f6818500

DTC 09:Er20	Power supply circuit of base unit
DETECTION CONDITION	• Voltage detected at base unit terminals 1B and 1R is **less than 8.5 V, or more than 16 V (must not be 16V).**
POSSIBLE CAUSE	• Weak battery • Malfunction in wiring harness between battery and base unit

BASE UNIT



PJB



Diagnostic procedure

STEP	INSPECTION		ACTION
1	Remove the ROOM 15 A fuse and METER 7.5 A fuse. Are the fuses normal?	Yes	Go to the next step.
		No	Inspect related wiring harness, then replace the fuse.
2	Measure the battery voltage. — Is the voltage between **8.5—16 V**?	Yes	Go to the next step.
		No	Battery malfunction Inspect the charge/discharge system.
3	Measure the voltage between PJB terminal J-03 P and base unit terminal 1B. — Is the voltage between **8.5—16 V**?	Yes	Go to the next step.
		No	Inspect fuses and related wiring harness between the battery and PJB. • If there is malfunction, repair or replace the applicable part.
4	Install the ROOM 15 A fuse and METER 7.5 A fuse. Turn the ignition switch to the ACC position. Measure the voltage at the base unit terminals 1B and 1R. — Is the voltage between **8.5—16 V**?	Yes	Go to the next step.
		No	Repair the wiring harness between the PJB and base unit.
5	Turn the ignition switch to the ACC or ON position and hold for **30 s or more**. Is DTC 09: Er20 displayed?	Yes	Replace the base unit.
		No	DTC troubleshooting completed.

DTC 00:ER10[AUDIO]

id0902f6817100

DTC 00:Er10	Cassette deck—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with cassette deck.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and cassette deck • Cassette deck malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Remove the cassette deck and verify the connector condition (bent pins, poor female terminal connection, trapped foreign material) Is the connector normal?	Yes	Go to the next step.
		No	Repair the connector and go to the next step.
2	Assemble the cassette deck to the base unit and verify the assembly condition. Is the assembly condition normal?	Yes	Go to the next step.
		No	Repair the assembly and go to the next step.
3	Clear the DTC, turn the ignition switch to the ON position and then hold for **3 s or more**. Is DTC 00: Er10 displayed?	Yes	Replace the base unit and cassette deck.
		No	DTC troubleshooting completed.

DTC 03:ER10[AUDIO]

id0902f6817500

DTC 03:Er10	CD player—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with CD player.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and CD player • CD player malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Remove the CD player and verify the connector condition (bent pins, poor female terminal connection, trapped foreign material). Is the connector normal?	Yes	Go to the next step.
		No	Repair the connector and go to the next step.
2	Assemble the CD player to the base unit and verify assembly condition. Is assembly condition normal?	Yes	Go to the next step.
		No	Repair the assembly condition and go to the next step.
3	Clear the DTC, turn the ignition switch to the ON position and then hold for **3 s or more**. Is DTC 03: Er10 displayed?	Yes	Replace the base unit and CD player.
		No	DTC troubleshooting completed.

ON-BOARD DIAGNOSTIC [AUDIO]

DTC 06:ER10[AUDIO]

id0902f6817900

DTC 06:Er10	CD changer (upper module)—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with CD changer (upper module).
POSSIBLE CAUSE	• Malfunction of connectors between base unit and CD changer (upper module) • CD changer (upper module) malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify the connections of the base unit and CD changer connectors. Are the connections normal?	Yes	Go to the next step.
		No	Repair the connections and go to the next step.
2	Inspect the wiring harness between the base unit and CD changer (external). Is the wiring harness normal?	Yes	Go to the next step.
		No	Repair the wiring harness and go to the next step.
3	Clear the DTC, turn the ignition switch to the ON position and then hold for **3 s or more**. Is DTC 06: Er10 displayed?	Yes	Replace the base unit and CD changer (external).
		No	DTC troubleshooting completed.

DTC 07:ER10[AUDIO]

id0902f6818400

DTC 07:Er10	MD player—base unit communication line
DETECTION CONDITION	• Base unit detects communication error with MD player.
POSSIBLE CAUSE	• Malfunction of connectors between base unit and MD player • MD player malfunction • Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Remove the MD player and inspect the connector condition (bent pins, poor female terminal connection, trapped foreign material). Is the connector normal?	Yes	Go to the next step.
		No	Repair the connector and go to the next step.
2	Assemble the MD player to the base unit and verify assembly condition. Is assembly condition normal?	Yes	Go to the next step.
		No	Repair the assembly condition and go to the next step.
3	Clear the DTC, turn the ignition switch to the ON position and then hold for **3 s or more**. Is DTC 07: Er10 displayed?	Yes	Replace the base unit and MD player.
		No	DTC troubleshooting completed.

DTC 03:ER01[AUDIO]

id0902f6817200

DTC 03:Er01	CD player
DETECTION CONDITION	• CD player cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective CD (broken or foreign material stuck/attached) • CD player malfunction

STEP	INSPECTION		ACTION
1	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material) or replace the CD, and go to the next step.
2	Clear the DTC. Insert then eject a normal CD. Is DTC 03: Er01 displayed?	Yes	Replace the CD player.
		No	DTC troubleshooting completed.

DTC 03:ER02[AUDIO]

id0902f6817300

DTC 03:Er02	CD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD player malfunction

STEP	INSPECTION		ACTION	
1	Play the CD and change tracks. Can tracks be changed?	Yes	Go to Step 3.	
		No	Cannot change to specific tracks.	Go to the next step.
			Cannot change to any track.	Replace the CD and try to change tracks again. • If the function is normal, go to Step 3. • If the function is not normal, replace the CD player.
2	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.	
		No	Repair (remove foreign material, clean) or replace the CD, and go to the next step.	
3	Clear the DTC. Play the CD and change tracks. Is DTC 03: Er02 displayed?	Yes	Replace the CD player.	
		No	DTC troubleshooting completed.	

09-02D

DTC 03:ER07[AUDIO]

id0902f6817400

DTC 03:Er07	CD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Base unit detects CD reading error.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material, clean) or replace the CD, and go to the next step.
2	Clear the DTC and insert a normal CD. Play the CD. Is DTC 03: Er07 displayed?	Yes	Replace the CD player.
		No	DTC troubleshooting completed.

DTC 00:ER01[AUDIO]

id0902f6816800

DTC 00:Er01	Cassette deck
DETECTION CONDITION	• Cassette deck cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective cassette tape (deformation, broken, or foreign material stuck/attached) • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Can cassette tape be ejected?	Yes	Go to the next step.
		No	Replace the cassette deck.
2	Verify condition of the cassette tape when the error occurs. Is the cassette tape normal?	Yes	Go to the next step.
		No	Repair (remove foreign material) or replace the cassette tape, and go to the next step.
3	Clear the DTC. Insert then eject a normal cassette tape. Is DTC 00: Er01 displayed?	Yes	Replace the cassette deck.
		No	DTC troubleshooting completed.

DTC 00:ER03[AUDIO]

id0902f6816900

DTC 00:Er03	Cassette deck
DETECTION CONDITION	• Base unit detects that reel built into cassette deck does not operate.
POSSIBLE CAUSE	• Defective cassette tape (tape slack, pinched tape in internal cassette deck) • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify condition of the cassette tape when the error occurs. Is the cassette tape normal?	Yes	Go to the next step.
		No	Repair (tighten slack, clear pinched tape inside cassette deck) or replace the cassette tape, and go to the next step.
2	Clear the DTC, and then insert a normal cassette tape. Play the cassette tape for **20 s or more**. Is DTC 00: Er03 displayed?	Yes	Replace the cassette deck.
		No	DTC troubleshooting completed.

DTC 00:ER04[AUDIO]

id0902f6817000

DTC 00:Er04	Cassette tape
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK TAPE" is displayed in the LCD. • Cassette tape is worn out.
POSSIBLE CAUSE	• Tape wear • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify condition of the cassette tape when the error occurs. Is the cassette tape normal?	Yes	Go to the next step.
		No	Replace the cassette tape and go to the next step.
2	Clear the DTC, and then insert a normal cassette tape. Play the cassette tape for **20 s or more**. Is DTC 00: Er04 displayed?	Yes	Replace the cassette deck.
		No	DTC troubleshooting completed.

DTC 06:ER01[AUDIO]

id0902f6817600

DTC 06:Er01	CD changer (upper module)
DETECTION CONDITION	• CD changer (upper module) cannot implement insert, eject, and disc change commands.
POSSIBLE CAUSE	• Defective CD (broken or foreign material stuck/attached) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Can CD be ejected?	Yes	Go to the next step.
		No	Replace the CD changer (upper module).
2	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material) or replace the CD, and go to the next step.
3	Clear the DTC. Insert then eject a normal CD. Is DTC 06: Er01 displayed?	Yes	Replace the CD changer (upper module).
		No	DTC troubleshooting completed.

DTC 06:ER02[AUDIO]

id0902f6817700

DTC 06:Er02	CD changer (upper module)
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	Play all the CDs in the changer and change tracks. Can tracks be changed?	Yes	Go to Step 3.	
		No	Cannot change to specific tracks.	Go to the next step.
			Cannot change to any track.	Change the CD and try to change tracks again. • If the function is normal, go to Step 3. • If the function is not normal, replace the CD changer (upper module).
2	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.	
		No	Repair (remove foreign material, clean) or replace the CD, and go to the next step.	
3	Clear the DTC. Play the CD and change tracks. Is DTC 06: Er02 displayed?	Yes	Replace the CD changer (upper module).	
		No	DTC troubleshooting completed.	

DTC 06:ER07[AUDIO]

id0902f6817800

DTC 06:Er07	CD changer (upper module)
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Base unit detects CD reading error.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	Play all the CDs in the changer. Are they read normally?	Yes	Go to Step 3.	
		No	Cannot read specific CDs.	Go to the next step.
			Cannot read any CD.	Go to Step 3.
2	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.	
		No	Repair (remove foreign material, clean) or replace the CD, and go to the next step.	
3	Clear the DTC, and then insert a normal CD. Play the CD for **12 s or more**. Is DTC 06: Er07 displayed?	Yes	Replace the CD changer (upper module).	
		No	DTC troubleshooting completed.	

DTC 07:ER01[AUDIO]

id0902f6818000

DTC 07:Er01	MD player
DETECTION CONDITION	• MD player cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective MD (broken or foreign material stuck/attached) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Can MD be ejected?	Yes	Go to the next step.
		No	Replace the MD player.
2	Verify the condition of the MD when the error occurs. Is the MD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material) or replace the MD, and go to the next step.
3	Clear the DTC. Insert then eject a normal MD. Is DTC 07: Er01 displayed?	Yes	Replace the MD player.
		No	DTC troubleshooting completed.

DTC 07:ER02[AUDIO]

id0902f6818100

DTC 07:Er02	MD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK MD" is displayed in the LCD. • Cannot play MD normally or change tracks.
POSSIBLE CAUSE	• Defective MD (scratches or dirt) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION	
1	Play the MD and change tracks. Can tracks be changed?	Yes	Go to Step 3.	
		No	Cannot change to specific tracks.	Go to the next step.
			Cannot change to any track.	Change the MD and try to change tracks again. • If the function is normal, go to Step 3. • If the function is not normal, replace the MD player.
2	Verify the condition of the MD when the error occurs. Is the MD normal?	Yes	Go to the next step.	
		No	Repair (remove foreign material, clean) or replace the MD, and go to the next step.	
3	Clear the DTC. Play the MD and change tracks. Is DTC 07: Er02 displayed?	Yes	Replace the MD player.	
		No	DTC troubleshooting completed.	

DTC 07:ER07[AUDIO]

id0902f6818200

DTC 07:Er07	MD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK MD" is displayed in the LCD. • Base unit detects MD reading error.
POSSIBLE CAUSE	• Defective MD (scratches or dirt) • MD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify the condition of the MD when the error occurs. Is the MD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material, clean) or replace the MD, and go to the next step.
2	Clear the DTC, and then insert a normal MD. Play the MD for **12 s or more**. Is DTC 07: Er07 displayed?	Yes	Replace the MD player.
		No	DTC troubleshooting completed.

DTC 07:ER08[AUDIO]

id0902f6818300

DTC 07:Er08	MD
DETECTION CONDITION	• Blank unrecorded MD is inserted.
POSSIBLE CAUSE	• Blank unrecorded MD

Diagnostic procedure

ACTION
• Insert a recorded MD into the MD player. • Inform customer that a blank MD had been inserted into the MD player.

DTC 10:ER01[AUDIO]

id0902f6833500

DTC 10:Er01	MP3 applicable CD player
DETECTION CONDITION	• CD player cannot implement insert and eject commands.
POSSIBLE CAUSE	• Defective CD (broken or foreign material stuck/attached) • MP3 applicable CD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.
		No	Repair (remove foreign material, clean) or replace the CD. and go to the next step.
2	Clear the DTC and insert a normal CD. Play the CD. Is DTC 10: Er01 displayed?	Yes	Replace the MP3 applicable CD player.
		No	DTC troubleshooting completed.

DTC 10:ER02[AUDIO]

id0902f6833600

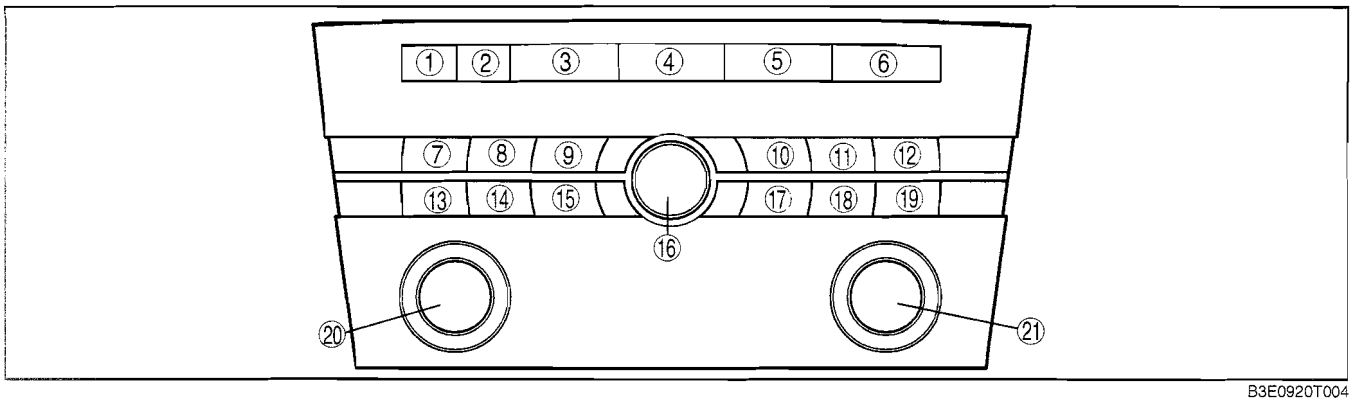
DTC 10:Er02	MP3 applicable CD player
DETECTION CONDITION	**Note** • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • MP3 applicable CD player malfunction

STEP	INSPECTION		ACTION	
1	Play the CD and change tracks. Can tracks be changed?	Yes	Go to Step 3.	
		No	Cannot change to specific tracks.	Go to the next step.
			Cannot change to any track.	Replace the CD and try to change tracks again. • If the function is normal, go to Step 3. • If the function is not normal, replace the MP3 applicable CD player.
2	Verify the condition of the CD when the error occurs. Is the CD normal?	Yes	Go to the next step.	
		No	Repair (remove foreign material, clean) or replace the CD, and go to the next step.	
3	Clear the DTC. Play the CD and change tracks. Is DTC 10: Er02 displayed?	Yes	Replace the MP3 applicable CD player.	
		No	DTC troubleshooting completed.	

DIAGNOSTIC ASSIST FUNCTION[AUDIO]

id0902f6804500

Structural View
Buttons



B3E0920T004

1	CLOCK button
2	SET button
3	FM1/2 button
4	AM button
5	CD button
6	TAPE/MD button
8	Preset button "2"
9	Preset button "3"
10	RPT button
11	SCAN button

12	SEEK UP button
13	Preset button "4"
14	Preset button "5"
15	Preset button "6"
16	POWER/VOLUME button
17	RDM button
18	PROG button
19	SEEK DOWN button
20	AUDIO CONT button
21	TUNE/TEXT/AUTO-M button

09-02D

LCD Inspection

1. With the audio power on, press the POWER button and simultaneously press the SEEK button (upper) for **approx. 1 s**.
2. Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
Start the LCD inspection mode.		The characters displayed on the LCD are not truncated or faint.	The LCD is normal.
		Except above	Replace the information display.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Button Inspection

1. With the audio power on, press the POWER button and simultaneously press the CLOCK button for **approx. 1 s**.
2. Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
• Start the button inspection mode. • Press all buttons.	—	The buzzer sounds.	The button is normal.
		The buzzer does not sound.	Replace the base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

ON-BOARD DIAGNOSTIC [AUDIO]

Speaker Inspection

1. With the audio power on, press the POWER button and simultaneously press the AUTO-M button for **approx. 1 s.**
2. Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
• Start the speaker inspection mode. • Does each speaker output sound in the following order? 1. Front passenger-side door speaker and tweeter 2. Front driver-side door speaker and tweeter 3. Driver-side rear door speaker 4. Passenger-side rear door speaker	—	Yes	Speakers, and wiring harness between the base unit and speakers are normal.
		No	• Inspect the following parts. — Malfunctioning speaker — Wiring harness between base unit and malfunctioning speaker

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Radio Reception Condition Inspection

1. With the audio power on, press the POWER button and simultaneously press the PRESET 2 button for **approx. 1 s.**
2. Inspect according to the following table:

Caution

- **Even if the system is normal, radio reception may be difficult depending on where the system is inspected (indoors/outdoors, or conditions at the location). Before inspecting the system, verify that radio reception is adequate.**
- **When inspecting, select a frequency band (radio station) with the best reception.**

INSPECTION	DISPLAY	ACTION
Start the radio reception condition inspection mode.	NORMAL CONDITION LEV-5 ↕ LEV-9	Antenna, antenna feeder and base unit are normal
	LEV-3 ↕ LEV-4	Change the frequency (radio station) and inspect again.
	MALFUNCTION PRESENT LEV-0 ↕ LEV-2	Inspect the antenna and antenna feeder. • If either the antenna or the antenna feeder is not normal, replace the malfunctioning part. • If the antenna and antenna feeder are normal, replace the base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

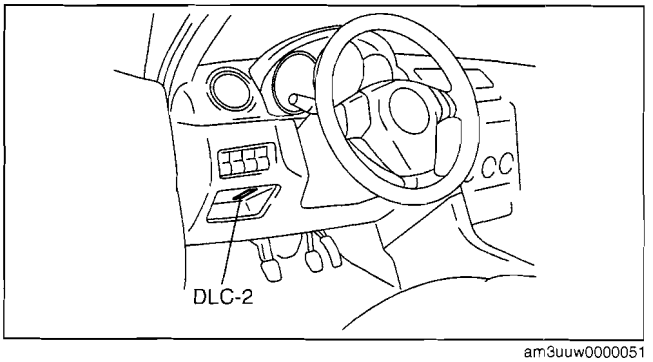
09-02E ON-BOARD DIAGNOSTIC [CONTROL SYSTEM]

DTC INSPECTION (PJB)[CONTROL SYSTEM]

1. Connect the M-MDS to the DLC-2.
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   When using the IDS (laptop PC)
   - Select the "Toolbox" tab.
   - Select "Self Test".
   - Select "Modules".
   - Select "GEM".

   When using the PDS (Pocket PC)
   - Select "Module Tests".
   - Select "GEM".
   - Select "Self Test".
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the PJB.

id0902j0902700



am3uuw0000051

DTC TABLE (PJB)[CONTROL SYSTEM]

id0902j0902800

DTC table

DTC No.	Description	Detection condition	Page
B1014	Rain sensor error*1	Rain sensor internal malfunction	(See 09-02E-5 DTC B1014[CONTROL SYSTEM].)
B1217	Alarm activation horn circuit failure	Short to GND or power supply in wiring harness between PJB and horn relay	(See 09-02E-5 DTC B1217[CONTROL SYSTEM].)
B1311	Unlock switch circuit open	Open circuit in wiring harness between PJB and driver-side door lock-link switch (unlock signal)	(See 09-02E-7 DTC B1311[CONTROL SYSTEM].)
B1317	Battery voltage high	Input voltage from the battery is excessively high	(See 09-02E-8 DTC B1317[CONTROL SYSTEM].)
B1318	Battery voltage low	Input voltage from the battery is excessively low	(See 09-02E-9 DTC B1318[CONTROL SYSTEM].)
B1320	Door ajar LF circuit open	Open circuit in wiring harness between PJB and front door latch switch (driver-side)	(See 09-02E-10 DTC B1320[CONTROL SYSTEM].)
B1328	Door ajar RF circuit open	Open circuit in wiring harness between PJB and front door latch switch (passenger-side)	(See 09-02E-12 DTC B1328[CONTROL SYSTEM].)
B1336	Door ajar RR circuit open	Open circuit in wiring harness between PJB and rear door latch switch (RH)	(See 09-02E-13 DTC B1336[CONTROL SYSTEM].)
B1342	ECU is faulted	PJB microcomputer malfunction	(See 09-02E-14 DTC B1342[CONTROL SYSTEM].)
B1345	Heated backlite input circuit short to ground	Short to GND in wiring harness between PJB and climate control unit (rear window defroster switch)	(See 09-02E-15 DTC B1345[CONTROL SYSTEM].)
B1350	Heated backlite relay short to ground	Short to GND or power supply in wiring harness between PJB and rear window defroster relay	(See 09-02E-16 DTC B1350[CONTROL SYSTEM].)
B1447	Wiper park sense circuit open	Open circuit in wiring harness between PJB and windshield wiper motor (autostop switch)	(See 09-02E-18 DTC B1447[CONTROL SYSTEM].)
B1472	Headlight on status switch input circuit short to ground	Short to GND in wiring harness between PJB and light switch (low beam)	(See 09-02E-19 DTC B1472[CONTROL SYSTEM].)
B1502	Light turn signal left circuit short to ground	Short to GND in wiring harness between PJB and turn lights	(See 09-02E-20 DTC B1502[CONTROL SYSTEM].)
B1506	Light turn signal right circuit short to ground	Short to GND in wiring harness between PJB and turn switch	(See 09-02E-22 DTC B1506[CONTROL SYSTEM].)
B1520	Hood switch circuit open	Open circuit in wiring harness between PJB and hood latch switch	(See 09-02E-23 DTC B1520[CONTROL SYSTEM].)
B1570	Headlight high beam status input circuit short to battery	Short to power supply in wiring harness between PJB and light switch (high beam)	(See 09-02E-24 DTC B1570[CONTROL SYSTEM].)
B1572	Door ajar LR circuit open	Open circuit in wiring harness between PJB and rear door latch switch (LH)	(See 09-02E-25 DTC B1572[CONTROL SYSTEM].)
B1607	Key illumination circuit short to battery	Short to power supply in wiring harness between PJB and key illumination	(See 09-02E-26 DTC B1607[CONTROL SYSTEM].)
B1614	Rear wiper interval switch input circuit short to ground	Short to GND in wiring harness between PJB and rear wiper and washer switch (INT)	(See 09-02E-27 DTC B1614[CONTROL SYSTEM].)

DTC No.	Description	Detection condition	Page
B1696	Auto light switch input circuit short to ground*1	Short to GND in wiring harness between PJB and light switch (AUTO)	(See 09-02E-29 DTC B1696[CONTROL SYSTEM].)
B1798	Position lights switch (TNS) input circuit short to ground	Short to GND in wiring harness between PJB and light switch (TNS)	(See 09-02E-30 DTC B1798[CONTROL SYSTEM].)
B1812	Backup light switch input circuit short to battery	Short to power supply in wiring harness between PJB and back-up light switch	(See 09-02E-31 DTC B1812[CONTROL SYSTEM].)
B1873	Turn signal/hazard power feed circuit short to ground	Short to GND in wiring harness between PJB and hazard warning switch	(See 09-02E-32 DTC B1873[CONTROL SYSTEM].)
B2017	DRL left output circuit failure	Open circuit or short to GND in wiring harness between PJB and headlight (low beam)	(See 09-02E-33 DTC B2017[CONTROL SYSTEM].)
B2018	DRL right output circuit failure	Open circuit or short to GND in wiring harness between PJB and headlight (low beam)	(See 09-02E-35 DTC B2018[CONTROL SYSTEM].)
B2060	Heated backlite indicator circuit failure	Short to power supply in wiring harness between PJB and climate control unit (rear window defroster indicator)	(See 09-02E-36 DTC B2060[CONTROL SYSTEM].)
B2095	Reset switch circuit failure	Short to GND in wiring harness between PJB and driver-side door key cylinder switch (unlock)	(See 09-02E-37 DTC B2095[CONTROL SYSTEM].)
B2096	Set switch circuit failure	Short to GND in wiring harness between PJB and driver-side door key cylinder switch (lock)	(See 09-02E-39 DTC B2096[CONTROL SYSTEM].)
B2114	Front washer switch input circuit short to battery	Short to power supply in wiring harness between PJB and windshield wiper and washer switch (front washer)	(See 09-02E-40 DTC B2114[CONTROL SYSTEM].)
B2175	A/C request signal circuit short to ground	Short to GND in wiring harness between PJB and climate control unit (A/C ON request)	(See 09-02E-42 DTC B2175[CONTROL SYSTEM].)
B2180	Front wiper switch (slow) circuit short to ground	Short to GND in wiring harness between PJB and windshield wiper and washer switch (low)	(See 09-02E-43 DTC B2180[CONTROL SYSTEM].)
B2181	Front wiper switch (fast) circuit short to ground	Short to GND in wiring harness between PJB and windshield wiper and washer switch (high)	(See 09-02E-44 DTC B2181[CONTROL SYSTEM].)
B2212	Panel light control circuit failure	Input voltage from the panel light control switch is excessively low or high	(See 09-02E-45 DTC B2212[CONTROL SYSTEM].)
B2218	Central locking switch circuit failure	Short to GND in wiring harness between PJB and door lock switch (driver's side and passenger's side)	(See 09-02E-47 DTC B2218[CONTROL SYSTEM].)
B2254	Front fog light switch failure	Short to GND in wiring harness between PJB and fog light switch	(See 09-02E-48 DTC B2254[CONTROL SYSTEM].)
B2259	Front wiper variable intermittent switch circuit failure	Input voltage from the windshield wiper and washer switch (INT volume or sensitivity adjustment volume) is excessively low or high	(See 09-02E-49 DTC B2259[CONTROL SYSTEM].)
B2259	Intermittent wiper circuit failure	Input voltage from the windshield wiper and washer switch (INT) is excessively low or high	(See 09-02E-49 DTC B2259[CONTROL SYSTEM].)
B2259	Intermittent wiper circuit short to ground	Short to GND in wiring harness between PJB and windshield wiper and washer switch (INT)	(See 09-02E-49 DTC B2259[CONTROL SYSTEM].)
B2477	Module configuration failure	PJB data configuration error	(See 09-02E-51 DTC B2477[CONTROL SYSTEM].)
B2479	Park brake switch circuit open	Open circuit in wiring harness between PJB and parking brake switch	(See 09-02E-51 DTC B2479[CONTROL SYSTEM].)

DTC No.	Description	Detection condition	Page
B2512	Front fog relay short to battery	Short to power supply or GND in wiring harness between PJB and front fog light relay	(See 09-02E-53 DTC B2512[CONTROL SYSTEM].)
B2555	Dome light output circuit short to battery	Open circuit or short to power supply in wiring harness between PJB and interior lights	(See 09-02E-54 DTC B2555[CONTROL SYSTEM].)
B2559	Trunk lid lock/unlock switch circuit failure	Short to GND in wiring harness between PJB and trunk lid key cylinder switch	(See 09-02E-56 DTC B2559[CONTROL SYSTEM].)
B2574	Driver door lock switch short to ground	Short to GND in wiring harness between PJB and driver-side door lock-link switch	(See 09-02E-57 DTC B2574[CONTROL SYSTEM].)
B2721	Liftgate/decklid ajar output short to ground	Short to GND in wiring harness between PJB and trunk lid latch switch	(See 09-02E-58 DTC B2721[CONTROL SYSTEM].)
B2897	Auto light relay circuit failure*1	Short to power supply in PJB internal circuit between microcomputer and headlight LO relay	(See 09-02E-59 DTC B2897[CONTROL SYSTEM].)
B2898	Right turn signal indicator output failure	• Open circuit or short to power supply or GND in wiring harness between PJB and turn light • Turn light bulb malfunction	(See 09-02E-60 DTC B2898[CONTROL SYSTEM].)
B2899	Left turn signal indicator output failure	• Open circuit or short to power supply or GND in wiring harness between PJB and turn light • Turn light bulb malfunction	(See 09-02E-62 DTC B2899[CONTROL SYSTEM].)
B2966	Front washer switch stuck	Windshield washer switch stuck ON position	(See 09-02E-64 DTC B2966[CONTROL SYSTEM].)
C1189	Brake fluid level sensor input circuit open	Open circuit in wiring harness between PJB and brake fluid level sensor	(See 09-02E-65 DTC C1189[CONTROL SYSTEM].)
U2030	Rain sensor communication fault*1	Communication error to rain sensor	(See 09-02E-67 DTC U2030[CONTROL SYSTEM].)

*1 : If equipped, for Canada only.

DTC B1014[CONTROL SYSTEM]

id0902j0830700

DTC B1014	Rain sensor error (If equipped, for Canada only.)
DETECTION CONDITION	Rain sensor internal malfunction
POSSIBLE CAUSE	• Rain sensor malfunction • PJB malfunction

Diagnostic procedure

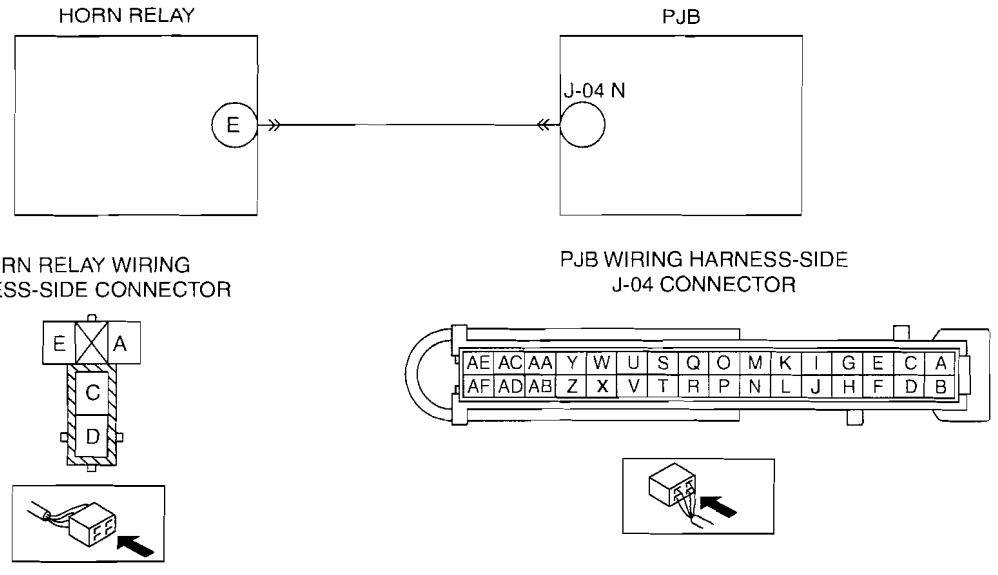
STEP	INSPECTION		ACTION
1	**INSPECT DTC** • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the rain sensor, then go to the next step. (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1217[CONTROL SYSTEM]

id0902j0902100

09-02E

DTC B1217	Alarm activation horn circuit failure
DETECTION CONDITION	Short to GND or power supply in wiring harness between PJB and horn relay
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-04 N and horn relay terminal E • Short to GND in wiring harness between PJB terminal J-04 N and horn relay terminal E • Short to power supply in wiring harness between PJB terminal J-04 N and horn relay terminal E • Horn relay malfunction • PJB malfunction



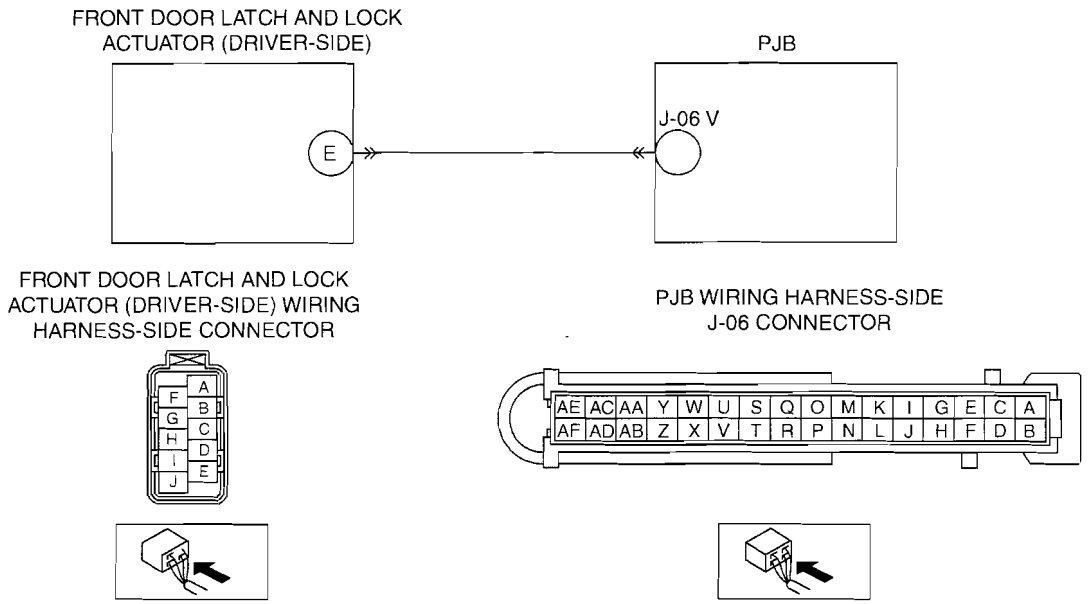
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT HORN RELAY CONNECTOR** • Turn the ignition switch off. • Disconnect the horn relay connector. • Inspect the horn relay connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT HORN RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-04 N (wiring harness-side) and horn relay terminal E (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
4	**INSPECT HORN RELAY CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 N (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT HORN RELAY CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-04 N (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT HORN RELAY** • Inspect the horn relay. (See 09-21-3 RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the horn relay, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1311[CONTROL SYSTEM]

id0902j0830800

DTC B1311	Unlock switch circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and driver-side door lock-link switch (unlock signal)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 V and front door latch and lock actuator (driver-side) terminal E • Front door latch and lock actuator malfunction • PJB malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) CONNECTOR** • Turn the ignition switch off. • Disconnect the front door latch and lock actuator (driver-side) connector. • Inspect the front door latch and lock actuator (driver-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 V (wiring harness-side) and front door latch and lock actuator (driver-side) terminal E (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE)** • Inspect the front door latch and lock actuator (driver-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (driver-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1317[CONTROL SYSTEM]

id0902j0830900

DTC B1317	Battery voltage high
DETECTION CONDITION	Input voltage from the battery is excessively high
POSSIBLE CAUSE	• Battery malfunction • Generator malfunction • PJB malfunction

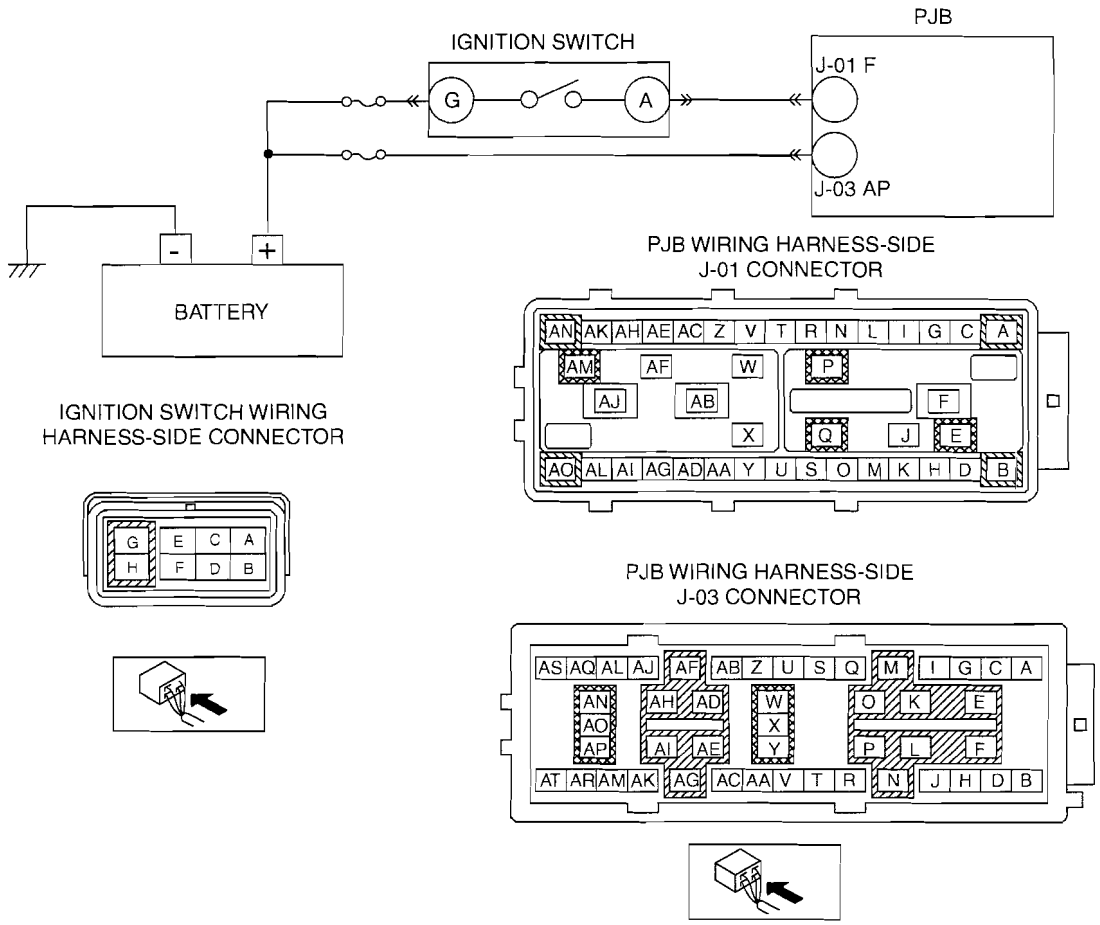
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DTC FROM PCM** • Connect the M-MDS to the DLC-2. • Are any DTCs from the PCM displayed?	Yes	Perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].) Go to the next step.
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Turn the ignition switch to LOCK position then ON position. • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1318[CONTROL SYSTEM]

id0902j0831000

DTC B1318	Battery voltage low
DETECTION CONDITION	Input voltage from the battery is excessively low
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 F and battery • Open circuit in wiring harness between PJB terminal J-03 AP and battery • Short to GND in wiring harness between PJB terminal J-01 F and battery • Short to GND in wiring harness between PJB terminal J-03 AP and battery • Battery malfunction • Generator malfunction • PJB malfunction



09-02E

Diagnostic procedure

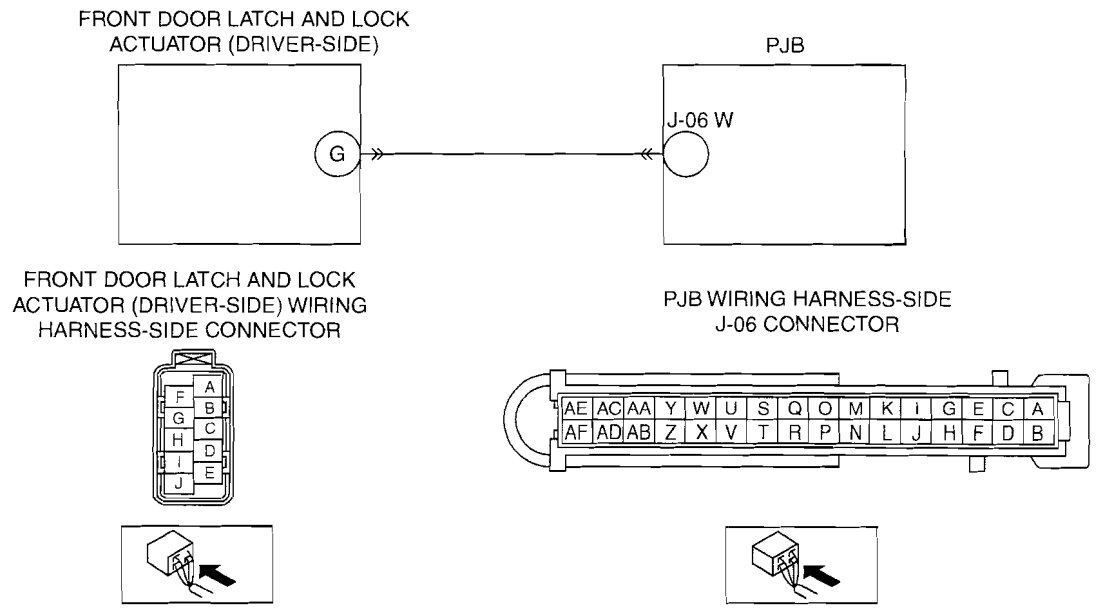
STEP	INSPECTION		ACTION
1	**INSPECT DTC FROM PCM** • Connect the M-MDS to the DLC-2. • Are any DTCs from the PCM displayed?	Yes	Perform DTC inspection. (See 01-02A-22 DTC TABLE[LF, L3].) Go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT PJB POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Disconnect the negative battery cable. • Disconnect the positive battery cable. • Inspect for continuity between following terminals: — PJB terminal J-01 F (wiring harness-side) — battery positive terminal (wiring harness-side) — PJB terminal J-03 AP (wiring harness-side) — battery positive terminal (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT PJB POWER SUPPLY CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-01 F (wiring harness-side) — body GND — PJB terminal J-03 AP (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Turn the ignition switch to LOCK position then ON position. • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1320[CONTROL SYSTEM]

id0902j0831100

DTC B1320	Door ajar LF circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and front door latch switch (driver-side)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 W and front door latch and lock actuator (driver-side) terminal G • Front door latch and lock actuator malfunction • PJB malfunction



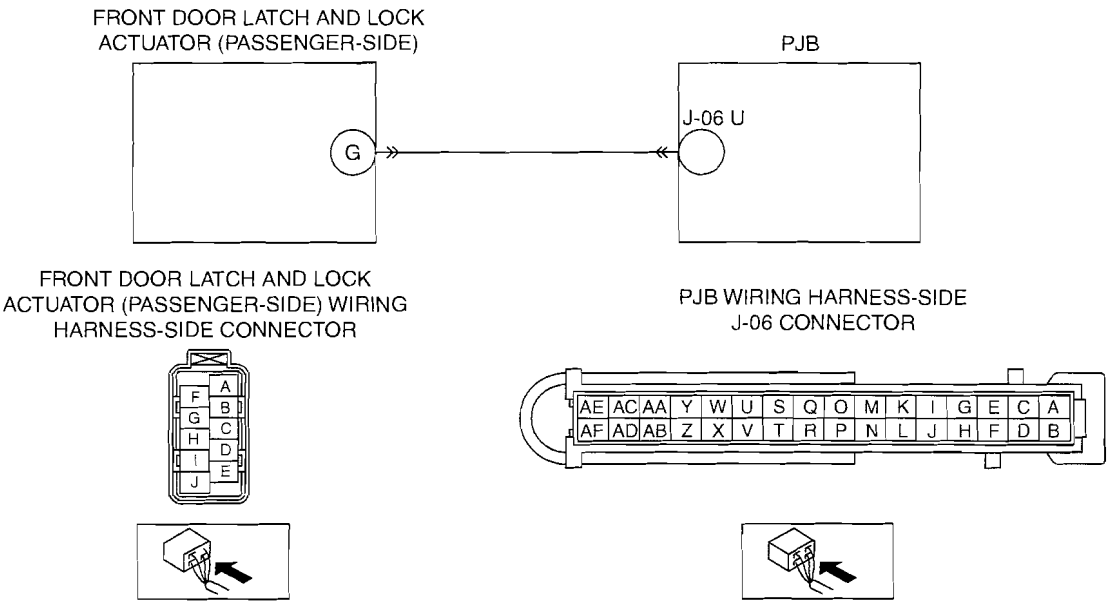
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) CONNECTOR** • Turn the ignition switch off. • Disconnect the front door latch and lock actuator (driver-side) connector. • Inspect the front door latch and lock actuator (driver-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 W (wiring harness-side) and front door latch and lock actuator (driver-side) terminal G (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE)** • Inspect the front door latch and lock actuator (driver-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (driver-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1328[CONTROL SYSTEM]

id0902j0831200

DTC B1328	Door ajar RF circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and front door latch switch (passenger-side)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 U and front door latch and lock actuator (passenger-side) terminal G • Front door latch and lock actuator malfunction • PJB malfunction



Diagnostic procedure

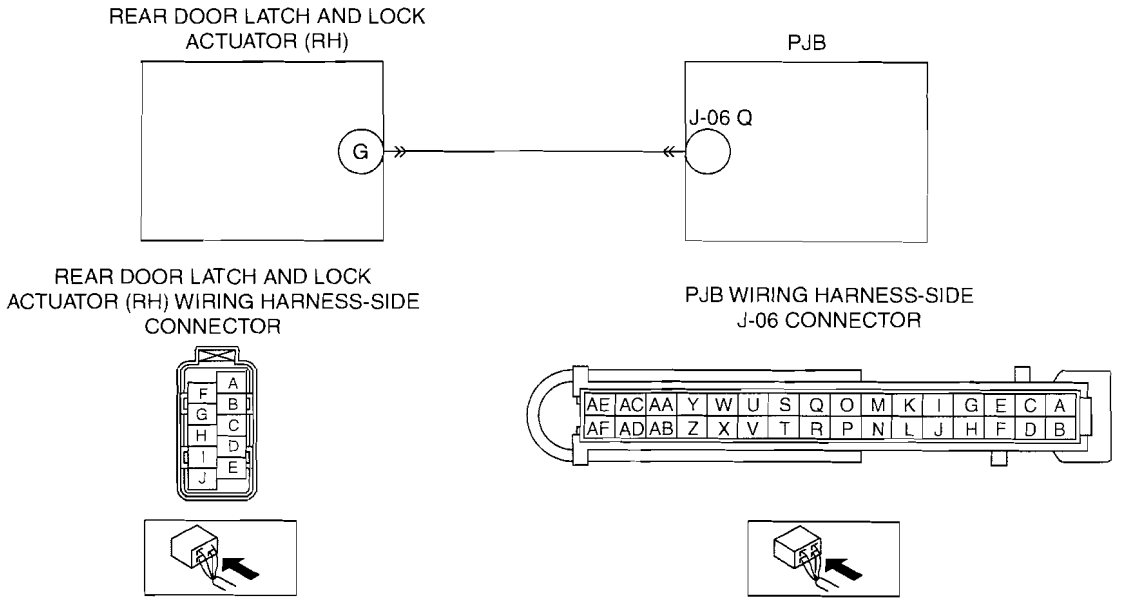
STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (PASSENGER-SIDE) CONNECTOR** • Turn the ignition switch off. • Disconnect the front door latch and lock actuator (passenger-side) connector. • Inspect the front door latch and lock actuator (passenger-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (PASSENGER-SIDE) SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 U (wiring harness-side) and front door latch and lock actuator (passenger-side) terminal G (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.

STEP	INSPECTION		ACTION
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (PASSENGER-SIDE)** • Inspect the front door latch and lock actuator (passenger-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (passenger-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1336[CONTROL SYSTEM]

id0902j0834000

DTC B1336	Door ajar RR circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and rear door latch switch (RH)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 Q and rear door latch and lock actuator (RH) terminal G • Rear door latch and lock actuator malfunction • PJB malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (RH) CONNECTOR** • Turn the ignition switch off. • Disconnect the rear door latch and lock actuator (RH) connector. • Inspect the rear door latch and lock actuator (RH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (RH) SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 Q (wiring harness-side) and rear door latch and lock actuator (RH) terminal G (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (RIGHT REAR)** • Inspect the rear door latch and lock actuator (RH). (See 09-14-6 REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the rear door latch and lock actuator (RH), then go to the next step. (See 09-14-5 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1342[CONTROL SYSTEM]

id0902j0801600

DTC B1342	ECU is faulted
DETECTION CONDITION	PJB microcomputer malfunction
POSSIBLE CAUSE	• PJB microcomputer malfunction

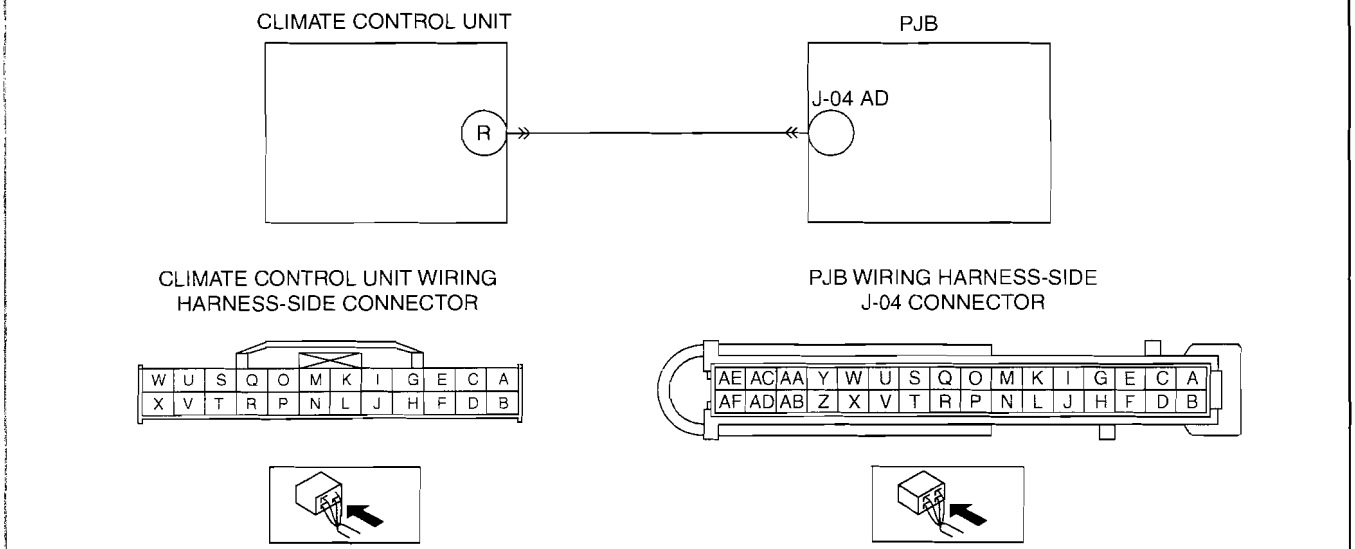
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DTC** • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1345[CONTROL SYSTEM]

id0902j0831300

DTC B1345	Heated backlite input circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and climate control unit (rear window defroster switch)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 AD and climate control unit terminal R • Climate control unit malfunction • PJB malfunction



09-02E

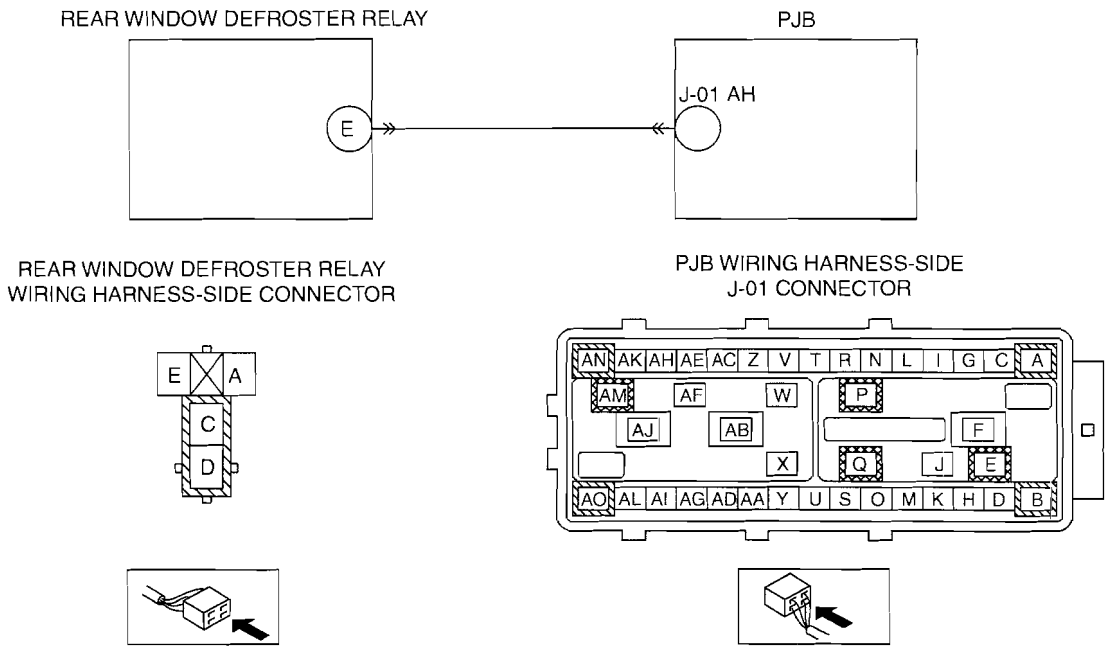
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CLIMATE CONTROL UNIT CONNECTOR** • Disconnect the climate control unit connector. • Inspect the climate control unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT REAR WINDOW DEFROSTER SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 AD (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect the climate control unit. (See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].) • Is there any malfunction?	Yes	Replace the climate control unit, then go to the next step. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER], 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1350[CONTROL SYSTEM]

id0902j0834100

DTC B1350	Heated backlite relay short to ground
DETECTION CONDITION	Short to GND or power supply in wiring harness between PJB and rear window defroster relay
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AH and rear window defroster relay terminal E • Short to GND in wiring harness between PJB terminal J-01 AH and rear window defroster relay terminal E • Short to power supply in wiring harness between PJB terminal J-01 AH and rear window defroster relay terminal E • Rear window defroster relay malfunction • PJB malfunction



Diagnostic procedure

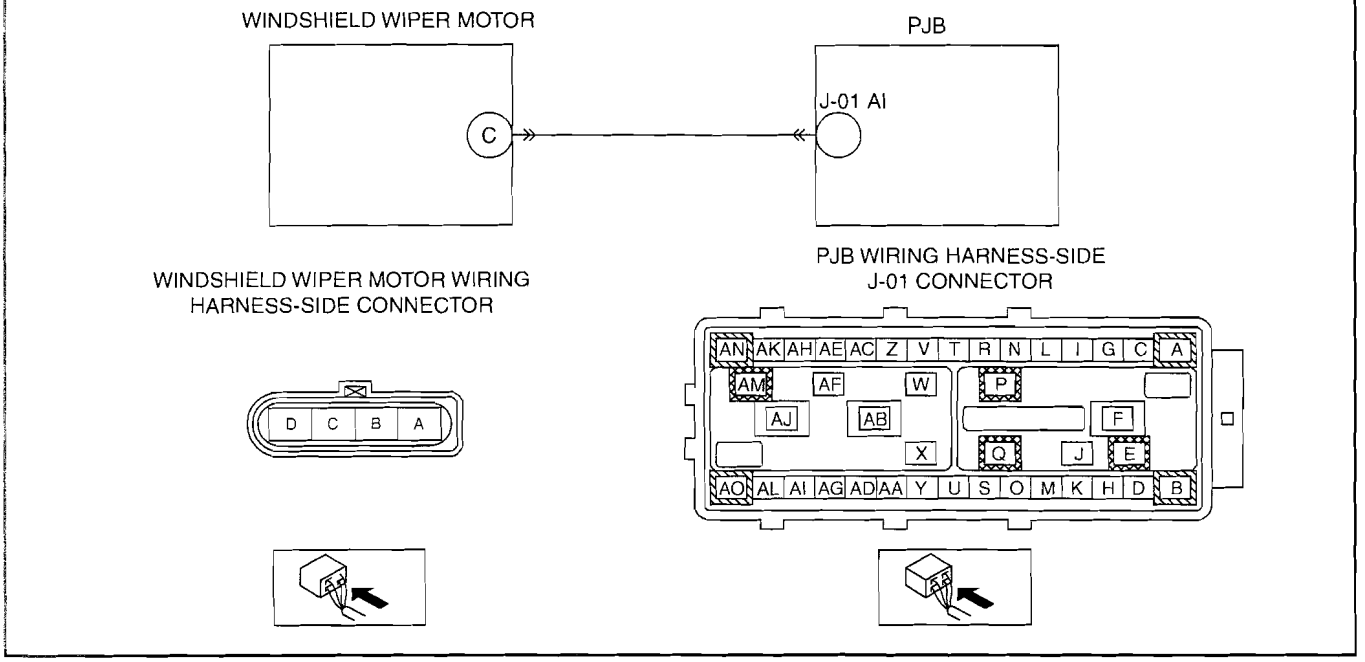
STEP	INSPECTION		ACTION
1	**INSPECT REAR WINDOW DEFROSTER RELAY CONNECTOR** • Turn the ignition switch off. • Disconnect the rear window defroster relay connector. • Inspect the rear window defroster relay connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT REAR WINDOW DEFROSTER RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-01 AH (wiring harness-side) and rear window defroster relay terminal E (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.

STEP	INSPECTION		ACTION
4	**INSPECT REAR WINDOW DEFROSTER RELAY CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-01 AH (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT REAR WINDOW DEFROSTER RELAY CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-01 AH (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT REAR WINDOW DEFROSTER RELAY** • Inspect the rear window defroster relay. (See 09-21-3 RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the rear window defroster relay, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1447[CONTROL SYSTEM]

id0902j0831400

DTC B1447	Wiper park sense circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and windshield wiper motor (autostop switch)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AI and windshield wiper motor terminal C • Windshield wiper motor malfunction • PJB malfunction



Diagnostic procedure

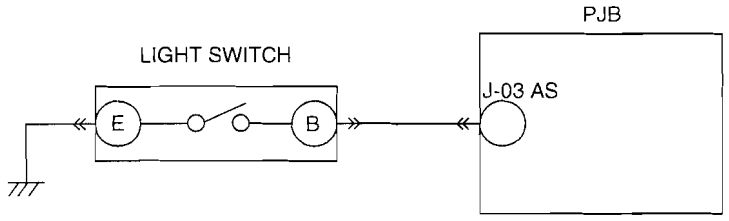
STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER MOTOR CONNECTOR** • Turn the ignition switch off. • Disconnect the windshield wiper motor connector. • Inspect the windshield wiper motor connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER MOTOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-01 AI (wiring harness-side) and windshield wiper motor terminal C (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT WINDSHIELD WIPER MOTOR** • Inspect the windshield wiper motor. (See 09-19-7 WINDSHIELD WIPER MOTOR INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper motor, then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

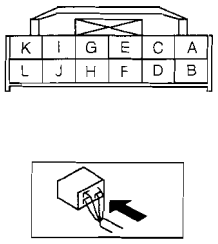
DTC B1472[CONTROL SYSTEM]

id0902j0831500

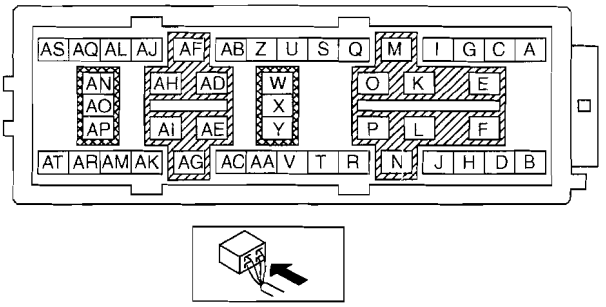
DTC B1472	**Headlight on status switch input circuit short to ground**
DETECTION CONDITION	Short to GND in wiring harness between PJB and light switch (low beam)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-03 AS and light switch terminal B • Light switch malfunction • PJB malfunction



LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-03 CONNECTOR



Diagnostic procedure

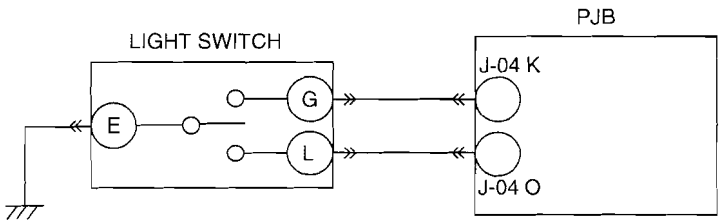
STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-03 AS (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

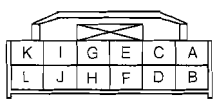
DTC B1502[CONTROL SYSTEM]

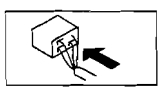
id0902j0834200

DTC B1502	**Light turn signal left circuit short to ground**
DETECTION CONDITION	Short to GND in wiring harness between PJB and turn switch (LH)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 O and light switch terminal L • Light switch malfunction • PJB malfunction

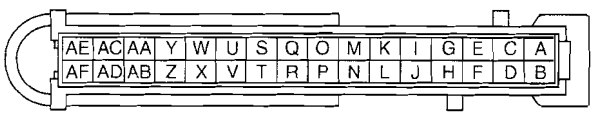


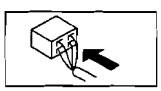
LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-04 CONNECTOR





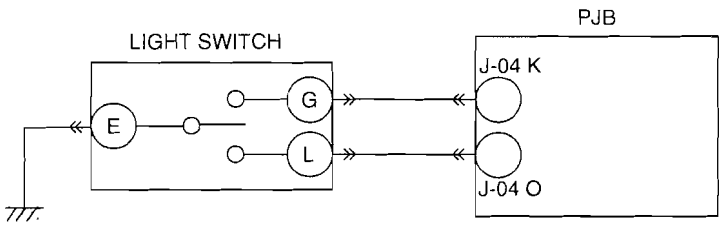
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-04 O (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. • Is there any malfunction?	Yes	Replace the light switch, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

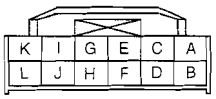
DTC B1506[CONTROL SYSTEM]

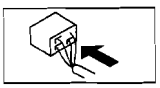
id0902j0831600

DTC B1506	Light turn signal right circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and turn switch (RH)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 K and light switch terminal G • Light switch malfunction • PJB malfunction

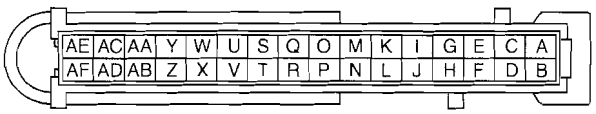


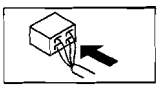
LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-04 CONNECTOR





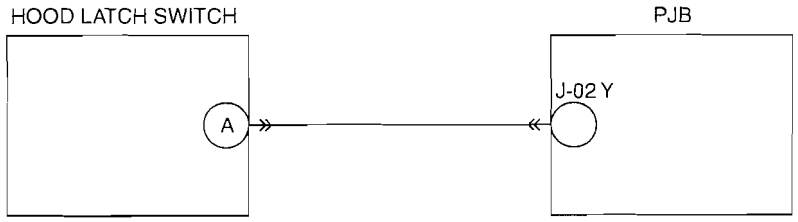
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-04 K (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH INSPECTION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

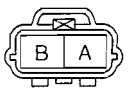
DTC B1520[CONTROL SYSTEM]

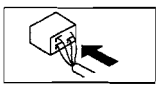
id0902j0834300

DTC B1520	Hood switch circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and hood latch switch
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-02 Y and hood latch switch terminal A • Hood latch switch malfunction • PJB malfunction

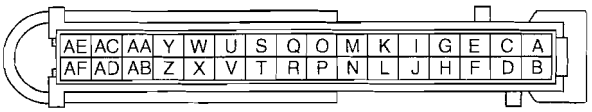


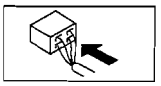
HOOD LATCH SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-02 CONNECTOR





09-02E

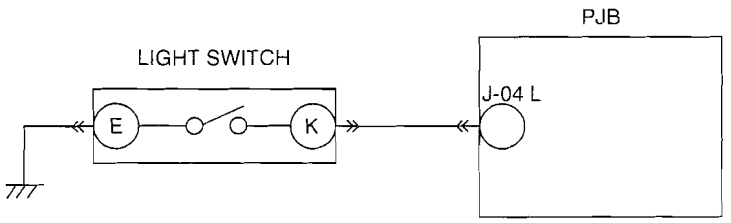
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT HOOD LATCH SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the hood latch switch connector. • Inspect the hood latch switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT HOOD LATCH SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-02 Y (wiring harness-side) and hood latch switch terminal A (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT HOOD LATCH SWITCH** • Inspect the hood latch switch. (See 09-14-23 HOOD LATCH SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the hood latch switch, then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

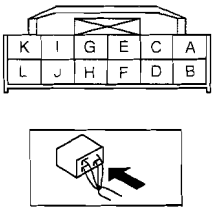
DTC B1570[CONTROL SYSTEM]

id0902j0831700

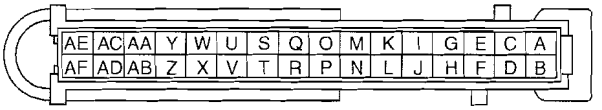
DTC B1570	Headlight high beam status input circuit short to battery
DETECTION CONDITION	Short to power supply in wiring harness between PJB and light switch (high beam)
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-04 L and light switch terminal K • Light switch malfunction • PJB malfunction



LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-04 CONNECTOR



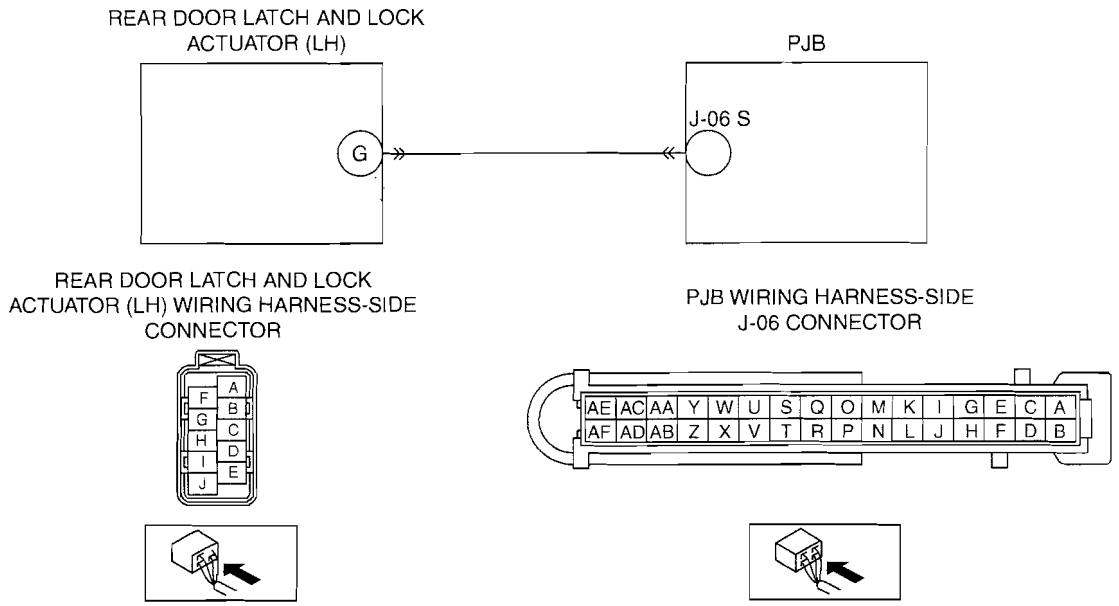
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-04 L (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1572[CONTROL SYSTEM]

id0902j0831800

DTC B1572	Door ajar LR circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and rear door latch switch (LH)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 S and rear door latch and lock actuator (LH) terminal G • Rear door latch and lock actuator malfunction • PJB malfunction



09-02E

Diagnostic procedure

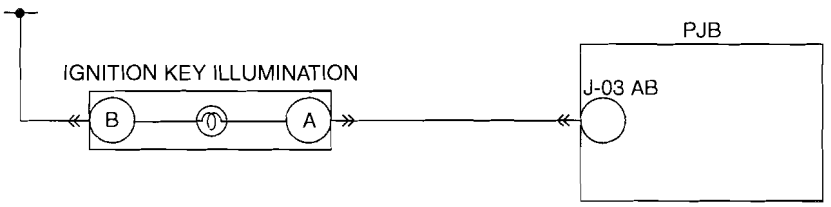
STEP	INSPECTION		ACTION
1	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (LH) CONNECTOR** • Turn the ignition switch off. • Disconnect the rear door latch and lock actuator (LH) connector. • Inspect the rear door latch and lock actuator (LH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (LH) SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 S (wiring harness-side) and rear door latch and lock actuator (LH) terminal G (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT REAR DOOR LATCH AND LOCK ACTUATOR (LH)** • Inspect the rear door latch and lock actuator (LH). (See 09-14-6 REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the rear door latch and lock actuator (LH), then go to the next step. (See 09-14-5 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

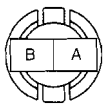
DTC B1607[CONTROL SYSTEM]

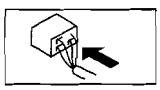
id0902j0834600

DTC B1607	Key illumination circuit short to battery
DETECTION CONDITION	Short to power supply in wiring harness between PJB and key illumination
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-03 AB and key illumination terminal A • Ignition key illumination malfunction • PJB malfunction

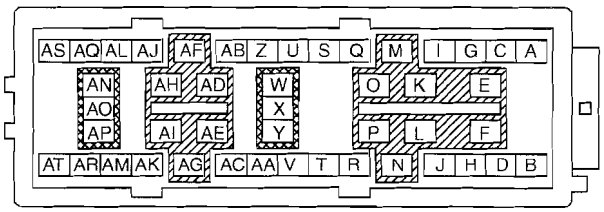


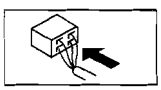
IGNITION KEY ILLUMINATION WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-03 CONNECTOR





Diagnostic procedure

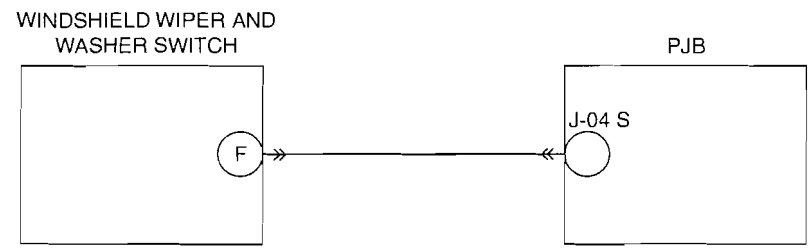
STEP	INSPECTION		ACTION
1	**INSPECT KEY ILLUMINATION CONNECTOR** • Turn the ignition switch off. • Disconnect the key illumination connector. • Inspect the key illumination connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**INSPECT KEY ILLUMINATION SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-03 AB (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT KEY ILLUMINATION** • Inspect the key illumination. • Is there any malfunction?	Yes	Replace the key illumination, then go to the next step. (See 09-18-26 IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

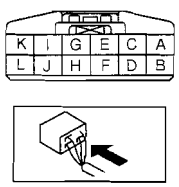
DTC B1614[CONTROL SYSTEM]

id0902j0831900

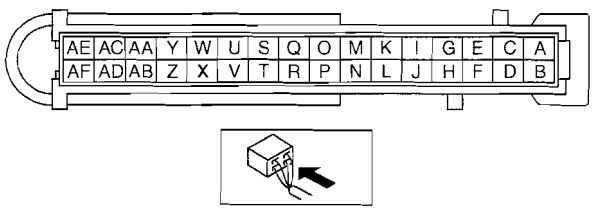
DTC B1614	**Rear wiper interval switch input circuit short to ground**
DETECTION CONDITION	Short to GND in wiring harness between PJB and rear wiper and washer switch (INT)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 S and windshield wiper and washer switch terminal F • Windshield wiper and washer switch malfunction • PJB malfunction



WINDSHIELD WIPER AND WASHER SWITCH WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-04 CONNECTOR



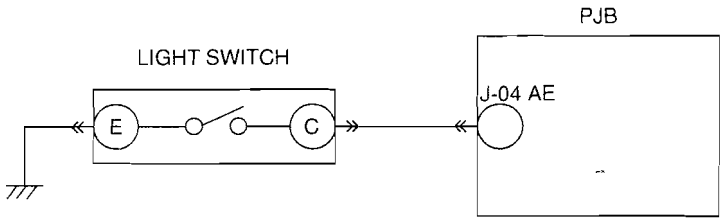
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 S (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

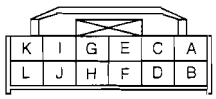
DTC B1696[CONTROL SYSTEM]

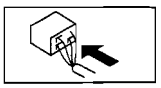
id0902j0832000

DTC B1696	Auto light switch input circuit short to ground (If equipped, for Canada only.)
DETECTION CONDITION	Short to GND in wiring harness between PJB and light switch (AUTO)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 AE and light switch terminal C • Light switch malfunction • PJB malfunction

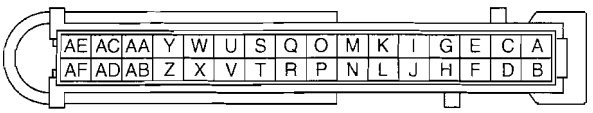


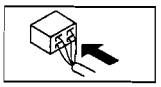
LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-04 CONNECTOR





09-02E

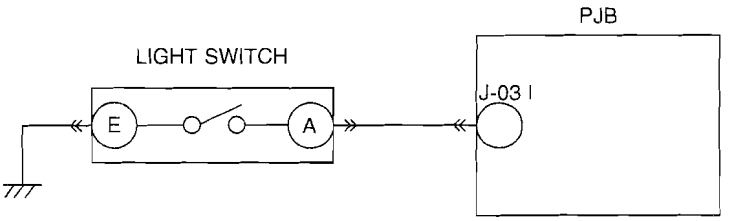
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 AE (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

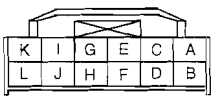
DTC B1798[CONTROL SYSTEM]

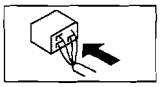
id0902j0832100

DTC B1798	Position lights switch (TNS) input circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and light switch (TNS)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-03 I and light switch terminal A • Light switch malfunction • PJB malfunction

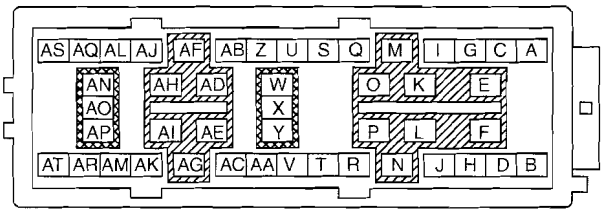


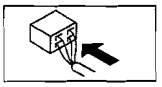
LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-03 CONNECTOR





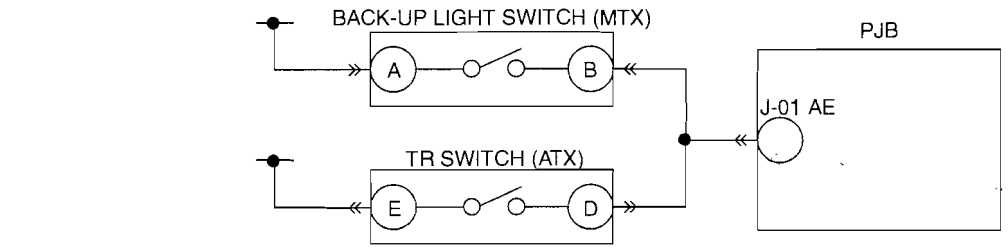
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-03 I (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

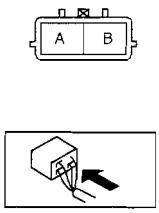
DTC B1812[CONTROL SYSTEM]

id0902j0834700

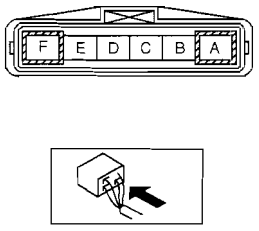
DTC B1812	Backup light switch input circuit short to battery
DETECTION CONDITION	Short to power supply in wiring harness between PJB and back-up light switch
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-01 AE and back-up light switch terminal B (MTX) • Short to power supply in wiring harness between PJB terminal J-01 AE and TR switch terminal D (ATX) • Back-up light switch malfunction (MTX) • TR switch malfunction (ATX) • PJB malfunction



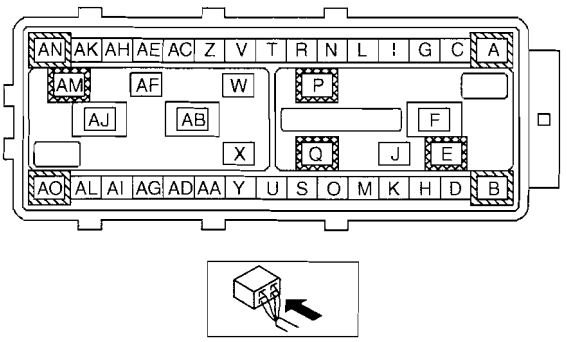
BACK-UP LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR



TR SWITCH WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-01 CONNECTOR



Diagnostic procedure

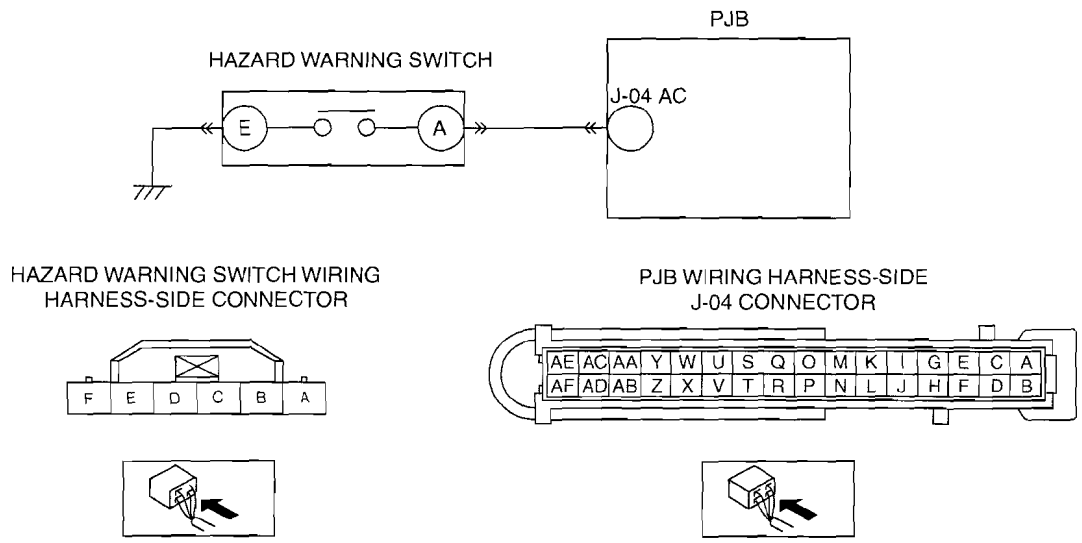
STEP	INSPECTION		ACTION
1	**INSPECT BACK-UP LIGHT SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the back-up light switch connector. (MTX) • Disconnect the TR switch connector. (ATX) • Inspect the switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT BACK-UP LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-01 AE (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT BACK-UP LIGHT SWITCH** • Inspect the back-up light switch. (MTX) (See 09-18-18 BACK-UP LIGHT SWITCH INSPECTION.) • Inspect the TR switch. (ATX) (See 05-17A-10 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FN4A-EL].) (See 05-17B-11 TRANSAXLE RANGE (TR) SWITCH INSPECTION[FS5A-EL].) • Is there any malfunction?	Yes	Replace the back-up light switch (MTX) or TR switch (ATX), then go to the next step. (See 09-18-18 BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION.) (See 05-17A-12 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FN4A-EL].) (See 05-17B-14 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION[FS5A-EL].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B1873[CONTROL SYSTEM]

id0902j0832200

DTC B1873	Turn signal/hazard power feed circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and hazard warning switch
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 AC and hazard warning switch terminal A • Hazard warning switch malfunction • PJB malfunction



Diagnostic procedure

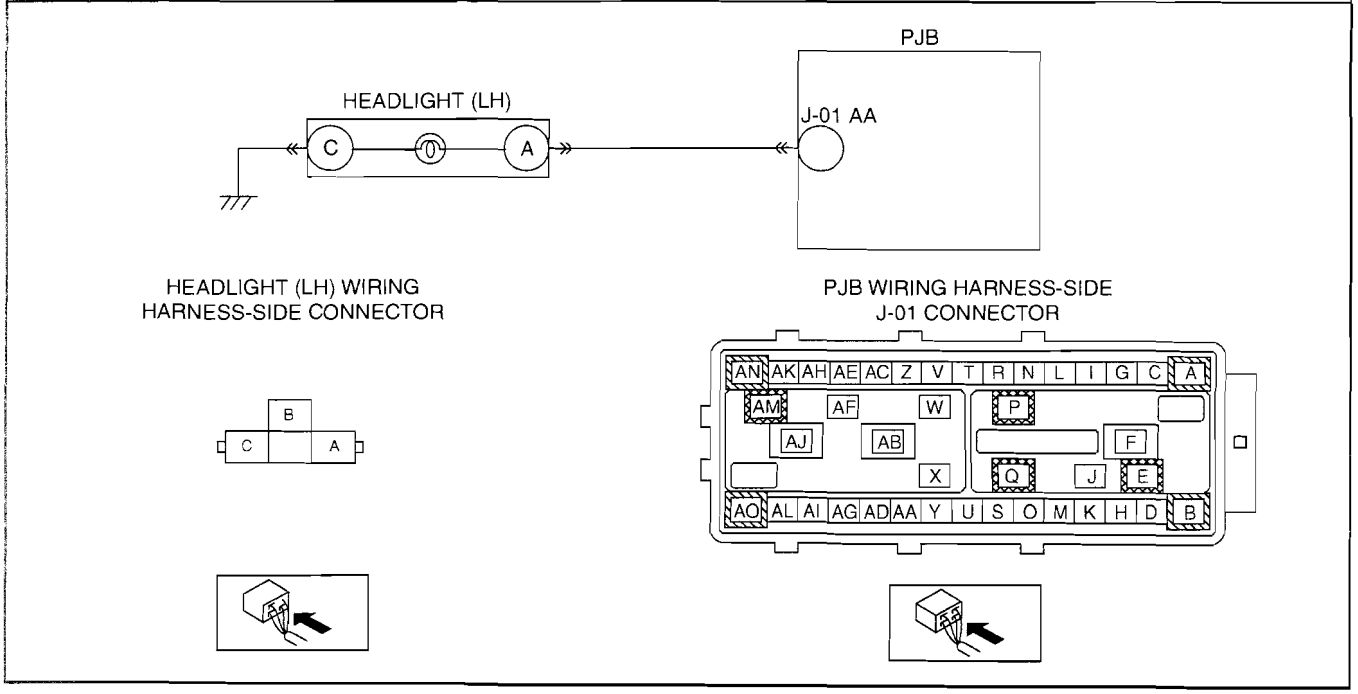
STEP	INSPECTION		ACTION
1	**INSPECT HAZARD WARNING SWITCH CONNECTOR** • Disconnect the hazard warning switch connector. • Inspect the hazard warning switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT HAZARD WARNING SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 AC (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT HAZARD WARNING SWITCH** • Inspect the hazard warning switch. (See 09-18-21 HAZARD WARNING SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the hazard warning switch, then go to the next step. (See 09-18-21 HAZARD WARNING SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2017[CONTROL SYSTEM]

id0902j0902200

DTC B2017	DRL left output circuit failure
DETECTION CONDITION	Open circuit or short to GND in wiring harness between PJB and headlight (low beam)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AA and headlight (LH) terminal A • Short to power supply in wiring harness between PJB terminal J-01 AA and headlight (LH) terminal A • Short to GND in wiring harness between PJB terminal J-01 AA and headlight (LH) terminal A • Headlight malfunction • PJB malfunction



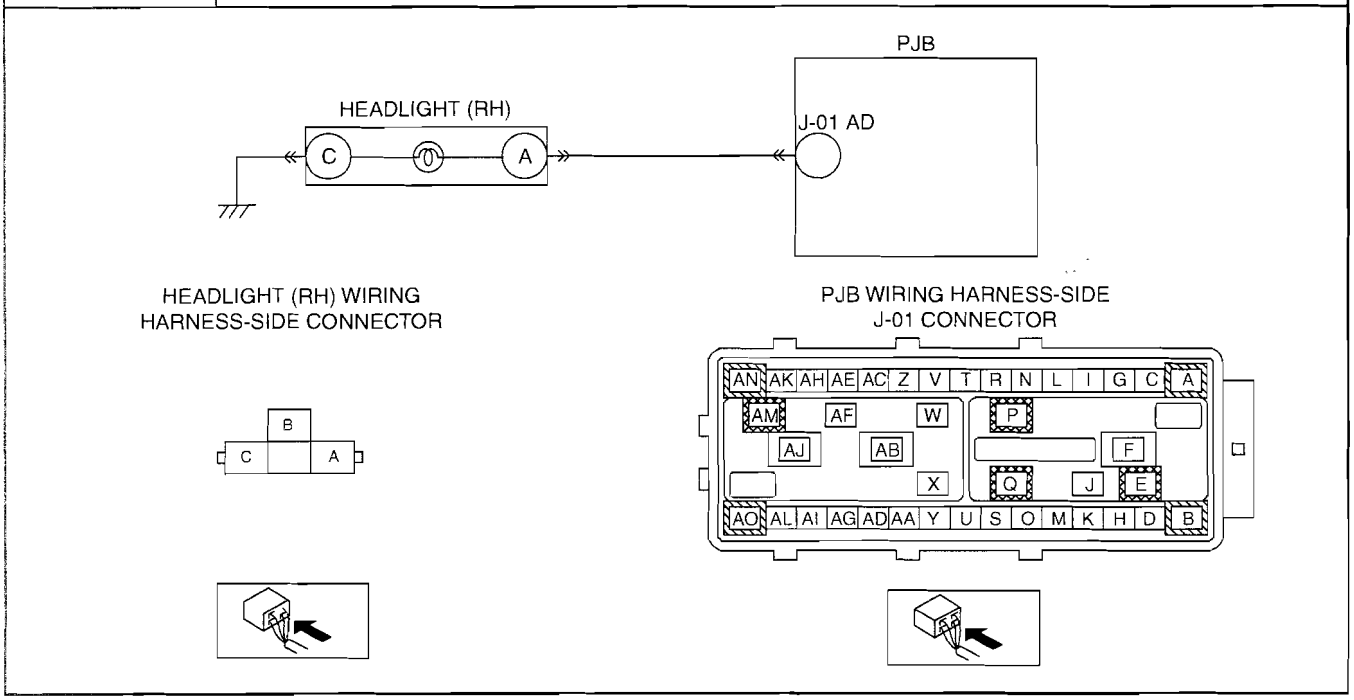
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT HEADLIGHT CONNECTOR** • Turn the ignition switch off. • Disconnect the headlight (LH) connectors. • Inspect the headlight (LH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following terminals: — PJB terminal J-01 AA (wiring harness-side) — headlight (LH) terminal A (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 7.
4	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-01 AA (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between following terminals: — PJB terminal J-01 AA (wiring harness-side) — body GND • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT HEADLIGHT** • Inspect all the headlight. • Is there any malfunction?	Yes	Replace the headlight, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2018[CONTROL SYSTEM]

id0902j0902300

DTC B2018	DRL right output circuit failure
DETECTION CONDITION	Open circuit or short to GND in wiring harness between PJB and headlight (low beam)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AD and headlight (RH) terminal A • Short to power supply in wiring harness between PJB terminal J-01 AD and headlight (RH) terminal A • Short to GND in wiring harness between PJB terminal J-01 AD and headlight (RH) terminal A • Headlight malfunction • PJB malfunction



Diagnostic procedure

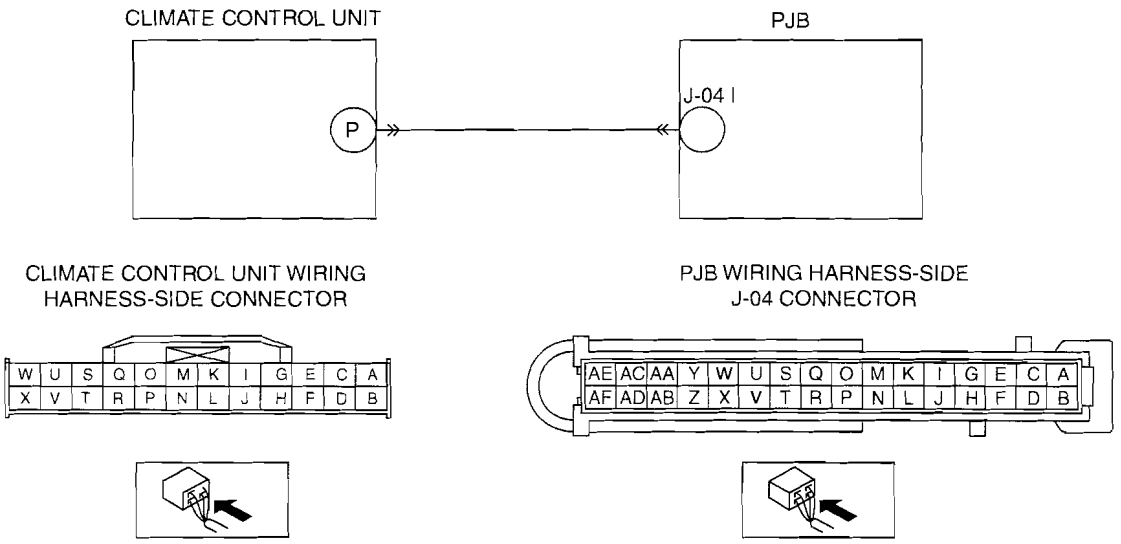
STEP	INSPECTION		ACTION
1	**INSPECT HEADLIGHT CONNECTOR** • Turn the ignition switch off. • Disconnect the headlight (RH) connectors. • Inspect the headlight (RH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following terminals: — PJB terminal J-01 AD (wiring harness-side) — headlight (RH) terminal A (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 7.
4	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-01 AD (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT HEADLIGHT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between following terminals: — PJB terminal J-01 AD (wiring harness-side) — body GND • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT HEADLIGHT** • Inspect all the headlight. • Is there any malfunction?	Yes	Replace the headlight, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2060[CONTROL SYSTEM]

id0902j0834900

DTC B2060	Heated backlite indicator circuit failure
DETECTION CONDITION	Short to power supply in wiring harness between PJB and climate control unit (rear window defroster indicator)
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-04 I and climate control unit terminal P • Climate control unit malfunction • PJB malfunction



Diagnostic procedure

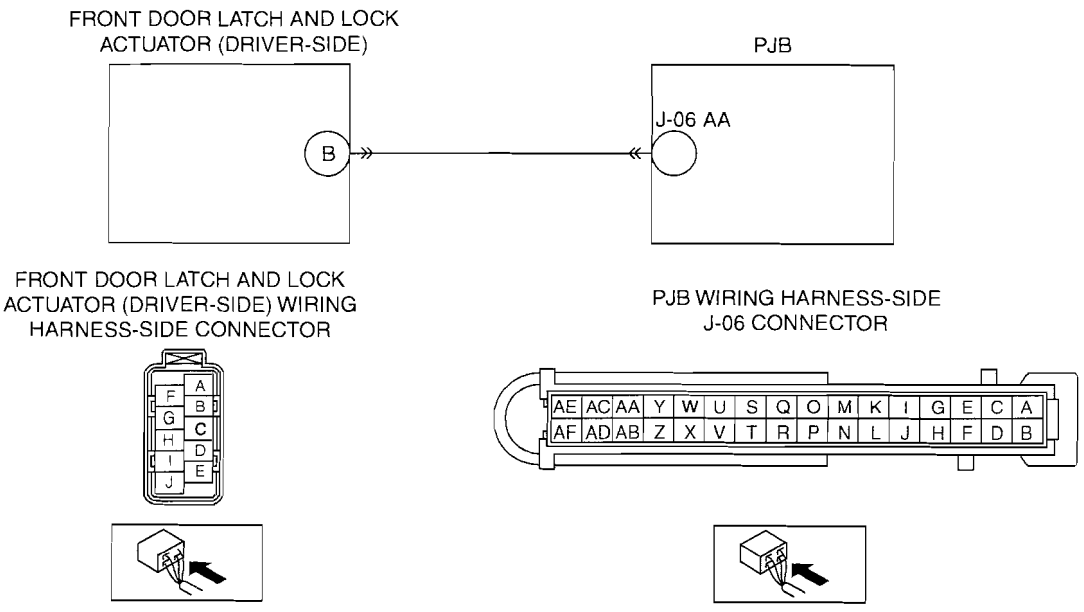
STEP	INSPECTION		ACTION
1	**INSPECT CLIMATE CONTROL UNIT CONNECTOR** • Turn the ignition switch off. • Disconnect the climate control unit connector. • Inspect the climate control unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT CLIMATE CONTROL UNIT SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-04 I (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect the climate control unit. (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is there any malfunction?	Yes	Replace the climate control unit, then go to the next step. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER], 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2095[CONTROL SYSTEM]

id0902j0835000

DTC B2095	Reset switch circuit failure
DETECTION CONDITION	Short to GND in wiring harness between PJB and driver-side door key cylinder switch (unlock)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 AA and front door latch and lock actuator (driver-side) terminal B • Front door latch and lock actuator (driver-side) malfunction • PJB malfunction



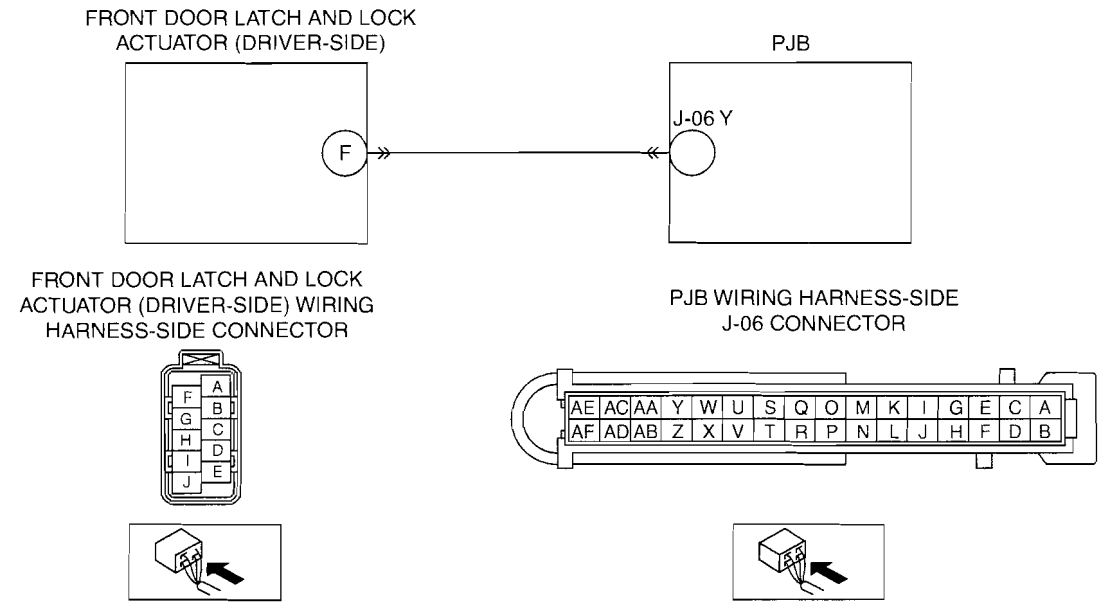
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) CONNECTOR** • Disconnect the front door latch and lock actuator (driver-side) connector. • Inspect the front door latch and lock actuator (driver-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 AA (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE)** • Inspect the front door latch and lock actuator (driver-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (driver-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETE** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2096[CONTROL SYSTEM]

id0902j0835100

DTC B2096	Set switch circuit failure
DETECTION CONDITION	Short to GND in wiring harness between PJB and driver-side door key cylinder switch (lock)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 Y and front door latch and lock actuator (driver-side) terminal F • Front door latch and lock actuator (driver-side) malfunction • PJB malfunction



Diagnostic procedure

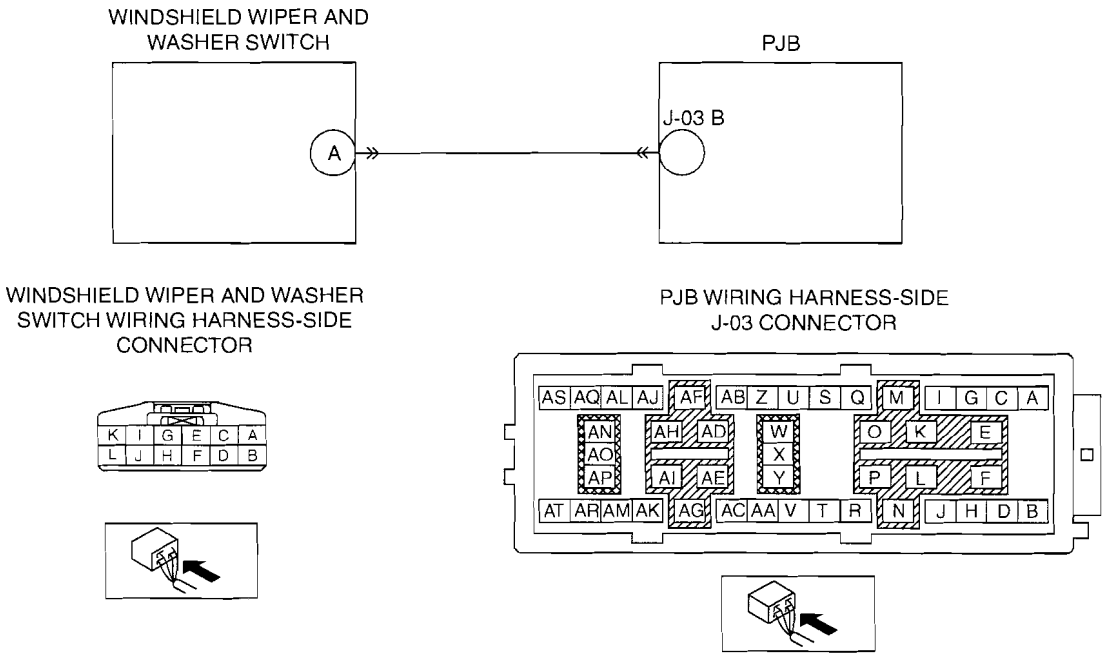
STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) CONNECTOR** • Disconnect the front door latch and lock actuator (driver-side) connector. • Inspect the front door latch and lock actuator (driver-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 Y (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE)** • Inspect the front door latch and lock actuator (driver-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (driver-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2114[CONTROL SYSTEM]

id0902j0832300

DTC B2114	Front washer switch input circuit short to battery
DETECTION CONDITION	Short to power supply in wiring harness between PJB and windshield wiper and washer switch (front washer)
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-03 B and windshield wiper and washer switch terminal A • Windshield wiper and washer switch malfunction • PJB malfunction



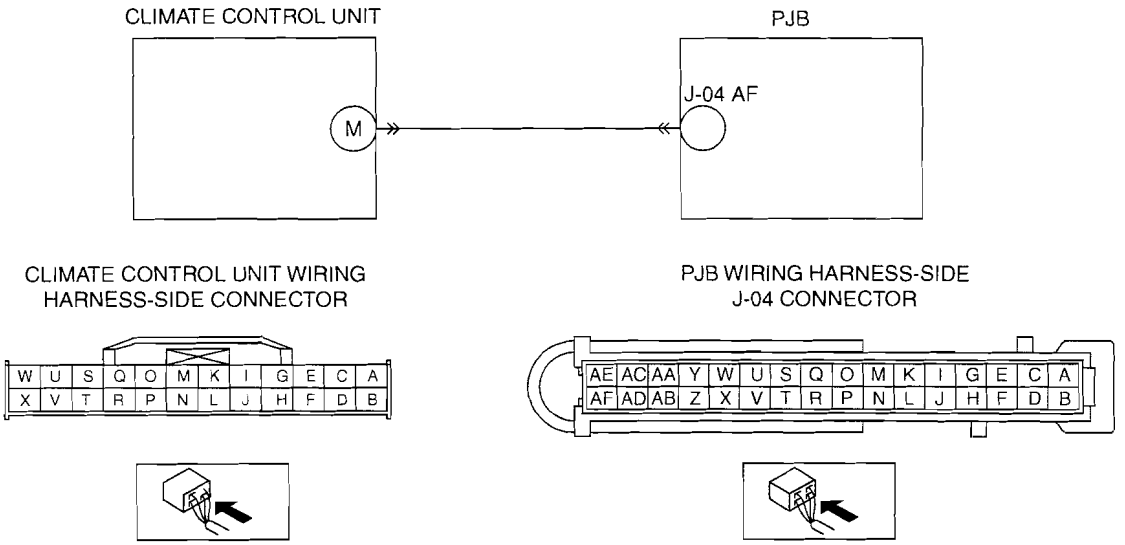
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-03 B (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2175[CONTROL SYSTEM]

id0902j0832400

DTC B2175	A/C request signal circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and climate control unit (A/C ON request)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 AF and climate control unit terminal M • Climate control unit malfunction • PJB malfunction



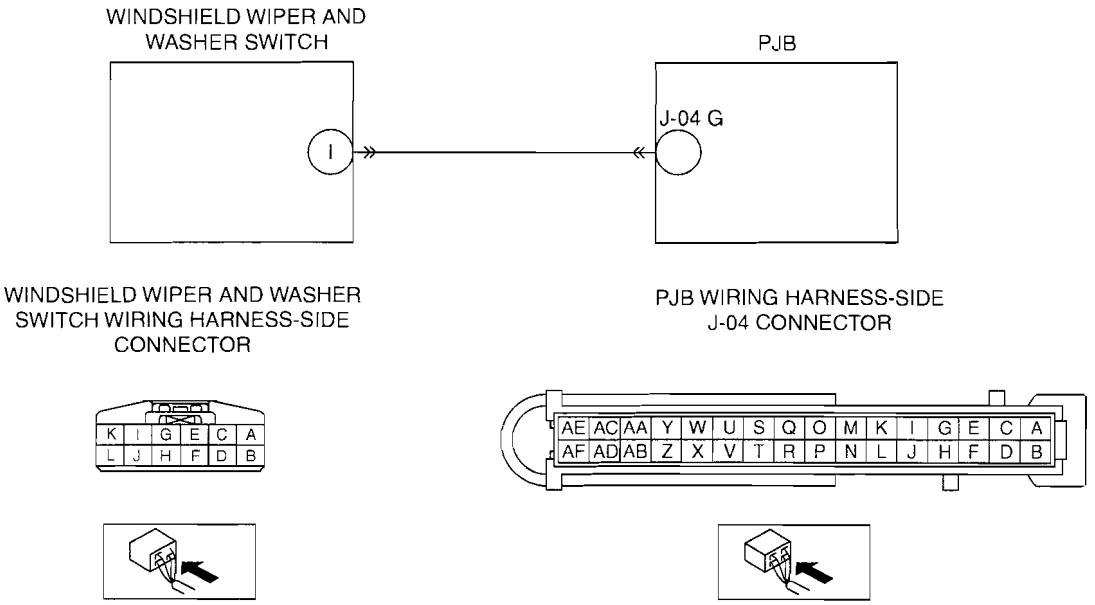
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT CLIMATE CONTROL UNIT CONNECTOR** • Disconnect the climate control unit connector. • Inspect the climate control unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT CLIMATE CONTROL UNIT SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 AF (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect the climate control unit. (See 07-40-38 CLIMATE CONTROL UNIT INSPECTION[MANUAL AIR CONDITIONER].) • Is there any malfunction?	Yes	Replace the climate control unit, then go to the next step. (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER], 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2180[CONTROL SYSTEM]

id0902j0832600

DTC B2180	Front wiper switch (slow) circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and windshield wiper and washer switch (low)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 G and windshield wiper and washer switch terminal I • Windshield wiper and washer switch malfunction • PJB malfunction



Diagnostic procedure

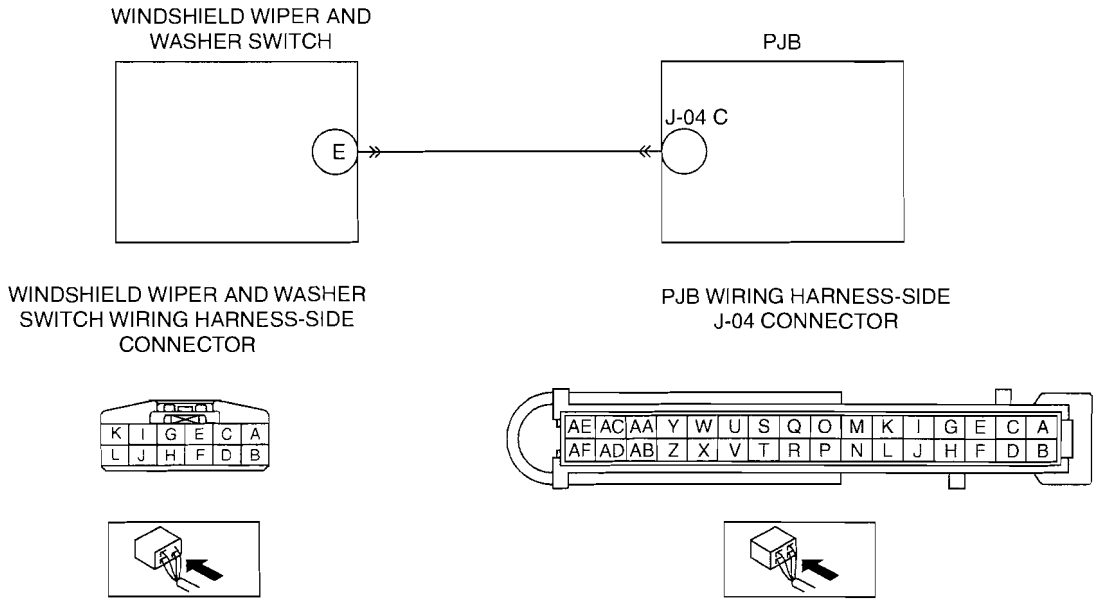
STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 G (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2181[CONTROL SYSTEM]

id0902j0832700

DTC B2181	Front wiper switch (fast) circuit short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and windshield wiper and washer switch (high)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 C and windshield wiper and washer switch terminal E • Windshield wiper and washer switch malfunction • PJB malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

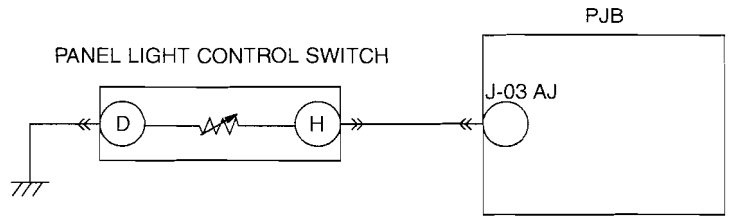
STEP	INSPECTION		ACTION
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 C (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2212[CONTROL SYSTEM]

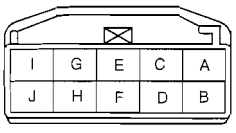
id0902j0835200

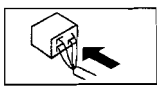
09-02E

DTC B2212	Panel light control circuit failure
DETECTION CONDITION	Input voltage from the panel light control switch is excessively low or high
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-03 AJ and panel light control switch terminal H • Short to power supply in wiring harness between PJB terminal J-03 AJ and panel light control switch terminal H • Short to GND in wiring harness between PJB terminal J-03 AJ and panel light control switch terminal H • Panel light control switch malfunction • PJB malfunction

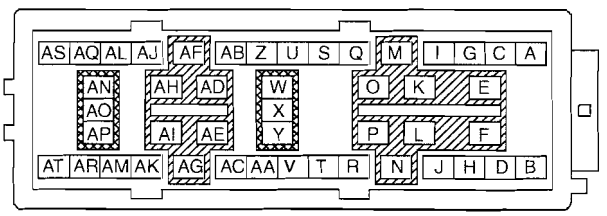


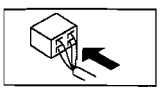
PANEL LIGHT CONTROL SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-03 CONNECTOR





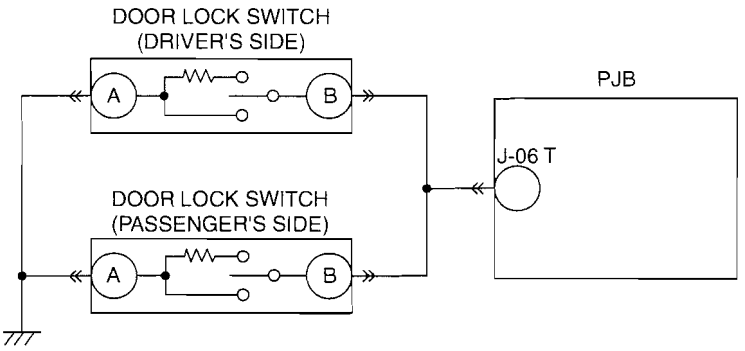
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PANEL LIGHT CONTROL SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the panel light control switch connector. • Inspect the panel light control switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT PANEL LIGHT CONTROL SWITCH CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-03 AJ (wiring harness-side) and panel light control switch terminal H (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 7.
4	**INSPECT PANEL LIGHT CONTROL SWITCH CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-03 AJ (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT PANEL LIGHT CONTROL SWITCH CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-03 AJ (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT PANEL LIGHT CONTROL SWITCH** • Inspect the panel light control switch. (See 09-18-27 PANEL LIGHT CONTROL SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the panel light control switch, then go to the next step. (See 09-18-26 PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

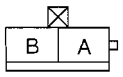
DTC B2218[CONTROL SYSTEM]

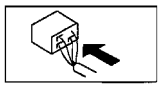
id0902j0839700

DTC B2218	Central locking switch circuit failure
DETECTION CONDITION	Short to GND in wiring harness between PJB and door lock switch (driver's side and passenger's side)
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 T and door lock switch terminal B • Door lock switch malfunction • PJB malfunction

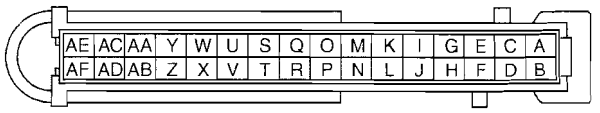


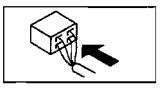
DOOR LOCK SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-06 CONNECTOR





Diagnostic procedure

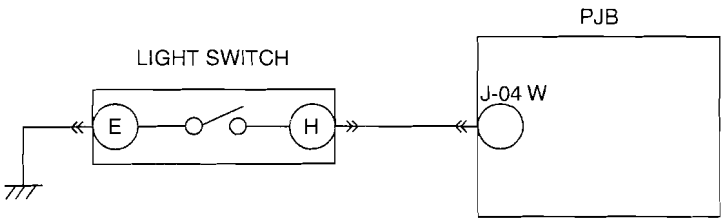
STEP	INSPECTION		ACTION
1	**INSPECT DOOR LOCK SWITCH CONNECTOR** • Disconnect the door lock switch connector. • Inspect the door lock switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT DOOR LOCK SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 T (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT DOOR LOCK SWITCH** • Inspect the door lock switch. (See 09-14-9 DOOR LOCK SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the door lock switch, then go to the next step. (See 09-14-9 DOOR LOCK SWITCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

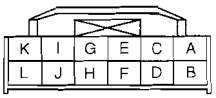
DTC B2254[CONTROL SYSTEM]

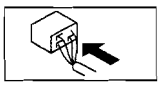
id0902j0835300

DTC B2254	Front fog light switch failure
DETECTION CONDITION	Short to GND in wiring harness between PJB and fog light switch
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-04 W and light switch terminal H • Light switch malfunction • PJB malfunction

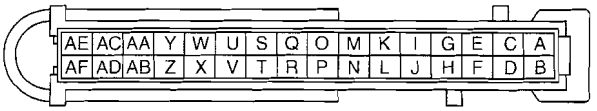


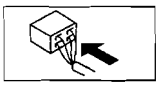
LIGHT SWITCH WIRING HARNESS-SIDE CONNECTOR





PJB WIRING HARNESS-SIDE J-04 CONNECTOR





Diagnostic procedure

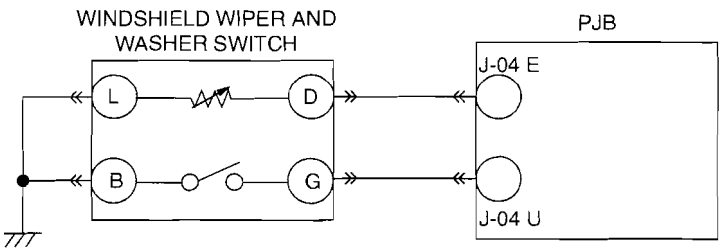
STEP	INSPECTION		ACTION
1	**INSPECT LIGHT SWITCH CONNECTOR** • Disconnect the light switch connector. • Inspect the light switch connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT LIGHT SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 W (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the light switch, then go to the next step. (See 09-18-20 LIGHT SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

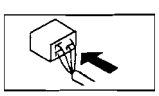
DTC B2259[CONTROL SYSTEM]

id0902j0832800

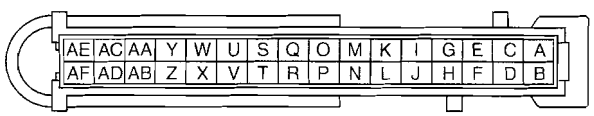
DTC B2259	**Front wiper variable intermittent switch circuit failure** **Intermittent wiper circuit failure**
DETECTION CONDITION	• Input voltage from the windshield wiper and washer switch (INT volume or sensitivity adjustment volume) is excessively low or high • Short to GND in wiring harness between PJB and windshield wiper and washer switch (INT)
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-04 U and windshield wiper and washer switch terminal G • Short to power supply in wiring harness between PJB terminal J-04 U and windshield wiper and washer switch terminal G • Short to GND in wiring harness between PJB terminal J-04 U and windshield wiper and washer switch terminal G • Short to GND in wiring harness between PJB terminal J-04 E and windshield wiper and washer switch terminal D • Windshield wiper and washer switch malfunction • PJB malfunction

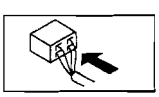


WINDSHIELD WIPER AND WASHER SWITCH WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-04 CONNECTOR





09-02E

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-04 U (wiring harness-side) and windshield wiper and washer switch terminal G (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 8.
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 U (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
5	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-04 U (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
6	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-04 E (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 8.
		No	Go to the next step.
7	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
8	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2477[CONTROL SYSTEM]

id0902j0802300

DTC B2477	Module configuration failure
DETECTION CONDITION	PJB data configuration error
POSSIBLE CAUSE	• Configuration has not been completed. • PJB malfunction

Diagnostic procedure

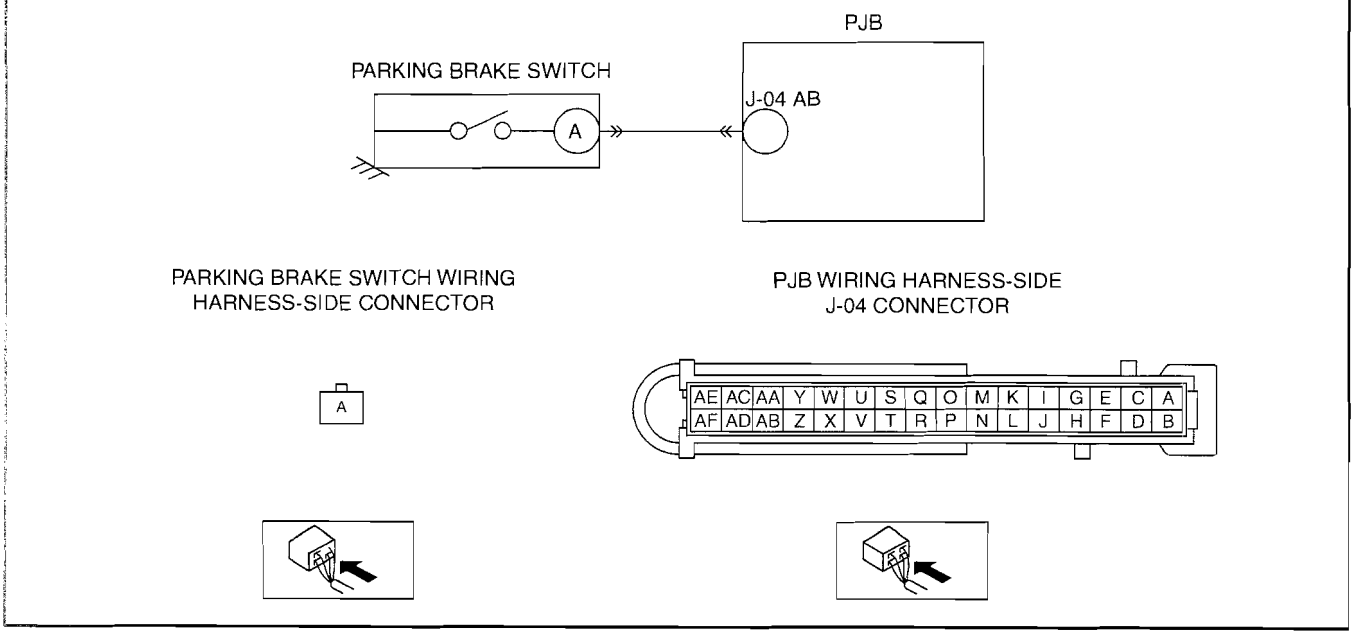
STEP	INSPECTION		ACTION
1	**INSPECT DTC** • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Perform PJB configuration procedure. (See 09-40-16 PASSENGER JUNCTION BOX (PJB) CONFIGURATION.) Go to the next step.
		No	Go to the next step.
2	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

09-02E

DTC B2479[CONTROL SYSTEM]

id0902j0833000

DTC B2479	Park brake switch circuit open
DETECTION CONDITION	Open circuit in wiring harness between PJB and parking brake switch
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-04 AB and parking brake switch terminal A • Parking brake switch malfunction • PJB malfunction



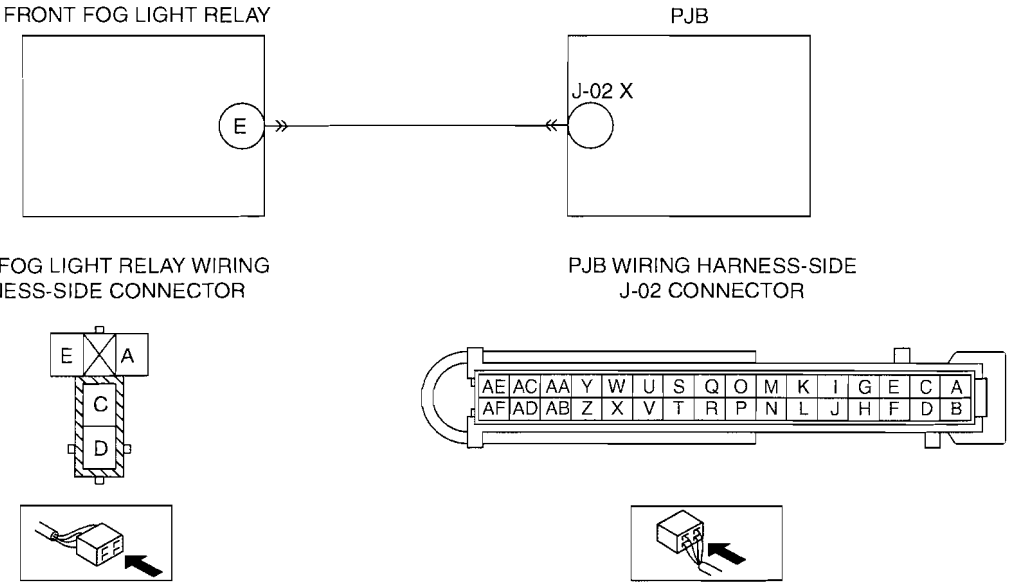
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PARKING BRAKE SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the parking brake switch connector. • Inspect the parking brake switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT PARKING BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-04 AB (wiring harness-side) and parking brake switch terminal A (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT PARKING BRAKE SWITCH** • Inspect the parking brake switch. (See 04-12-4 PARKING BRAKE SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the parking brake switch, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2512[CONTROL SYSTEM]

id0902j0902400

DTC B2512	Front fog relay short to battery
DETECTION CONDITION	Short to power supply or GND in wiring harness between PJB and front fog light relay
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-02 X and front fog light relay terminal E • Short to GND in wiring harness between PJB terminal J-02 X and front fog light relay terminal E • Short to power supply in wiring harness between PJB terminal J-02 X and front fog light relay terminal E • Front fog light relay malfunction • PJB malfunction



Diagnostic procedure

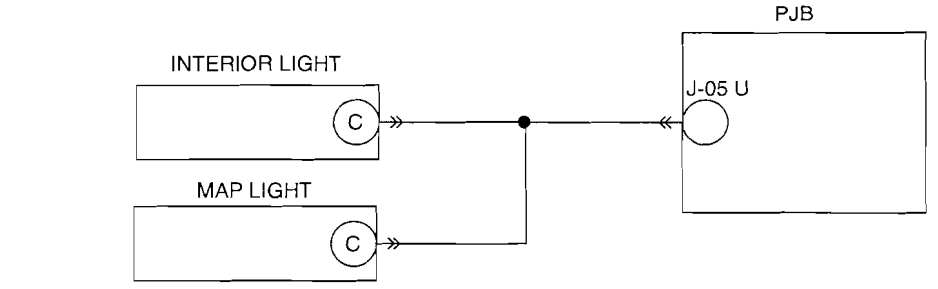
STEP	INSPECTION		ACTION
1	**INSPECT FRONT FOG LIGHT RELAY CONNECTOR** • Turn the ignition switch off. • Disconnect the front fog light relay connector. • Inspect the front fog light relay connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT FRONT FOG LIGHT RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-02 X (wiring harness-side) and front fog light relay terminal E (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 7.
4	**INSPECT FRONT FOG LIGHT RELAY CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-02 X (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT FRONT FOG LIGHT RELAY CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-02 X (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT FRONT FOG LIGHT RELAY** • Inspect the front fog light relay. (See 09-21-3 RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the front fog light relay, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

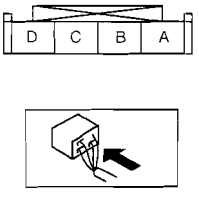
DTC B2555[CONTROL SYSTEM]

id0902j0835500

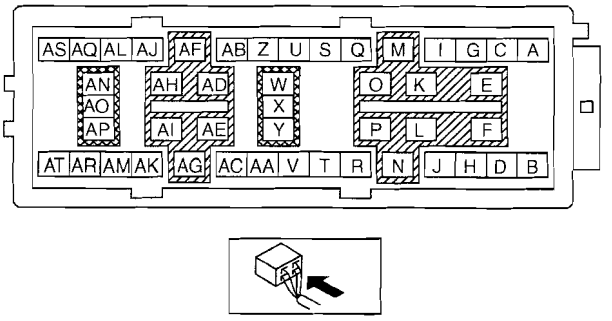
DTC B2555	Dome light output circuit short to battery
DETECTION CONDITION	Open circuit or short to power supply in wiring harness between PJB and interior lights
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-05 U and interior light terminal C • Short to power supply in wiring harness between PJB terminal J-05 U and map light terminal C • Open circuit in wiring harness between PJB terminal J-05 U and interior light terminal C • Open circuit in wiring harness between PJB terminal J-05 U and map light terminal C • Interior light malfunction • Map light malfunction • PJB malfunction



INTERIOR LIGHT OR MAP LIGHT WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-05 CONNECTOR



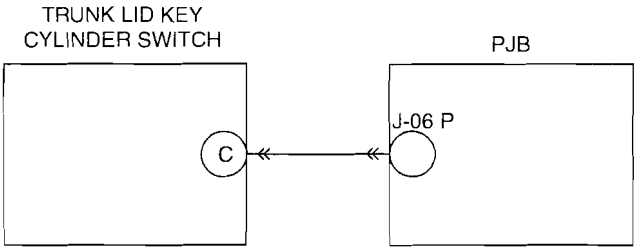
Diagnostic procedure

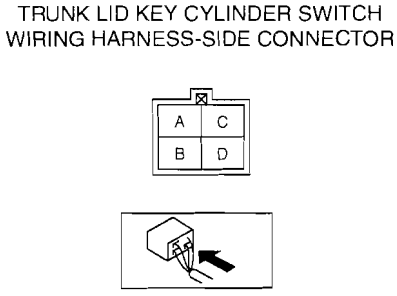
STEP	INSPECTION		ACTION
1	**INSPECT INTERIOR LIGHT AND MAP LIGHT CONNECTORS** • Turn the ignition switch off. • Disconnect the interior light and map light connectors. • Inspect the interior light and map light connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
3	**INSPECT INTERIOR LIGHT AND MAP LIGHT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-05 U (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 6.
		No	Go to the next step.
4	**INSPECT INTERIOR LIGHT AND MAP LIGHT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Turn the ignition switch off. • Inspect for continuity between following terminals: — PJB terminal J-05 U (wiring harness-side) — interior light terminal C (wiring harness-side) — PJB terminal J-05 U (wiring harness-side) — map light terminal C (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 6.
5	**INSPECT INTERIOR LIGHT AND MAP LIGHT** • Inspect the interior light and map light. (See 09-18-24 INTERIOR LIGHT INSPECTION, 09-18-23 MAP LIGHT INSPECTION.) • Is there any malfunction?	Yes	Replace the interior light or map light, then go to the next step. (See 09-18-24 INTERIOR LIGHT REMOVAL/INSTALLATION, 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
		No	Go to the next step.
6	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

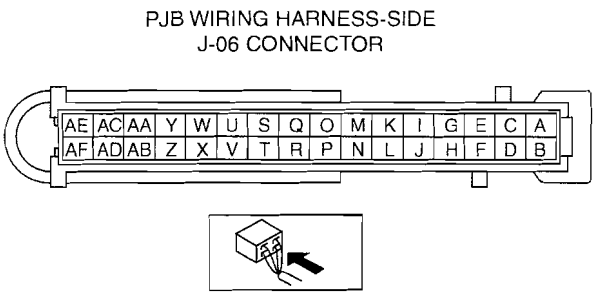
DTC B2559[CONTROL SYSTEM]

id0902j0835600

DTC B2559	Trunk lid lock/unlock switch circuit failure
DETECTION CONDITION	Short to GND in wiring harness between PJB and trunk lid key cylinder switch
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 P and trunk lid key cylinder switch terminal C • Trunk lid key cylinder switch malfunction • PJB malfunction







Diagnostic procedure

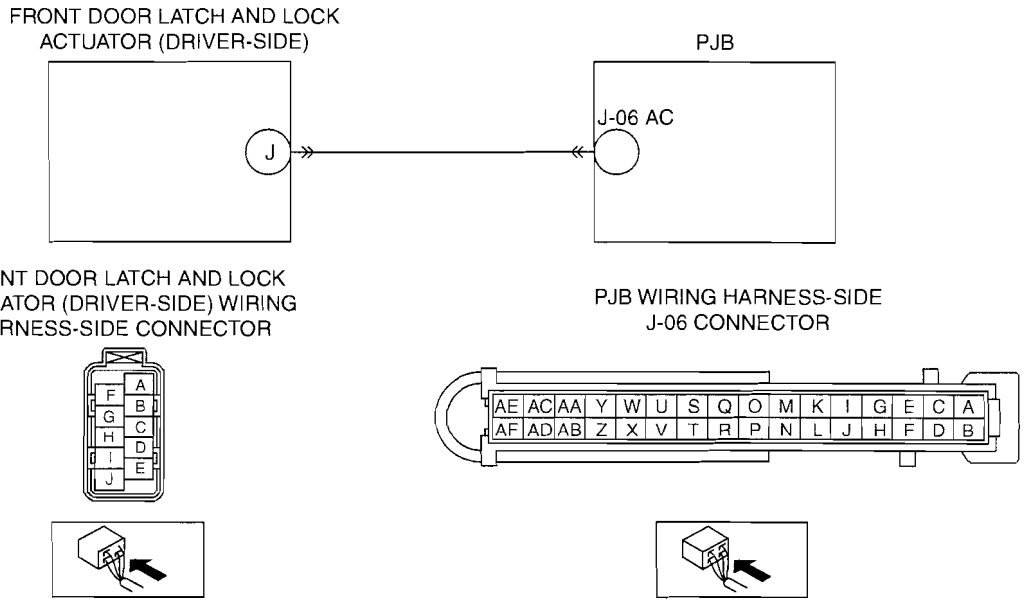
STEP	INSPECTION		ACTION
1	**INSPECT TRUNK LID KEY CYLINDER SWITCH CONNECTOR** • Disconnect the trunk lid key cylinder switch connector. • Inspect the trunk lid key cylinder switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT TRUNK LID KEY CYLINDER SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 P (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT TRUNK LID KEY CYLINDER SWITCH** • Inspect the trunk lid key cylinder switch. (See 09-14-28 TRUNK LID KEY CYLINDER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the trunk lid key cylinder switch, then go to the next step. (See 09-14-28 TRUNK LID KEY CYLINDER REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2574[CONTROL SYSTEM]

id0902j0833100

DTC B2574	Driver door lock switch short to ground
DETECTION CONDITION	Short to GND in wiring harness between PJB and driver-side door lock-link switch
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 AC and front door latch and lock actuator (driver-side) terminal J • Front door latch and lock actuator (driver-side) malfunction • PJB malfunction



Diagnostic procedure

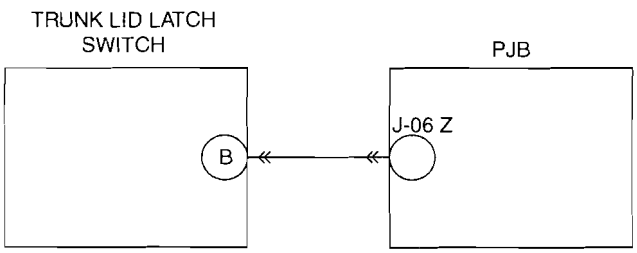
STEP	INSPECTION		ACTION
1	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) CONNECTOR** • Disconnect the front door latch and lock actuator (driver-side) connector. • Inspect the front door latch and lock actuator (driver-side) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.

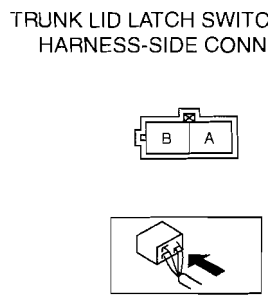
STEP	INSPECTION		ACTION
3	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE) SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 AC (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT FRONT DOOR LATCH AND LOCK ACTUATOR (DRIVER-SIDE)** • Inspect the front door latch and lock actuator (driver-side). (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) • Is there any malfunction?	Yes	Replace the front door latch and lock actuator (driver-side), then go to the next step. (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

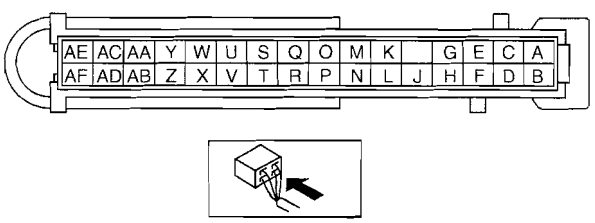
DTC B2721[CONTROL SYSTEM]

id0902j0833300

DTC B2721	**Liftgate/decklid ajar output short to ground**
DETECTION CONDITION	Short to GND in wiring harness between PJB and trunk lid latch switch
POSSIBLE CAUSE	• Short to GND in wiring harness between PJB terminal J-06 Z and trunk lid latch switch terminal B • Trunk lid latch switch malfunction • PJB malfunction







Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TRUNK LID LATCH SWITCH CONNECTOR** • Disconnect the trunk lid latch switch connector. • Inspect the trunk lid latch switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT TRUNK LID LATCH SWITCH SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 Z (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 5.
		No	Go to the next step.
4	**INSPECT TRUNK LID LATCH SWITCH** • Inspect the trunk lid latch switch. (See 09-14-29 TRUNK LID LATCH SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the trunk lid latch switch, then go to the next step. (See 09-14-28 TRUNK LID LATCH REMOVAL/ INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2897[CONTROL SYSTEM]

id0902j0835900

DTC B2897	**Auto light relay circuit failure**
DETECTION CONDITION	Short to power supply in PJB internal circuit between microcomputer and headlight LO relay
POSSIBLE CAUSE	• PJB malfunction

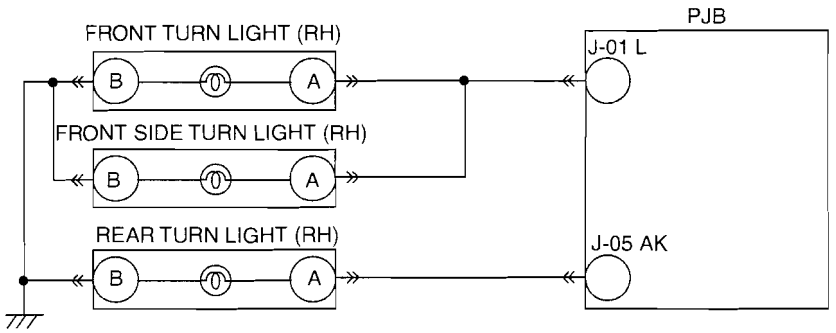
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DTC** • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2898[CONTROL SYSTEM]

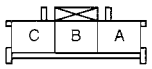
id0902j0836000

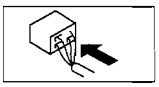
DTC B2898	Right turn signal indicator output failure
DETECTION CONDITION	• Open circuit or short to power supply or GND in wiring harness between PJB and turn light • Turn light bulb malfunction
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 L and front turn light (RH) terminal A or front side turn light (RH) terminal A • Short to power supply in wiring harness between PJB terminal J-01 L and front turn light (RH) terminal A or front side turn light (RH) terminal A • Short to GND in wiring harness between PJB terminal J-01 L and front turn light (RH) terminal A or front side turn light (RH) terminal A • Open circuit in wiring harness between PJB terminal J-05 AK and rear turn light (RH) terminal A • Short to power supply in wiring harness between PJB terminal J-05 AK and rear turn light (RH) terminal A • Short to GND in wiring harness between PJB terminal J-05 AK and rear turn light (RH) terminal A • Turn lights malfunction • PJB malfunction



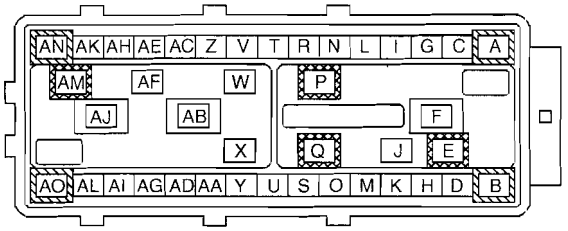
FRONT TURN LIGHT FRONT SIDE TURN LIGHT WIRING HARNESS-SIDE CONNECTOR

REAR TURN LIGHT WIRING HARNESS-SIDE CONNECTOR

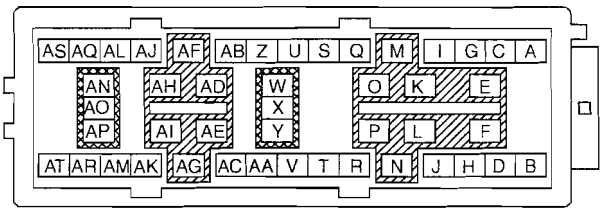


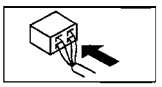


PJB WIRING HARNESS-SIDE J-01 CONNECTOR



PJB WIRING HARNESS-SIDE J-05 CONNECTOR





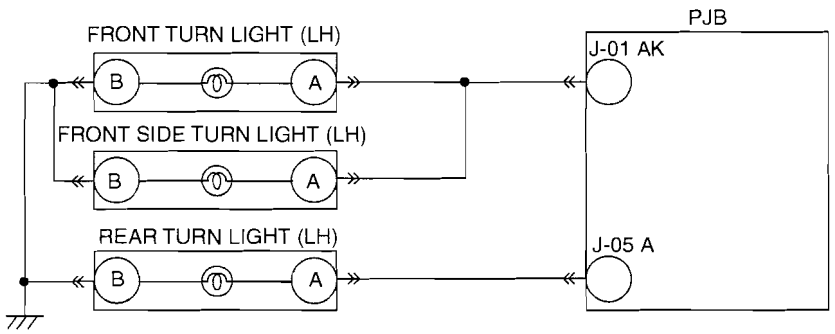
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TURN LIGHT CONNECTOR** • Turn the ignition switch off. • Disconnect all the turn light (RH) connectors. • Inspect all the turn light (RH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following terminals: — PJB terminal J-01 L (wiring harness-side) — front turn light (RH) terminal A (wiring harness-side) — PJB terminal J-01 L (wiring harness-side) — front side turn light (RH) terminal A (wiring harness-side) — PJB terminal J-05 AK (wiring harness-side) — rear turn light (RH) terminal A (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 7.
4	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-01 L (wiring harness-side) — body GND — PJB terminal J-01 L (wiring harness-side) — body GND — PJB terminal J-05 AK (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between following terminals: — PJB terminal J-01 L (wiring harness-side) — body GND — PJB terminal J-01 L (wiring harness-side) — body GND — PJB terminal J-05 AK (wiring harness-side) — body GND • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT TURN LIGHT** • Inspect all the turn lights. • Is there any malfunction?	Yes	Replace the turn lights, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2899[CONTROL SYSTEM]

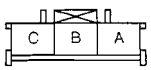
id0902j0836100

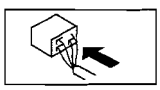
DTC B2899	Left turn signal indicator output failure
DETECTION CONDITION	• Open circuit or short to power supply or GND in wiring harness between PJB and turn light • Turn light bulb malfunction
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AK and front turn light (LH) terminal A or front side turn light (LH) terminal A • Short to power supply in wiring harness between PJB terminal J-01 AK and front turn light (LH) terminal A or front side turn light (LH) terminal A • Short to GND in wiring harness between PJB terminal J-01 AK and front turn light (LH) terminal A or front side turn light (LH) terminal A • Open circuit in wiring harness between PJB terminal J-05 A and rear turn light (LH) terminal A • Short to power supply in wiring harness between PJB terminal J-05 A and rear turn light (LH) terminal A • Short to GND in wiring harness between PJB terminal J-05 A and rear turn light (LH) terminal A • Turn lights malfunction • PJB malfunction



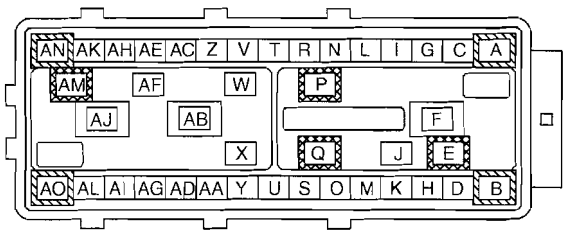
FRONT TURN LIGHT FRONT SIDE TURN LIGHT WIRING HARNESS-SIDE CONNECTOR

REAR TURN LIGHT WIRING HARNESS-SIDE CONNECTOR

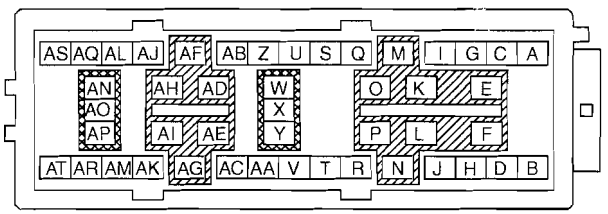


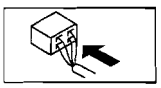


PJB WIRING HARNESS-SIDE J-01 CONNECTOR



PJB WIRING HARNESS-SIDE J-05 CONNECTOR





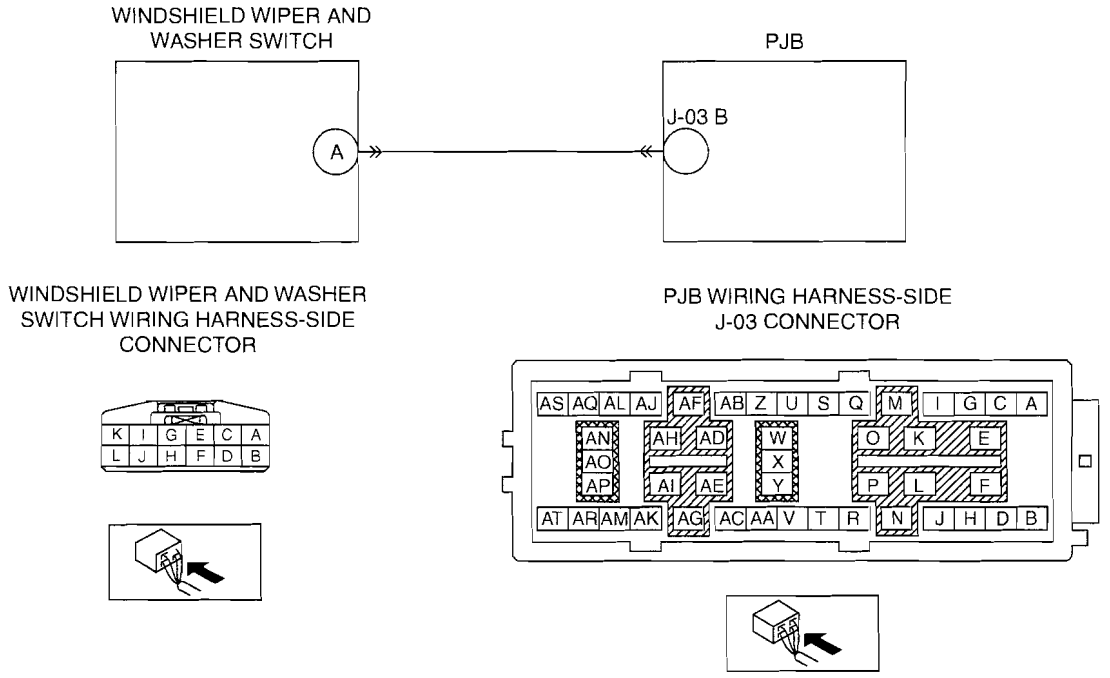
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TURN LIGHT CONNECTOR** • Turn the ignition switch off. • Disconnect all the turn light (LH) connectors. • Inspect all the turn light (LH) connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
3	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following terminals: — PJB terminal J-01 AK (wiring harness-side) — front turn light (LH) terminal A (wiring harness-side) — PJB terminal J-01 AK (wiring harness-side) — front side turn light (LH) terminal A (wiring harness-side) — PJB terminal J-05 A (wiring harness-side) — rear turn light (LH) terminal A (wiring harness-side) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 7.
4	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between following terminals: — PJB terminal J-01 AK (wiring harness-side) — body GND — PJB terminal J-01 AK (wiring harness-side) — body GND — PJB terminal J-05 A (wiring harness-side) — body GND • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 7.
		No	Go to the next step.
5	**INSPECT TURN LIGHT CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between following terminals: — PJB terminal J-01 AK (wiring harness-side) — body GND — PJB terminal J-01 AK (wiring harness-side) — body GND — PJB terminal J-05 A (wiring harness-side) — body GND • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
6	**INSPECT TURN LIGHT** • Inspect all the turn lights. • Is there any malfunction?	Yes	Replace the turn lights, then go to the next step.
		No	Go to the next step.
7	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

DTC B2966[CONTROL SYSTEM]

id0902j0836200

DTC B2966	Front washer switch stuck
DETECTION CONDITION	Windshield washer switch stuck ON position
POSSIBLE CAUSE	• Short to power supply in wiring harness between PJB terminal J-03 B and windshield wiper and washer switch terminal A • Windshield wiper and washer switch malfunction • PJB malfunction



Diagnostic procedure

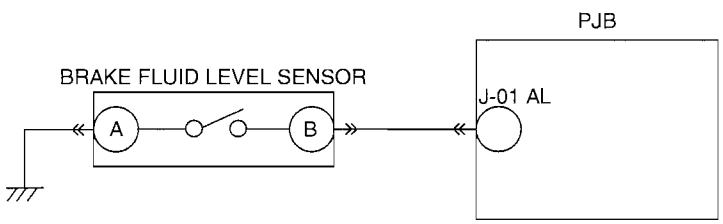
STEP	INSPECTION		ACTION
1	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH CONNECTOR** • Turn the ignition switch off. • Disconnect the windshield wiper and washer switch connector. • Inspect the windshield wiper and washer switch connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-03 B (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 5.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT WINDSHIELD WIPER AND WASHER SWITCH** • Inspect the windshield wiper and washer switch. (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the windshield wiper and washer switch, then go to the next step. (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Turn the ignition switch to LOCK position then ON position. • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	DTC troubleshooting completed.

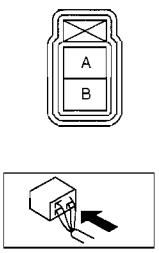
DTC C1189[CONTROL SYSTEM]

id0902j0836600

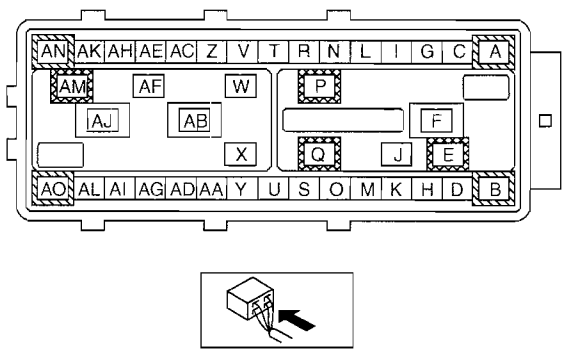
DTC C1189	**Brake fluid level sensor input circuit open**
DETECTION CONDITION	Open circuit in wiring harness between PJB and brake fluid level sensor
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-01 AL and brake fluid level sensor terminal B • Open circuit in wiring harness between brake fluid level sensor terminal A and body GND • Brake fluid level sensor malfunction • PJB malfunction



BRAKE FLUID LEVEL SENSOR WIRING HARNESS-SIDE CONNECTOR



PJB WIRING HARNESS-SIDE J-01 CONNECTOR



09-02E

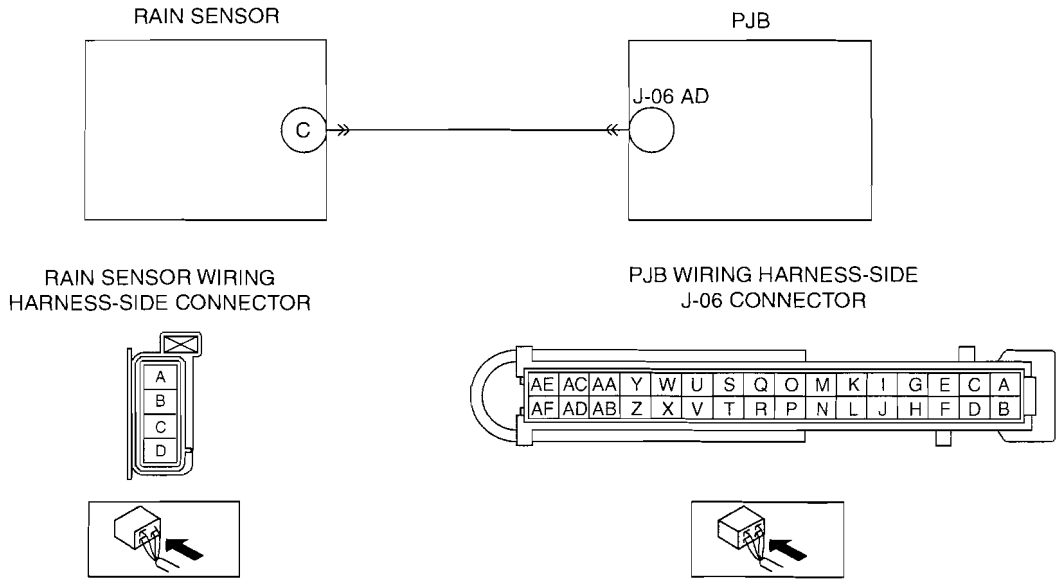
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BRAKE FLUID LEVEL SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the brake fluid level sensor connector. • Inspect the brake fluid level sensor connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 5.
		No	Go to the next step.
3	**INSPECT BRAKE FLUID LEVEL SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between following terminals: — PJB terminal J-01 AL (wiring harness-side) — brake fluid level sensor terminal B (wiring harness-side) — Brake fluid level sensor terminal A (wiring harness-side) — body GND • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 5.
4	**INSPECT BRAKE FLUID LEVEL SENSOR** • Inspect the brake fluid level sensor. (See 04-11-11 BRAKE FLUID LEVEL SENSOR INSPECTION.) • Is there any malfunction?	Yes	Replace the brake fluid level sensor, then go to the next step.
		No	Go to the next step.
5	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	Troubleshooting completed.

DTC U2030[CONTROL SYSTEM]

id0902j0833400

DTC U2030	Rain sensor communication fault (If equipped, for Canada only.)
DETECTION CONDITION	Communication error to rain sensor
POSSIBLE CAUSE	• Open circuit in wiring harness between PJB terminal J-06 AD and rain sensor terminal C • Short to power supply in wiring harness between PJB terminal J-06 AD and rain sensor terminal C • Short to GND in wiring harness between PJB terminal J-06 AD and rain sensor terminal C • Rain sensor malfunction • PJB malfunction



09-02E

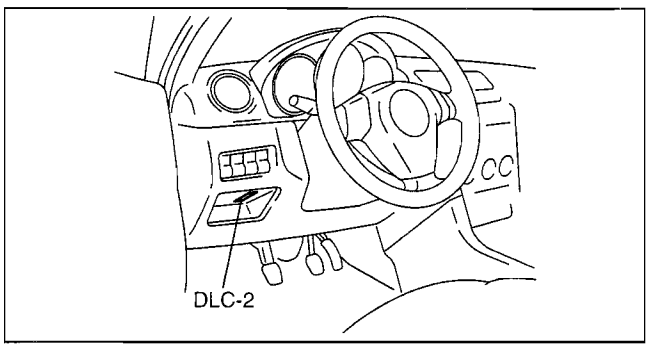
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT RAIN SENSOR CONNECTOR** • Turn the ignition switch off. • Disconnect the rain sensor connector. • Inspect the rain sensor connector terminals for poor connection (such as damaged/ pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
2	**INSPECT PJB CONNECTOR** • Disconnect the PJB connector. • Inspect the PJB connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
3	**INSPECT RAIN SENSOR CIRCUIT FOR OPEN CIRCUIT** • Inspect for continuity between PJB terminal J-06 AD (wiring harness-side) and rain sensor terminal C (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 6.
4	**INSPECT RAIN SENSOR SIGNAL CIRCUIT FOR SHORT TO GND** • Inspect for continuity between PJB terminal J-06 AD (wiring harness-side) and body GND. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to GND, then go to Step 6.
		No	Go to the next step.

STEP	INSPECTION		ACTION
5	**INSPECT RAIN SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Turn the ignition switch to the ON position (Engine off). • Measure the voltage between PJB terminal J-06 AD (wiring harness-side) and body GND. • Is the voltage **B+**?	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to the next step.
		No	Replace the Rain sensor, then go to the next step. (See 09-19-16 RAIN SENSOR REMOVAL/ INSTALLATION.)
6	**VERIFY TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PJB memory using the M-MDS. • Perform the self-test. (See 09-02E-68 PJB SELF-TEST[CONTROL SYSTEM].) • Is the same DTC present?	Yes	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
		No	Troubleshooting completed.

PJB SELF-TEST[CONTROL SYSTEM]

id0902j0836800



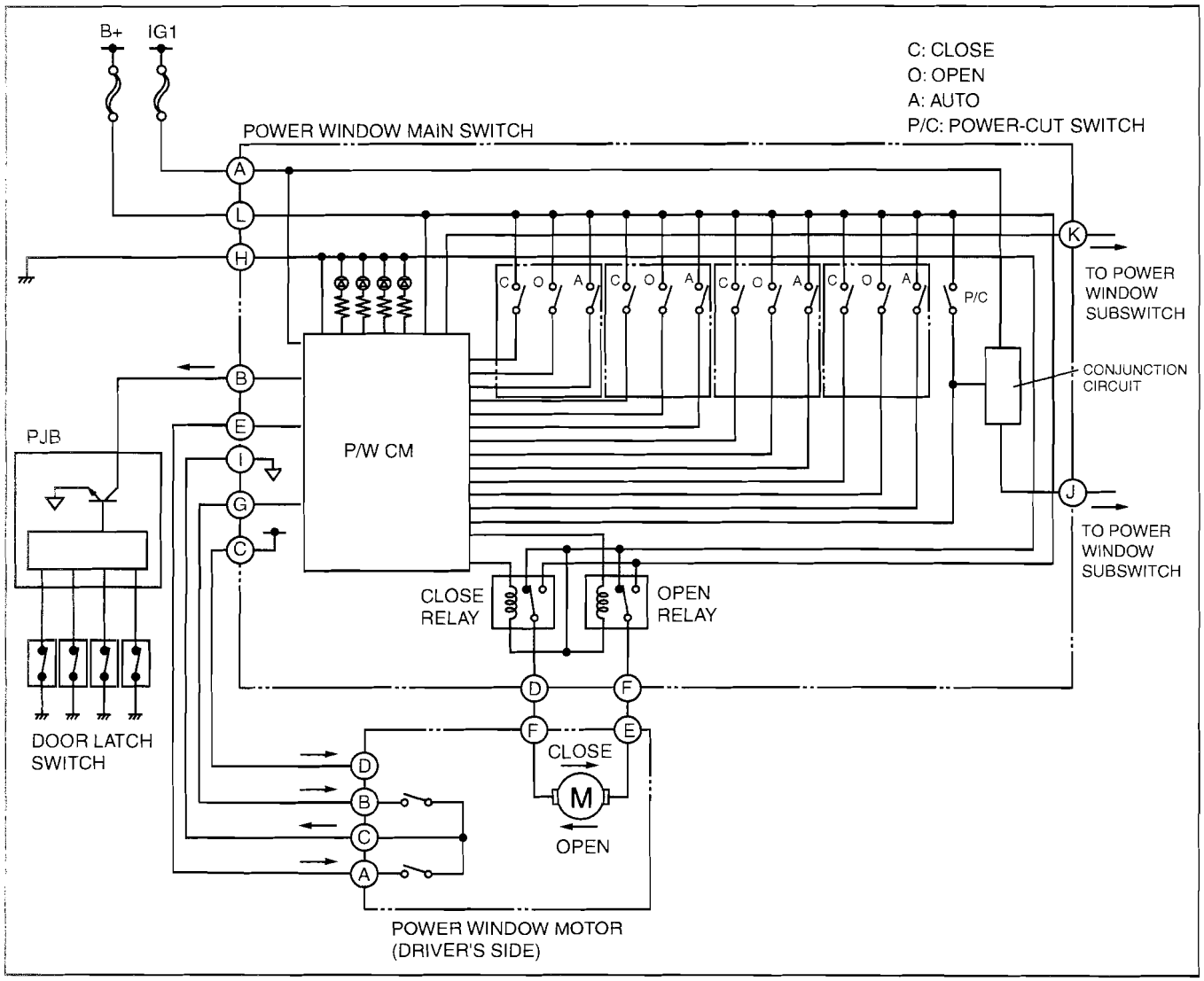
B3E0102W003

1. Connect the M-MDS to the DLC-2.
2. Set up the M-MDS (including the vehicle recognition).
3. Verify the following vehicle conditions:
   - Ignition switch is at ON position.
   - All the switches are turned off (except the ignition switch).
   - All the doors, hood, and trunk lid or liftgate are closed.
   - All the doors, and trunk lid or liftgate are unlocked.
   - Parking brake lever is pulled.
4. Perform procedures according to directions on the M-MDS screen.
5. Verify if any DTCs are displayed.
   - If any DTCs are displayed, perform the troubleshooting according to the corresponding DTC inspection.
6. Disconnect the M-MDS.

09-03A SYMPTOM TROUBLESHOOTING [POWER WINDOW SYSTEM]

POWER WINDOW SYSTEM WIRING DIAGRAM[POWER WINDOW SYSTEM]

id0903a0822500

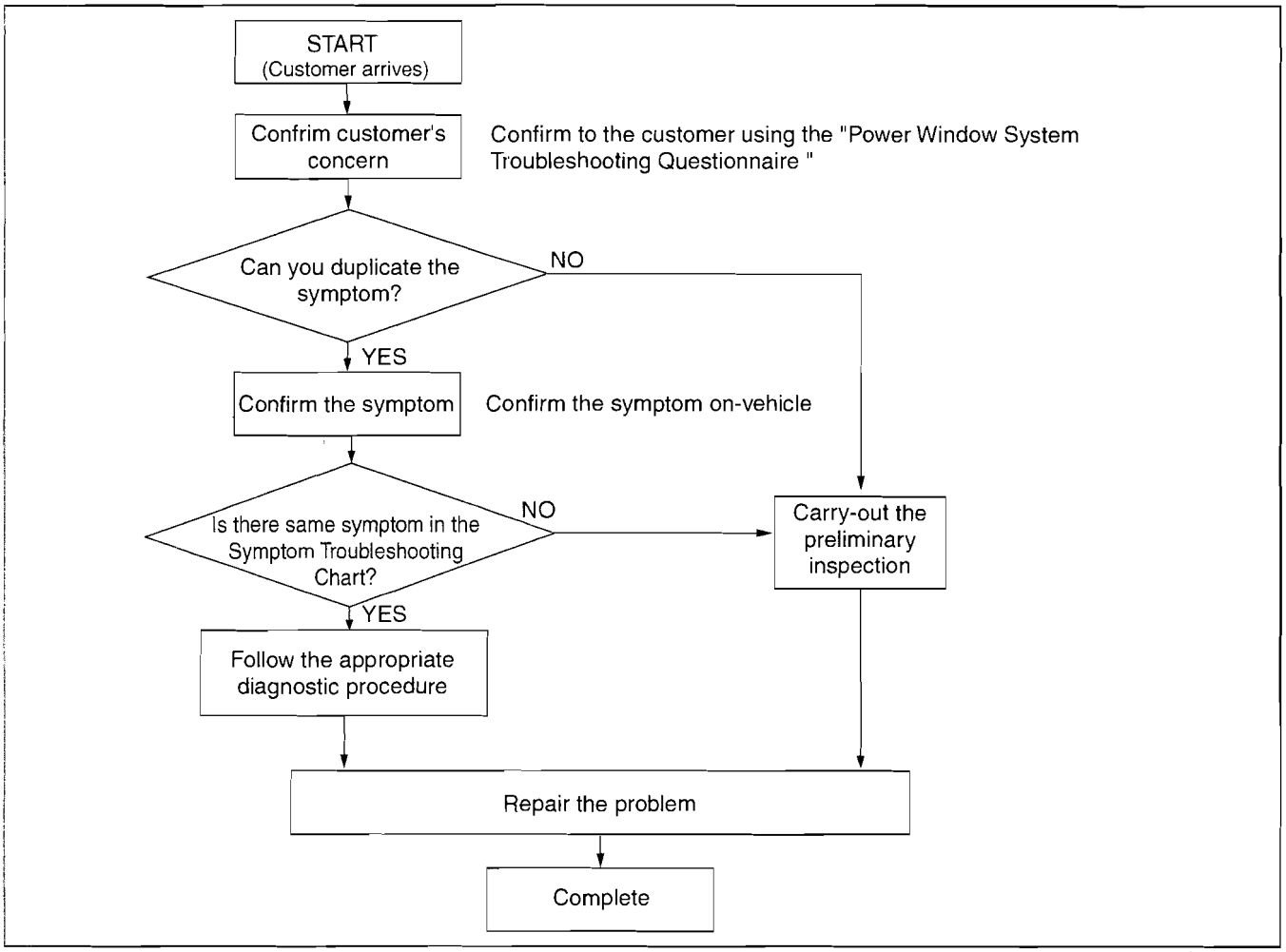


am3zzw0000214

FOREWORD[POWER WINDOW SYSTEM]

id0903a0805400

Troubleshooting Procedure



am3uuw0000015

- Slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions.

POWER WINDOW SYSTEM TROUBLESHOOTING QUESTIONNAIRE[POWER WINDOW SYSTEM]

id0903a0835500

Date :

When did the malfunction first occur ?				
Weather conditions	☐Fair weather ☐Cloudy ☐Rain ☐Snow ☐Other ( )		Outside temperature	Approx. °F
Driving conditions	☐Driving ☐Stopped (Engine is : ☐Running ☐Stopped)			
Duplicate symptom?	☐YES ☐NO	Frequency	☐Always ☐Sometimes (times/month)	
Road conditions	☐City ☐Outer city ☐Freeway ☐Other ( ) / ☐Paved ☐Dirt road			

*Follow the appropriate diagnostic procedures shown below or perform the basic troubleshooting flow.

☐(No.1) The auto open function on the driver's side power window inoperative.

☐(No.2) The driver's side power window is inoperative.

☐(No.3) All power windows other than driver's side do not operate using the power window subswitch.

☐(No.4) All power windows other than driver's side do not operate using the power window main switch.

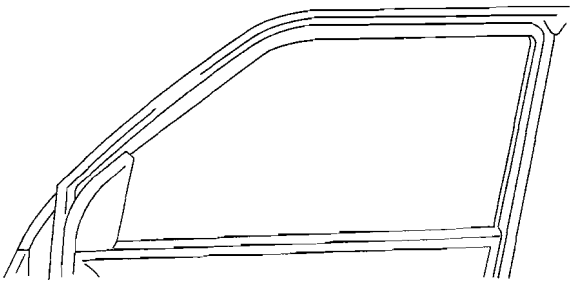
☐(No.5) All power windows are inoperative.

☐(No.6) Door glass reverses even though the glass does not encounter a foreign object while it is moving up in automatic mode.

Please clarify the position where the driver side front door glass opens automatically. ☐Completely closed position
☐Approx. ( )mm lower than completely closed position ☐Approx. ( )mm upper than the completely open position.

☐(No.7) Abnormal noise while the door glass is opening or closing.

☐Other (Describe the symptom below if the symptom does not appear in the above list.)



Please describe the conditions when the malfunction occurs.
(Example) : When the outer mirrors are operated

Please describe the conditions under which the system returns to normal operation after malfunctioning.
(Example) : The ignition switch is turned to the ON position after inserting the ignition key into the key cylinder

am3uuw0000054

SYMPTOM TROUBLESHOOTING CHART[POWER WINDOW SYSTEM]

id0903a0805600

No.	Malfunction symptom
1	09-03A-6 No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]
2	09-03A-6 No.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]
3	09-03A-7 No.3 ALL POWER WINDOWS OTHER THAN DRIVER'S SIDE DO NOT OPERATE USING THE POWER WINDOW SUBSWITCH[POWER WINDOW SYSTEM]
4	09-03A-7 No.4 ALL POWER WINDOWS OTHER THAN DRIVER'S SIDE DO NOT OPERATE USING THE POWER WINDOW MAIN SWITCH[POWER WINDOW SYSTEM]
5	09-03A-8 No.5 ALL POWER WINDOWS ARE INOPERATIVE[POWER WINDOW SYSTEM]
6	09-03A-10 No.6 DOOR GLASS REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS MOVING UP IN AUTOMATIC MODE[POWER WINDOW SYSTEM]
7	09-03A-12 No.7 ABNORMAL NOISE WHILE THE DOOR GLASS IS OPENIGN OR CLOSING[POWER WINDOW SYSTEM]

POWER WINDOW SYSTEM PRELIMINARY INSPECTION[POWER WINDOW SYSTEM]

id0903a0831700

Manual Open/close Function Inspection

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Operate the power window using the manual open/close function on the power window main switch. • Does the power window operate properly?	Yes	Go to the next step.
		No	• Inspect the power window main switch and the wiring harness. • Repair or replace malfunctioning parts.
2	• Set the power cut switch to the UNLOCK position. • Operate the power window using the power window subswitch. • Does the power window operate properly?	Yes	Go to the next step.
		No	• Inspect the power window subswitch and the wiring harness. • Repair or replace malfunctioning parts.
3	• Set the power cut switch to the LOCK position. • Operate all power windows other than the driver side. • Does the power window operate properly?	Yes	• Inspect the power cut switch and the wiring harness. • Replace the power window main switch.
		No	• Manual open/close function is normal. • Perform the auto open/close function inspection.

Auto Open Function (Driver's Side) Inspection

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Operate the power window using the auto open function on the power window main switch. • Does the power window operate properly?	Yes	Go to the next step.
		No	Go to 09-03A-6 No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM].
2	• Operate the power window main switch to the close position while the power window is opening. • Does the power window operation stop?	Yes	Auto open function is normal.
		No	• Replace the power window main switch (power window control unit is malfunctioning.)

No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]

id0903a0841100

1	The auto open function on the driver's side power window is inoperative
POSSIBLE CAUSE	• No power supply to power window main switch • Power window main switch malfunction (power window control unit malfunction, auto switch malfunction)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Perform the Auto Open Function (Driver's side) Inspection in the POWER WINDOW SYSTEM PRELIMINARY INSPECTION. (See 09-03A-5 POWER WINDOW SYSTEM PRELIMINARY INSPECTION[POWER WINDOW SYSTEM].) • Is the malfunctioning part detected?	Yes	Repair or replace malfunctioning part according to inspection results.
		No	Go to NO.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE.

No.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]

id0903a0831100

2	The driver's side power window is inoperative.
POSSIBLE CAUSE	• Power supply circuit or ground circuit malfunction — Burnt fuse — Open or short circuit in wiring harness between fuse and power window main switch — Open or short circuit in wiring harness between power window main switch and power window motor — Open or short circuit in wiring harness between power window main switch and ground • Power window main switch malfunction • Power window motor malfunction • Power window regulator malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Does the LED on the power window main switch illuminate?	Yes	Go to Step 4.
		No	Go to the next step.
2	• Operate all power windows other than the driver's side window using the power window main switch. • Does the power window operate properly?	Yes	Go to the next step.
		No	Inspect for an open or short circuit in the following wiring harnesses. Inspect the connector connections (damage/pulled-out pins, corrosion): • P/WIND L 30A fuse (at PJB)—PJB terminal AO—Power window main switch terminal E • Power window main switch terminal L—ground. Repair or replace if necessary.
3	• Is the P/WIND L 30 A fuse (at PJB) normal?	Yes	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.)
		No	Inspect the following: • Short circuit in B+ power supply wiring harness • Short circuit in power window motor Repair or replace if necessary. Replace with the appropriate standard fuse.
4	• Measure the voltage at the power window main switch. (power window motor output terminal) while operating the power window using the power window main switch. • Is the voltage B+? (Open: terminal P/ close: terminal N)	Yes	Go to the next step.
		No	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.)
5	• Measure the voltage at the power window motor. (battery power supply terminal) while operating the power window using the power window motor. • Is the voltage B+? (Open: terminal E/ close: terminal F)	Yes	Go to the next step.
		No	Inspect for an open or short circuit in the wiring harness between the power window main switch and the power window motor. Inspect the power window main switch and power window motor connector connections. (damage/pulled-out pins, corrosion) Repair or replace if necessary.

STEP	INSPECTION		ACTION
6	• Operate the driver's side power window using the power window main switch. • Does the power window motor operate (rotate)? **Caution** • **If the power window motor temperature is high, the motor may not rotate due to the motor internal bimetal function. Leave it untouched for about 3 min to cool it down, then reinspect.**	Yes	Go to the next step.
		No	Replace the power window motor. (See 09-12-12 POWER WINDOW MOTOR REMOVAL/INSTALLATION.)
7	• Remove the door glass from the carrier plate. • Make sure that the door glass moves smoothly using your hand. • Does the door glass move smoothly?	Yes	Replace the power window regulator. (See 09-12-8 FRONT POWER WINDOW REGULATOR REMOVAL/ INSTALLATION.)
		No	Inspect for a bent regulator guide or other possible malfunction. If normal, replace the door glass run-channel.

No.3 ALL POWER WINDOWS OTHER THAN DRIVER'S SIDE DO NOT OPERATE USING THE POWER WINDOW SUBSWITCH[POWER WINDOW SYSTEM]

id0903a0831200

3	**All power windows other than driver's side do not operate using the power window subswitch.**
POSSIBLE CAUSE	• Open or short circuit in power window subswitch wiring harness (battery power supply circuit). • Power window subswitch malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Set the power cut-switch to the UNLOCK position. • Measure the voltage at power window subswitch terminal A. • Is the voltage B+?	Yes	Replace the power window subswitch. (See 09-12-15 POWER WINDOW SUBSWITCH REMOVAL/ INSTALLATION.)
		No	Inspect for an open or short circuit in the wiring harness between PJM terminal AO (left rear), terminal AN (right front, right rear) and the power window subswitch. Inspect the power window subswitch connector connection. (damage/pulled-out pins, corrosion) Repair or replace if necessary.

No.4 ALL POWER WINDOWS OTHER THAN DRIVER'S SIDE DO NOT OPERATE USING THE POWER WINDOW MAIN SWITCH[POWER WINDOW SYSTEM]

id0903a0831300

4	**All power windows other than driver's side do not operate using the power window main switch**
POSSIBLE CAUSE	• Open or short circuit in wiring harness between ignition switch (IG1) and power window main switch (IG1). • Power window main switch malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Set the power cut-switch to the UNLOCK position. • Operate all power windows other than the driver's side using the power window main switch. • Do any power windows operate?	Yes	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/ INSTALLATION.)
		No	Inspect for an open or short circuit in the power window main switch wiring harness (battery power supply). Inspect the power window main switch connector connection. (damage/pulled-out pins, corrosion) Repair or replace if necessary.

No.5 ALL POWER WINDOWS ARE INOPERATIVE[POWER WINDOW SYSTEM]

id0903a0831400

5	**All power windows are inoperative.**
POSSIBLE CAUSE	• Power supply circuit or ground circuit malfunction — Burnt fuse — Open or short circuit in wiring harness between ignition switch and power window main switch — Open or short circuit in wiring harness between power window main switch and power window subswitch — Open or short circuit in wiring harness between power window main switch and power window motor — Open or short circuit in wiring harness between power window main switch and ground • Power window main switch malfunction (power cut-off switch malfunction, switch malfunction) • Power window subswitch malfunction • Power window motor malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Set the power cut-off switch to the UNLOCK position. • Inspect the power window system operation again. • Does the system operate properly?	Yes	System is now normal (power cut-off switch is not set properly.)
		No	Go to the next step.
2	• Operate all power windows other than driver's side window using the power window main switch. • Does any power window operate?	Yes	Go to Step 5.
		No	Go to the next step.
3	• Operate the driver's side power window using the power window main switch. • Does the power window operate?	Yes	Go to the next step.
		No	Inspect for an open circuit in the wiring harness between the power window main switch and the body ground. Inspect the power window main switch connector connection. (damage/pulled-out pins, corrosion) Repair or replace if necessary
4	• Are P/WIND L 30A fuse and P/WIND R 30A fuse (at PJB) normal?	Yes	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.)
		No	Replace with the appropriate standard fuse. If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.
5	• Identify the inoperative power window. • Measure the voltage at the suspect power window motor (battery power supply) while operating the power window motor using the suspect power window subswitch • Is the voltage B+? (Open: terminal E/ close: terminal F)	Yes	Go to the next step.
		No	Go to Step 8.
6	• Operate the power window using the power window subswitch • Does the power window motor operate (rotate)? **Caution** • **If the power window motor temperature is high, the motor may not rotate due to the motor internal bimetal function. Leave it untouched for about 3 min to cool it down, then reinspect.**	Yes	Go to the next step.
		No	Replace the power window motor. (See 09-12-12 POWER WINDOW MOTOR REMOVAL/INSTALLATION.)
7	• Remove the door glass from the carrier plate. • Make sure that the door glass moves smoothly using your hand. • Does the door glass move smoothly?	Yes	Replace the power window regulator guide.
		No	Inspect for a bent regulator guide or other possible malfunction. If normal, replace the glass run channel

STEP	INSPECTION		ACTION
8	• Measure the voltage at the power window subswitch (power window motor output) while operating the power window subswitch. • Is the voltage B+? (Open: terminal F/ close: terminal C)	Yes	Inspect for an open or short circuit in the wiring harness between the power window subswitch and power window motor Inspect the power window subswitch and power window motor connector connections. (damage/pulled-out pins, corrosion) Repair or replace if necessary.
		No	Go to the next step.
9	**Note** • Do not operate the power window subswitch during the following inspection. • Inspect the continuity between power window subswitch terminal D (vehicle harness-side) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Inspect for an open or short circuit in the power window subswitch wiring harness. Inspect the power window subswitch connector connection. (damage/pulled-out pins, corrosion) Repair or replace if necessary. Then go to Step 12.
10	**Note** • Do not operate the power window subswitch during the following inspection. • Inspect the continuity between power window subswitch terminal E and ground. • Is there continuity?	Yes	Replace the power window subswitch. (See 09-12-15 POWER WINDOW SUBSWITCH REMOVAL/ INSTALLATION.)
		No	Inspect for an open or short circuit in the power window subswitch wiring harness. Inspect the power window subswitch connector connection. (damage/pulled-out pins, corrosion) Repair or replace if necessary. Then go to the next step.
11	**Note** • Do not operate the power window main switch during the following inspection. • Inspect the continuity between the power window main switch terminal (up-side A, D, K) and ground. • Is there continuity?	Yes	Go to the next step.
		No	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/ INSTALLATION.)
12	**Note** • Do not operate the power window main switch during the following inspection. • Inspect the continuity between the power window main switch terminal (down-side B, C, M) and ground. • Is there continuity?	Yes	Inspect for an open or short circuit in the wiring harness between the power window main switch and power window subswitch. Inspect the power window main switch and subswitch connector connections. (damage/pulled-out pins, corrosion) Repair or replace if necessary.
		No	Replace the power window main switch. (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/ INSTALLATION.)

No.6 DOOR GLASS REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS MOVING UP IN AUTOMATIC MODE[POWER WINDOW SYSTEM]

id0903a0831500

Note

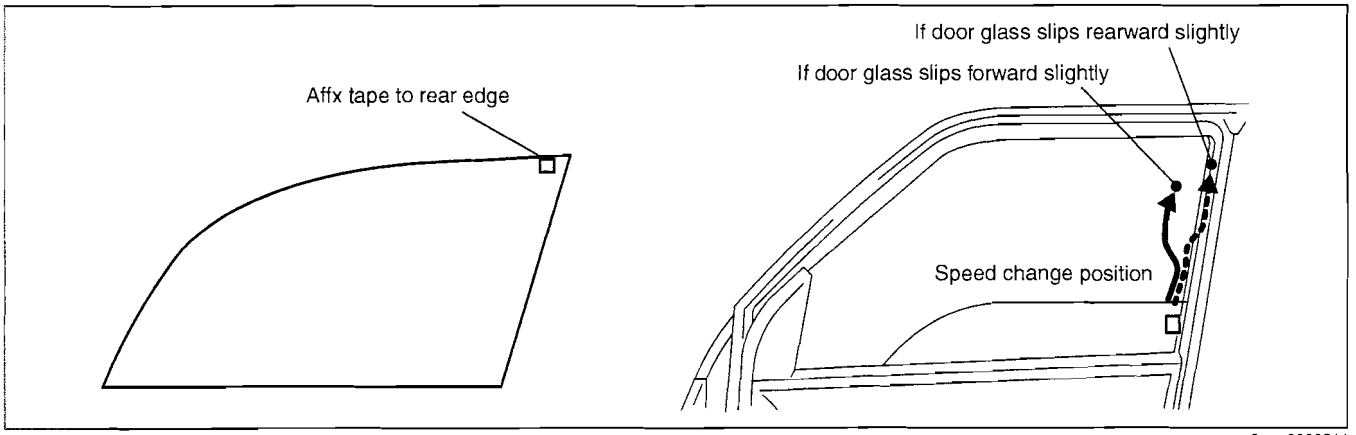
- Perform the following inspection for the power window system component parts of windows where the door glass reverses even though the glass does not encounter a foreign object while it is moving up in automatic mode.

6	**Door glass reverses even though the glass does not encounter a foreign object while it is moving up in automatic mode.**
POSSIBLE CAUSE	• Extreme change in the sliding resistance of the glass while the door glass is closing. — Improper installation of the acrylic door visor. — Power window motor malfunction — Object caught between the glass run channel and the door glass. — Insufficient tightening of the door glass to the carrier plate. — Glass run channel malfunction. — Glass guide related malfunction. **Note** • The auto-reverse pinch protection function is a mechanism that automatically reverses (opens) the door glass while it is closing when the power window main switch detects the signal from the power window motor indicating that an object is obstructing the door glass movement. • The auto-reverse pinch protection function may operate if the sliding resistance of the door glass increases causing the closing speed to decrease. • If the door glass closing speed has changed, concentrate the inspection on the following locations: (Slip occurrence) — If the door glass is slipping forward, inspect the front side of the glass guide or glass run channel. — If the door glass is slipping rearward, inspect the rear side of the glass guide or glass run channel.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT MALFUNCTION SYMPTOM** • Does the malfunction symptom occur only under the following special conditions?: — Driving over railroad tracks — Driving on bumpy roads. — Opening/closing the door.	Yes	The system is normal (Explain to the customer that this does not indicate a malfunction because the system is designed to reverse the door glass while it is closing if it receives vibration when the vehicle is crossing railroad tracks, driving on a bumpy road, or when the door is opened/closed.)
		No	Go to the next step.
2	**INSPECT ACRYLIC DOOR VISOR INSTALLATION CONDITION** • Is the acrylic door visor normal?	Yes	Go to the next step.
		No	Install the side visor properly, then go to the next step.
3	**INSPECT DOOR GLASS CLOSING SPEED** • Affix tape to the rear edge of the door glass as shown in the figure for placing marks (to facilitate seeing the door glass movement) • Start the engine and idle it (to ensure a stabilized operational voltage). • Does the door glass hesitate only once while its closing?	Yes	Mark the point where the door glass closing speed changed, then go to Step 5.
		No	Go to the next step.
4	**REINSPECT DOOR GLASS CLOSING SPEED** • Does the door glass hesitate periodically (5-6 times) while it is closing?	Yes	Replace the power window motor, then go to Step 8 (See 09-12-12 POWER WINDOW MOTOR REMOVAL/ INSTALLATION.)
		No	Go to Step 8.
5	**INSPECT GLASS RUN CHANNEL AND DOOR GLASS SLIDING SURFACE** • Is there an object caught between the glass run channel and the door glass, or is there roughness on the sliding surface (rubber surface)?	Yes	**Object is caught between glass run channel and door glass:** • Remove the object. **Roughness on the sliding surface (rubber surface):** • Replace the glass run channel. After performing one of the above actions, reinspect. If the malfunction is not corrected, go to Step 3.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	**INSPECT TIGHTENING OF DOOR GLASS TO CARRIER PLATE** • Is it normal?	Yes	Go to the next step.
		No	After tightening correctly, reinspect. If the malfunction is not corrected, go to Step 3.
7	**INSPECT CONDITION OF GLASS RUN CHANNEL AND DOOR GLASS** • Is it normal?	Yes	Go to the next step.
		No	Assemble the glass run channel and door glass securely, and reinspect. If the malfunction is not corrected, go to Step 3.
8	**INSPECT DOOR GLASS CLOSING SPEED** • Does the door glass hesitate at any location?	Yes	Repeat the inspection from Step 3.
		No	Troubleshooting completed.



am3zzw0000211

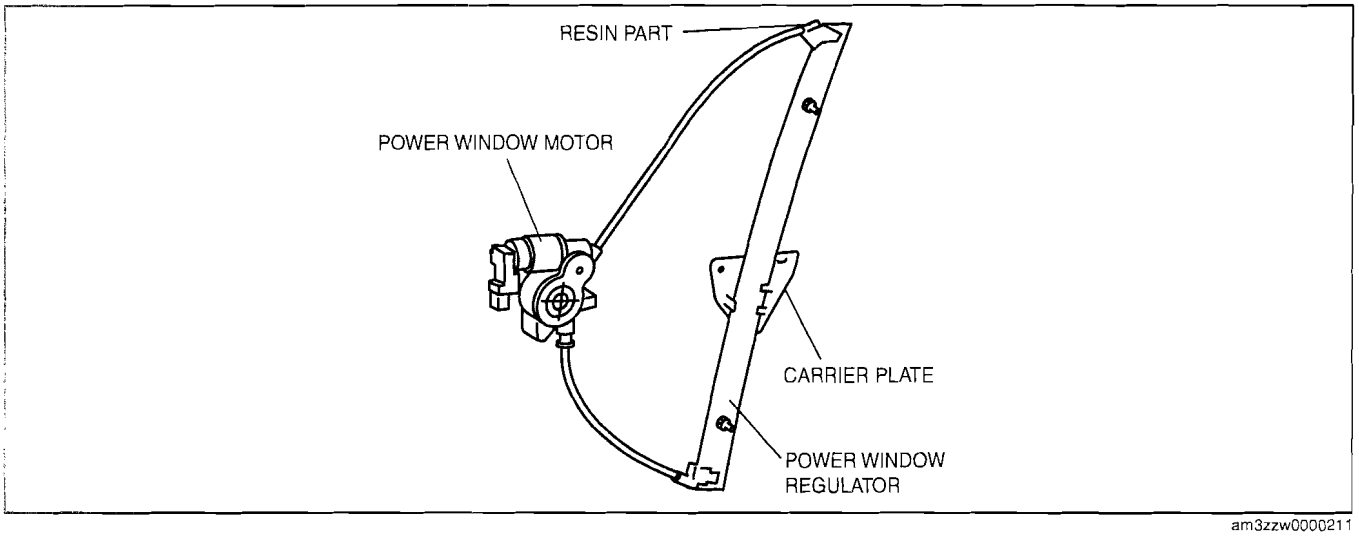
No.7 ABNORMAL NOISE WHILE THE DOOR GLASS IS OPENIGN OR CLOSING[POWER WINDOW SYSTEM]

id0903a0831600

7	Abnormal noise while the door glass is opening or closing
POSSIBLE CAUSE	• Installation screw is loose between the door glass and carrier plate. • Deformity in the power window regulator plastic part due to use. — Scratching, wear marks to the power window regulator resin part due to twisting of the cable. — Gear deformity in the power window motor. **Note** • Identify the location of the noise using a stethoscope or similar device.

Diagnostic procedure

Noise type	Time of occurrence	Possible cause	Location of noise	Action
Clanking noise	Door glass begins to move	Insufficiently tightened installation screw between the door glass and carrier plate.	Between door glass lower edge and carrier plate.	Securely tighten the installation screw.
Groaning noise (Sound increases due to use)	While door glass is operating	Vibration caused by wear on the resin part from cable twisting due to use of the power window regulator. **Note** • Noise does not occur if a roller is equipped to power window regulator resin part.	Power window regulator	Replace the power window regulator (See 09-12-8 FRONT POWER WINDOW REGULATOR REMOVAL/ INSTALLATION.) (See 09-12-10 REAR POWER WINDOW REGULATOR REMOVAL/ INSTALLATION.)
Whining noise Clicking noise (Periodic noise)		Gear inside power window motor is deformed due to use.	Gear in power window motor	Replace the power window motor (See 09-12-12 POWER WINDOW MOTOR REMOVAL/ INSTALLATION.)

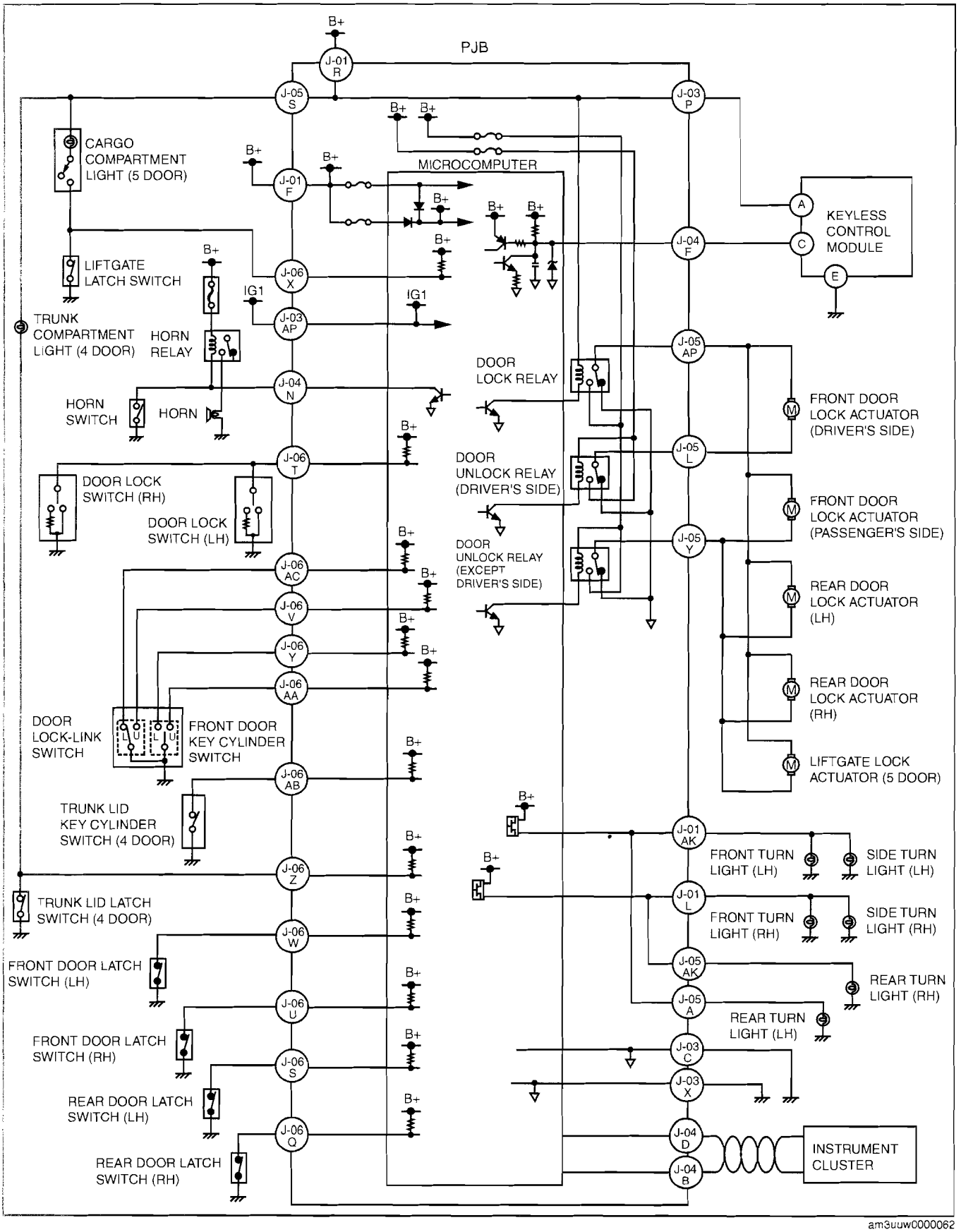


am3zzw0000211

09-03B SYMPTOM TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

KEYLESS ENTRY SYSTEM WIRING DIAGRAM[KEYLESS ENTRY SYSTEM]

id0903d2800900



am3uuw0000062

SYMPTOM TROUBLESHOOTING CHART[KEYLESS ENTRY SYSTEM]

id0903d2805600

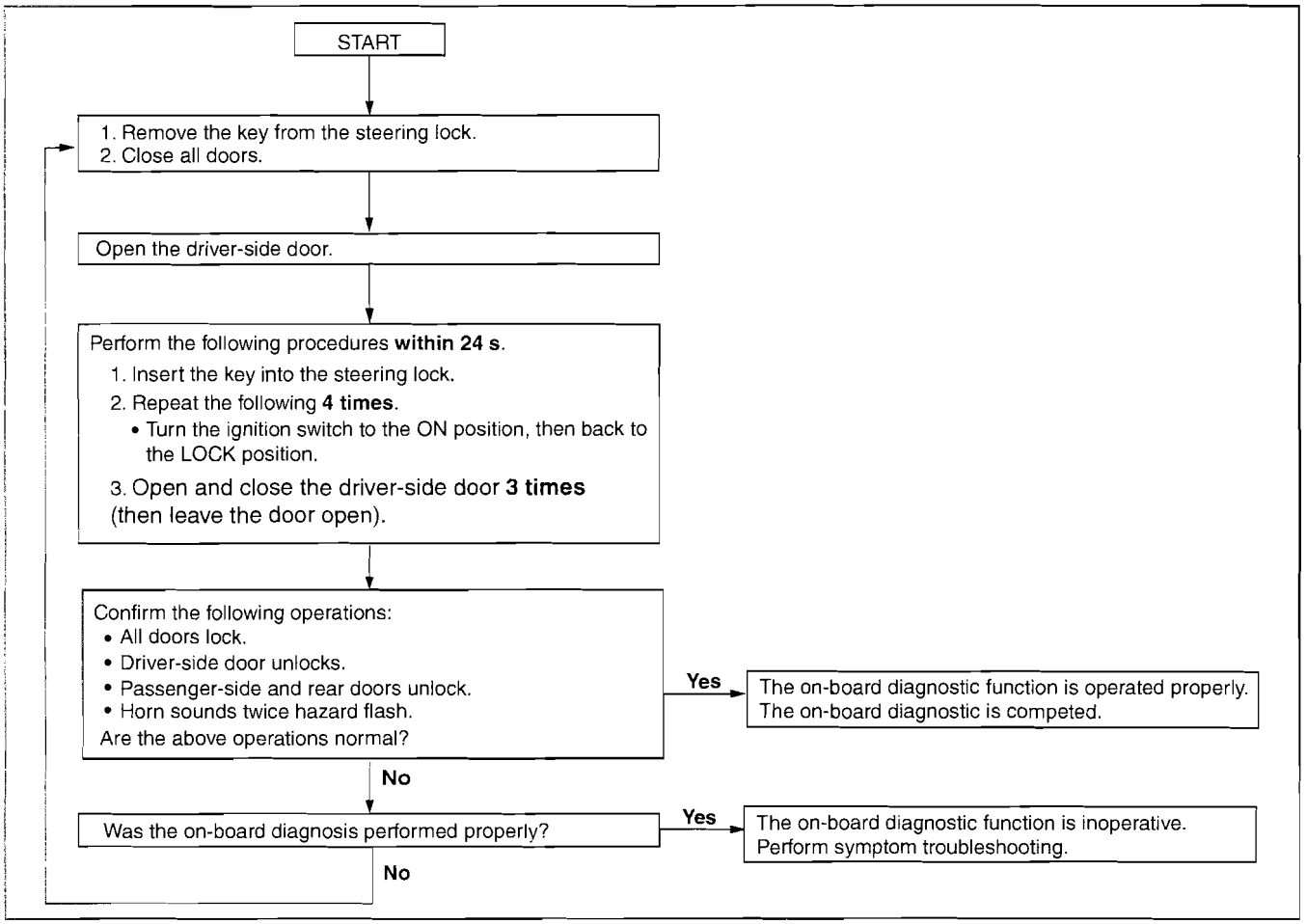
No.	Troubleshooting item	Description
1	One or more on-board diagnostic functions inoperative	• Malfunction in door lock linkage system
2	All on-board diagnostic functions inoperative	• Malfunction in PJB power supply circuit, door latch switch circuit, PJB ground circuit, or keyless control module.
3	Transmitter ID code cannot be reprogrammed	• Malfunction in transmitter battery, transmitter, PJB circuit, or keyless control module circuit.

KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS[KEYLESS ENTRY SYSTEM]

id0903d2800400

Note

- "All doors" includes the liftgate. (5 door)



c3u0903wt00

09-03B

KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION[KEYLESS ENTRY SYSTEM]

id0903d2800300

- Perform the following preliminary inspection before troubleshooting.

STEP	INSPECTION		ACTION
1	• Is an after-market system installed?	Yes	Perform troubleshooting according to the after-market keyless entry system manual.
		No	Go to the next step.
2	• Did the customer activate the keyless entry system with the key inserted into the steering lock?	Yes	• Explain to the customer that the system does not work with the key inserted into the steering lock. • Go to the next step.
		No	Go to the next step.
3	• Did the customer use the keyless entry system in particular area, such as being near TV towers, power plants, power lines, or factories?	Yes	Attempt to lock/unlock the doors with the transmitter in a non-interference area. **If system operates:** • Area of operation is suspect. Explain effect of outside interference on the transmitter to the customer. **If system does not operate:** • Go to the next step.
		No	Go to the next step.
4	• Are any of the following after-market electrical parts on the vehicle? — Cellular phone — Radio-wave equipment — Remote engine starter — TV — Other	Yes	Disconnect the after-market electrical part connectors and attempt to lock/unlock the doors with the transmitter. **If system operates:** • The after-market electrical parts are interfering with the keyless entry system. **If system does not operate:** • Go to the next step.
		No	Go to the next step.
5	• Perform the on-board diagnostic function. (See 09-03B-3 KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS[KEYLESS ENTRY SYSTEM].) • Does the on-board diagnostic function work?	Yes	Go to the next step.
		No	• Go to Step 1 of troubleshooting NO. 1. (See 09-03B-5 NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE[KEYLESS ENTRY SYSTEM].) • Go to Step 1 of troubleshooting NO. 2. (See 09-03B-7 NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE[KEYLESS ENTRY SYSTEM].)
6	• Attempt to reprogram the transmitter ID code. • Can the transmitter ID code be reprogrammed?	Yes	The system is normal.
		No	Go to Step 1 of troubleshooting NO. 3. (See 09-03B-10 NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED[KEYLESS ENTRY SYSTEM].)

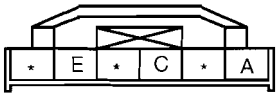
NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE[KEYLESS ENTRY SYSTEM]

id0903d2800600

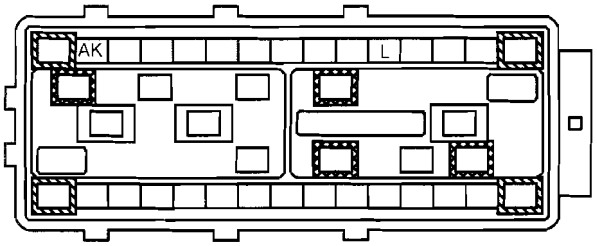
- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harnesses are connected correctly and undamaged.

1	**One or more on-board diagnostic functions inoperative**
DESCRIPTION	• Malfunction in door lock linkage system
POSSIBLE CAUSE	• Malfunction in door lock linkage • Malfunction in PJB door lock/unlock signal circuit — PJB malfunction

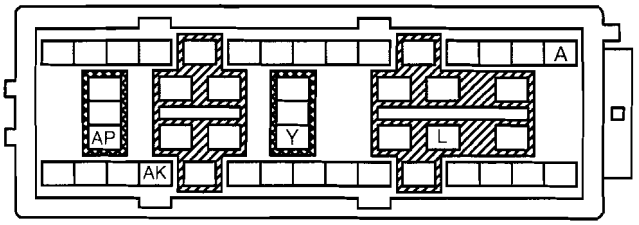
KEYLESS CONTROL MODULE
WIRING HARNESS-SIDE CONNECTOR



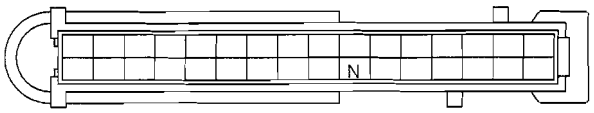
PJB (J-01)
WIRING HARNESS-SIDE CONNECTOR

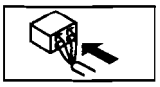


PJB (J-05)
WIRING HARNESS-SIDE CONNECTOR



PJB (J-04)
WIRING HARNESS-SIDE CONNECTOR





09-03B

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK HORN, AND HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS** • Did all of the following items work during on-board diagnostic function operation? — Hazard warning lights flashed — Horns sounded intermittently	Yes	Go to Step 8.
		No	Go to next step.
2	**INSPECT HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS** • Did hazard warning lights flash during on-board diagnostic function operation?	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT HAZARD WARNING LIGHT CIRCUIT** • Do hazard warning lights flash when hazard warning switch is on?	Yes	Go to next step.
		No	Inspect hazard warning light circuit.
*4	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (BETWEEN PJB AND TURN LIGHTS) OR PJB** • Measure the voltage at PJB terminals J-01 AK, J-01 L, J-05 AK and J-05 A during on-board diagnostic function operation. — When hazard warning light flashed: **Alternates between B+ and below 1.0 V** • Are the voltage as above?	Yes	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No	• Inspect wiring harness between PJB and turn lights. — If wiring harness is normal, replace the PJB, then go to Step 11. — If wiring harness malfunction, repair wiring harness, then go to Step 11.
5	**INSPECT HORN OPERATION DURING ON-BOARD DIAGNOSIS** • Did horns sound intermittently during on-board diagnostic function operation?	Yes	Go to Step 8.
		No	Go to next step.
6	**INSPECT HORN CIRCUIT** • Do horns sound when depressing horn switch on vehicle?	Yes	Go to next step.
		No	Inspect horn circuit.
*7	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN PJB AND HORN RELAY) OR PJB** • Turn ignition switch to LOCK position. • Disconnect the PJB connector and horn relay connector. • Is there continuity between PJB J-04 N and horn relay connector?	Yes	Replace PJB, then go to Step 11.
		No	Repair wiring harness between PJB and horn relay, then go to Step 11.
8	**VERIFY THAT ALL DOORS LOCK AND UNLOCK DURING ON-BOARD DIAGNOSIS** • Do all doors unlock and lock during on-board diagnostic function operation?	Yes	Reinspect the malfunction symptoms, then repeat from Step 1 if the malfunction recurs.
		No	Go to the next step.
9	**INSPECT DOOR LOCK LINKAGE** • Operate the door lock knob and verify the door locks and unlocks manually. • Does every door lock system work?	Yes	Go to the next step.
		No	Inspect the door lock linkage.
*10	**INSPECT IF MALFUNCTION IS IN DOOR LOCK ACTUATOR, PJB GROUND CIRCUIT OR ELSEWHERE** • Measure the voltage at PJB terminals J-05 AP, and J-05 Y. — All doors locked: **1.0 V or less → B+ → 1.0 V or less** (terminal J-05 AP) — Driver-side door unlocked: **1.0 V or less → B+ → 1.0 V or less** (terminal J-05 L) — All doors door unlocked: **B+**→1.0 V or less→**B+** (terminal J-05 Y) • Is the voltage as above?	Yes	Reinspect the malfunction symptoms, then repeat from Step 1 if the malfunction recurs.
		No	• Inspect the PJB connector. • Inspect the wiring harness between the PJB and door lock actuator. — If the above parts are normal, go to the next step. — If any of above parts are malfunctioning, repair the malfunctioning part.
11	**REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR** • Does the keyless entry system operate properly?	Yes	• Troubleshooting completed. • Explain repairs to the customer.
		No	Reinspect the malfunction symptoms, then repeat from Step 1 if malfunction recurs.

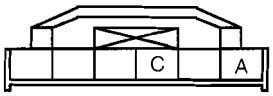
NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE[KEYLESS ENTRY SYSTEM]

id0903d2800700

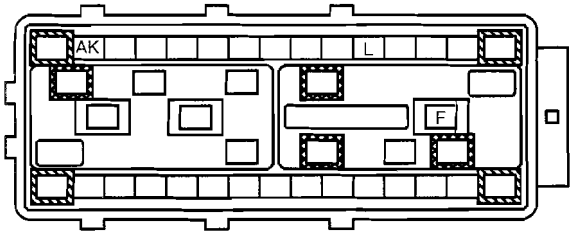
- When performing an asterisked (*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harnesses are connected correctly and undamaged.

2	**All on-board diagnostic functions inoperative**
DESCRIPTION	• Malfunction in PJB power supply circuit, door latch switch circuit, PJB ground circuit, or keyless control module.
POSSIBLE CAUSE	• Malfunction in IG1 or power supply signal circuit of PJB — PJB power supply fuse malfunction — Malfunction in wiring harness between PJB power supply fuses and PJB • Malfunction in door open/closed signal circuit of PJB — Door latch switch system malfunction — PJB malfunction — Malfunction in wiring harness between PJB and door latch switch • Malfunction in PJB GND signal circuit — Malfunction in wiring harness between PJB and ground • Malfunction in keyless control module — Keyless control module malfunction — Malfunction in wiring harness between keyless control module and PJB

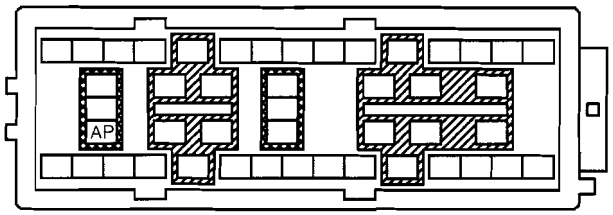
KEYLESS CONTROL MODULE
WIRING HARNESS-SIDE CONNECTOR



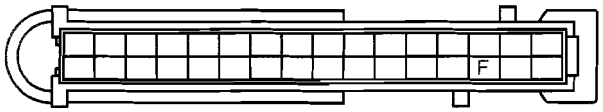
PJB (J-01)
WIRING HARNESS-SIDE CONNECTOR



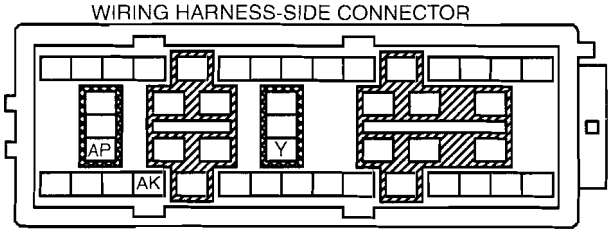
PJB (J-03)
WIRING HARNESS-SIDE CONNECTOR



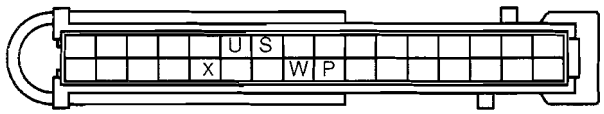
PJB (J-04)
WIRING HARNESS-SIDE CONNECTOR

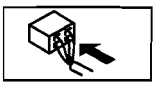


PJB (J-05)
WIRING HARNESS-SIDE CONNECTOR



PJB (J-06)
WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PJB POWER SUPPLY FUSES** • Are the PJB power supply fuses normal?	Yes	Go to the next step.
		No	Install an appropriate amperage fuse.
*2	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND PJB) OR ELSEWHERE** • Turn the ignition switch to the ON position. • Measure the voltage at the following PJB terminals: — IG1 signal (terminal J-03 AP) — Power supply signal (terminal J-01 F) • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and PJB, then go to Step 11.
*3	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (SHORT TO POWER SUPPLY BETWEEN FUSE BLOCK AND PJB, OR BETWEEN PJB AND GROUND) OR ELSEWHERE** • Turn the ignition switch to the LOCK position. • Disconnect the PJB connector. • Measure the voltage at the following PJB terminal (wiring harness-side): — IG1 signal (terminal J-03 AP) • Is the voltage **B+**?	Yes	Repair the malfunctioning wiring harness, then go to Step 11.
		No	Go to the next step.
*4	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN PJB AND GROUND) OR ELSEWHERE** • Is there continuity between PJB terminal J-03 C, J-03 X and ground?	Yes	Go to the next step.
		No	Repair the wiring harness between the PJB and ground, then go to Step 11.
5	**INSPECT PJB OR WIRING HARNESS (BETWEEN PJB AND DOOR LATCH SWITCHES FOR CONTINUITY)** • Is there continuity between PJB terminals J-06 P, J-06 S, J-06 U, J-06 W, J-06 X and ground?	Yes	Go to the next step.
		No	Repair the wiring harness between the PJB and door latch switches, then go to Step 11.
6	**INSPECT LATCH SWITCHES** • Inspect the door latch switches. • Are there normal?	Yes	Replace the PJB, then go to the next step.
		No	Repair latch switch system, then go to the next step.
7	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND KEYLESS CONTROL MODULE) OR ELSEWHERE** • Turn the ignition switch to the ON position. • Measure the voltage at the following keyless control module terminal: — Power supply signal (terminal A) • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and keyless control module, then go to Step 11.
8	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND GROUND) OR ELSEWHERE** • Is there continuity between keyless control module terminal E and ground?	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless control module and ground, then go to Step 11.
9	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND PJB) OR ELSEWHERE** • Turn the ignition switch to the ON position. • Disconnect the keyless control module connector and PJB connector. • Is there continuity between the following terminals? — J-04 F (PJB connector)—C (keyless control module connector)	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless control module and PJB, then go to Step 11.

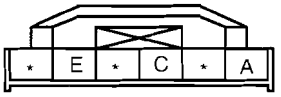
STEP	INSPECTION		ACTION
10	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND PJB) OR PJB** • Measure the voltage at keyless control module terminal C. — When transmitter operated: • Any transmitter button is operated **0.5 V** • Any transmitter button is not operated: **3.5 V** • Is the voltage normal?	Yes	Replace the PJB, then go to the next step.
		No	Replace the keyless control module, then go to the next step.
11	**REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR** • Does the keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to the customer.
		No	Reinspect the malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED[KEYLESS ENTRY SYSTEM]

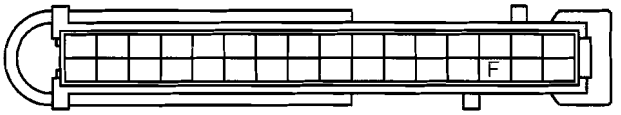
id0903d2800800

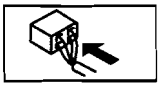
3	Transmitter ID code cannot be reprogrammed
DESCRIPTION	• Malfunction in transmitter battery, transmitter, PJB circuit, or keyless control module circuit.
POSSIBLE CAUSE	• Malfunction in transmitter battery, transmitter, PJB, or keyless control module.

KEYLESS CONTROL MODULE
WIRING HARNESS-SIDE CONNECTOR



PJB (J-04)
WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT TRANSMITTER BATTERY INSTALLATION AND TYPE** • Visually inspect the transmitter battery. • Are the below items correct? — Transmitter battery installation (correct polarity) — Battery type (CR2025)	Yes	Go to the next step.
		No	Install the transmitter battery properly or replace with the specified transmitter battery (CR2025), then go to Step 11.
2	**INSPECT TRANSMITTER BATTERY TERMINALS FOR RUST AND POOR CONNECTION** • Visually inspect the transmitter. — Is there rust on the transmitter battery terminals (positive or negative)? — Is there poor connection between the terminals and battery?	Yes	Replace the transmitter battery or repair the transmitter battery terminal, then go to Step 11.
		No	Go to the next step.
3	**INSPECT TRANSMITTER BATTERY** • Inspect the transmitter battery. • Is the battery voltage normal?	Yes	Go to the next step.
		No	Replace the transmitter battery, then go to Step 11.
4	**INSPECT IF MALFUNCTION IS IN TRANSMITTER BATTERY OR ELSEWHERE** • Replace with a transmitter battery known to be good. • Does the keyless entry system operate properly?	Yes	Replace the transmitter battery, then go to Step 11.
		No	Go to the next step.
5	**INSPECT IF MALFUNCTION IS IN TRANSMITTER OR PJB** • Reprogram the transmitter ID code using another known good transmitter. • Does the keyless entry system operate properly?	Yes	Replace the transmitter and reprogram the transmitter ID code, then go to Step 11.
		No	Go to the next step.
6	**INSPECT POWER SUPPLY FUSE** • Is the keyless control module power supply fuse normal?	Yes	Go to the next step.
		No	Install an appropriate amperage fuse, then go to Step 11.
7	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND KEYLESS CONTROL MODULE) OR ELSEWHERE** • Measure the voltage at the following keyless control module terminal: — Power supply signal (terminal A) • Is the voltage **B+**?	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and keyless control module, then go to Step 11.

STEP	INSPECTION		ACTION
8	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND GROUND) OR ELSEWHERE** • Is there continuity between keyless control module terminal E and ground?	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless control module and ground, then go to Step 11.
9	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND PJB) OR ELSEWHERE** • Disconnect the keyless control module connector and PJB connector. • Is there continuity between the following terminals? — J-04-F (PJB connector)—C (keyless control module connector)	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless control module and PJB, then go to Step 11.
10	**INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND PJB) OR PJB** • Measure the voltage at keyless control module terminal C. — When transmitter operated: • Any transmitter button is operated: **0.5 V** • Any transmitter button is not operated: **3.5 V** • Is the voltage normal?	Yes	Replace the PJB, then go to the next step.
		No	Replace the keyless control module, then go to the next step.
11	**REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR** • Does the keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to the customer.
		No	Reinspect the malfunction symptoms, then repeat from Step 1 if the malfunction recurs.

09-03C SYMPTOM TROUBLESHOOTING [INSTRUMENT CLUSTER]

SYMPTOM TROUBLESHOOTING[INSTRUMENT CLUSTER]

id0903d5807200

No.	TROUBLESHOOTING ITEM	PAGE
1	Fuel gauge needle position incorrect	(See 09-03C-3 NO. 1 FUEL GAUGE NEEDLE POSITION INCORRECT[INSTRUMENT CLUSTER].)
2	All meters and gauges do not operate	(See 09-03C-4 NO. 2 ALL METERS AND GAUGES DO NOT OPERATE[INSTRUMENT CLUSTER].)
3	ABS warning light illuminates	(See 09-03C-5 NO. 3 ABS WARNING LIGHT ILLUMINATES[INSTRUMENT CLUSTER].)
4	MIL illuminates	(See 09-03C-6 NO. 4 MIL ILLUMINATES[INSTRUMENT CLUSTER].)
5	Brake system warning light illuminates	(See 09-03C-7 NO. 5 BRAKE SYSTEM WARNING LIGHT ILLUMINATES[INSTRUMENT CLUSTER].)
6	Instrument cluster illumination does not illuminate	(See 09-03C-8 NO. 6 INSTRUMENT CLUSTER ILLUMINATION DOES NOT ILLUMINATE[INSTRUMENT CLUSTER].)

QUICK DIAGNOSTIC CHART[INSTRUMENT CLUSTER]

id0903d5807300

X: Applicable

No.	Troubleshooting item / Possible factor	Poor connection of fuel gauge sender unit connector, terminal damage	Poor connection of instrument cluster connector, terminal damage	Fuel gauge sender unit	Instrument cluster	Fuel gauge sender unit is improperly installed	Open or short circuit in wiring harness between instrument cluster and GND	Open or short circuit in wiring harness between instrument cluster and fuel gauge sender unit	Fuse malfunction (METER)	Open or short circuit in power supply (IG1) wiring harness	Open or short circuit in GND wiring harness	Poor connection of ABS/TCS HU/CM connector, terminal damage	ABS/TCS HU/CM	Short circuit in wiring harness between CAN-L, CAN-H and GND	Open circuit in CAN wiring harness (CAN-L, CAN-H)	CAN wiring harness (CAN-L, CAN-H) short each other	Poor connection of PCM connector, terminal damage	PCM	Poor connection of BCM connector, terminal damage	BCM	Poor connection of brake fluid level sensor connector, terminal	Brake fluid level sensor	Poor connection of Parking brake switch connector, terminal damage	Parking brake switch	Fuse malfunction (ROOM ILLUMI)
1	The indicator position of the fuel gauge is not correct	X	X	X	X	X	X	X											X	X					
2	Neither the entire meter nor gauges operate		X		X				X	X	X														
3	ABS warning light illuminates		X		X							X	X	X	X	X									
4	MIL illuminates		X		X									X	X	X	X	X							
5	Brake system warning light illuminates		X		X							X	X	X	X	X					X	X	X	X	
6	Instrument cluster illumination does not illuminate		X		X																				X

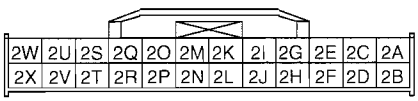
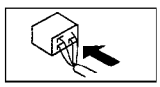
e6u903ew5o01

NO. 1 FUEL GAUGE NEEDLE POSITION INCORRECT[INSTRUMENT CLUSTER]

id0903d5807400

1	Fuel gauge needle position incorrect
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • BCM malfunction • Connector or pin malfunction • Fuel gauge sender unit is improperly installed • Open or short circuit in wiring harness between instrument cluster and ground • Open or short circuit in wiring harness between instrument cluster and fuel gauge sender unit

Diagnostic procedure

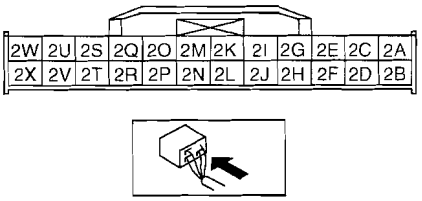
STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Verify that the fuel gauge needle does not move after ignition switch is turned off, or the display does not indicate F even though the fuel tank is full. • Is the fuel gauge normal?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Start the instrument cluster input/output check mode. • Select the check code 22. • Display value is **12—129**?	Yes	Go to the next step.
		No	Go to Step 4.
3	• Perform the check code 23 inspection. • Is there any malfunction?	Yes	Replace the instrument cluster.
		No	Go to the next step.
4	• Perform the check code 22 inspection. • Is there any malfunction?	Yes	Go to the next step.
		No	Go to Step 6.
5	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?  	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.
6	• Turn the ignition switch to the LOCK position. • Remove the instrument cluster. • Disconnect the instrument cluster connector. • Inspect for continuity between the following wiring harnesses. — 2M terminal—ground — 2D terminal—ground • Is there continuity?	Yes	Repair or replace the wiring harness between the instrument cluster and ground.
		No	Go to the next step.
7	• Turn the ignition switch off. • Inspect the fuel gauge sender unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	• Turn the ignition switch to the LOCK position. • Inspect for continuity between the following wiring harnesses the instrument cluster and fuel gauge sender unit. — 2M terminal—C terminal — 2D terminal—A terminal • Is there continuity?	Yes	Go to the next step.
		No	Inspect the BCM and BCM terminals. • If there is a malfunction, replace the BCM. • If there is no malfunction, repair or replace the wiring harness between the instrument cluster and the fuel gauge sender unit.
9	• Turn the ignition switch off. • Is the fuel gauge sender unit installed properly?	Yes	Inspect the fuel gauge sender unit.
		No	Reinstall the fuel gauge sender unit.

NO. 2 ALL METERS AND GAUGES DO NOT OPERATE[INSTRUMENT CLUSTER]

id0903d5807500

2	All meters and gauges do not operate
POSSIBLE CAUSE	• Instrument cluster malfunction • Connector or pin malfunction • Fuse malfunction • Open or short circuit in power supply (IG1) wiring harness • Open or short circuit in ground wiring harness

Diagnostic procedure

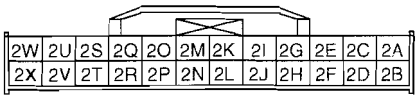
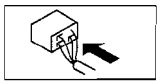
STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Inspect the following: — Does the odometer/tripmeter illuminate? — Does the fuel gauge operate? — Dose the MIL illumination turn off within **approx. 3 s**?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Inspect the METER fuse. • Is the fuse normal?	Yes	Go to the next step.
		No	Replace the fuse. • If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.
3	• Turn the ignition switch to LOCK position. • Remove the instrument cluster. • Disconnect the instrument cluster connector. • Inspect the voltage between instrument cluster wiring harness-side connector terminal 2F and terminal 2V. • Turn the ignition switch to the ON position. • Is the voltage B+?  	Yes	Go to the next step.
		No	Inspect the suspected wiring harness, then repair or replace.
4	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

NO. 3 ABS WARNING LIGHT ILLUMINATES[INSTRUMENT CLUSTER]

id0903d5807600

3	ABS warning light illuminates
POSSIBLE CAUSE	• ABS/TCS HU/CM malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

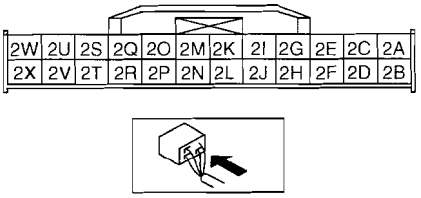
STEP	INSPECTION		ACTION
1	• Start the engine. • Does the ABS warning light turn off?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Are there a number of warning lights illuminated?	Yes	Go to Step 4.
		No	Go to the next step.
3	• Start the instrument cluster input/output check mode. • Does the ABS warning light turn off with a check code other than 26?	Yes	Inspect the ABS/TCS HU/CM.
		No	Replace the instrument cluster.
4	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms**?	Yes	Go to the next step.
		No	Go to Step 6.
5	• Inspect DLC-2 terminals F and E for a short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
6	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?  	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

NO. 4 MIL ILLUMINATES[INSTRUMENT CLUSTER]

id0903d5807700

4	MIL illuminates
POSSIBLE CAUSE	• PCM malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

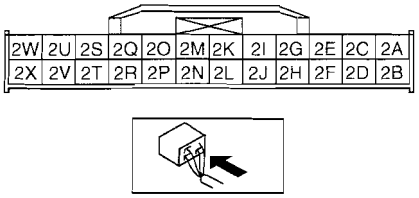
STEP	INSPECTION		ACTION
1	• Start the engine. • Does the MIL turn off?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Are there a number of warning lights illuminated?	Yes	Go to Step 4.
		No	Go to the next step.
3	• Start the instrument cluster input/output check mode. • Does the MIL turn off with a check code other than 26?	Yes	Inspect the PCM.
		No	Replace the instrument cluster.
4	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms**?	Yes	Go to the next step.
		No	Go to Step 6.
5	• Inspect DLC-2 terminals F and E for short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
6	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal? 	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

NO. 5 BRAKE SYSTEM WARNING LIGHT ILLUMINATES[INSTRUMENT CLUSTER]

id0903d5807800

5	Brake system warning light illuminates
POSSIBLE CAUSE	• ABS/TCS HU/CM malfunction • Brake fluid level sensor malfunction • Parking brake switch malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

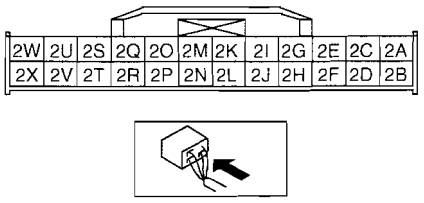
STEP	INSPECTION		ACTION
1	• Start the engine. • release the parking brake. • Does the brake system warning light turn off?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Are there a number of warning lights illuminated?	Yes	Go to Step 5.
		No	Go to the next step.
3	• Does the brake fluid need replenishment?	Yes	Add brake fluid.
		No	Go to the next step.
4	• Start the instrument cluster input/output check mode. • Does the brake system warning light turn off with a check code other than 26?	Yes	Inspect the ABS/TCS HU/CM, brake fluid level sensor, parking brake switch or connectors.
		No	Replace the instrument cluster.
5	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms**?	Yes	Go to the next step.
		No	Go to Step 7.
6	• Inspect DLC-2 terminals F and E for short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
7	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal? 	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

NO. 6 INSTRUMENT CLUSTER ILLUMINATION DOES NOT ILLUMINATE[INSTRUMENT CLUSTER]

id0903d5807900

6	Instrument cluster illumination does not illuminate
POSSIBLE CAUSE	• Instrument cluster malfunction • Connector or pin malfunction • Fuse malfunction

Diagnostic procedure

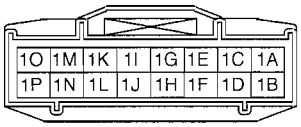
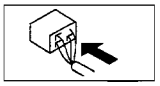
STEP	INSPECTION		ACTION
1	• Turn the light switch to the TNS position. • Does the instrument cluster illumination turn on?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Does the non-illumination include the entire instrument cluster?	Yes	Go to the next step.
		No	Replace the instrument cluster.
3	• Inspect the ROOM and ILLUMI fuse. • Are the fuses normal?	Yes	Go to the next step.
		No	Replace the fuse. • If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.
4	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?  	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

NO. 7 SPEEDOMETER INDICATION IS DEFECTIVE[INSTRUMENT CLUSTER]

id0903d5808000

7	Speedometer indication is defective
POSSIBLE CAUSE	• ABS HU/CM or DSC HU/CM malfunction • PCM malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

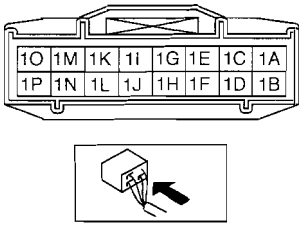
STEP	INSPECTION		ACTION
1	• Start the engine, and drive the vehicle. — Does the speedometer needle move smoothly? — Does the speedometer needle indicate correct speed?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Do the tachometer and the water temperature gauge operate normally?	Yes	Go to Step 5.
		No	Go to the next step.
3	• Inspect the DTC for the instrument cluster ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 09-02C-2 DTC TABLE[INSTRUMENT CLUSTER].)
		No	Go to the next step.
4	• Inspect the DTC for the PCM and ABS HU/CM or DSC HU/CM ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 01-02A-22 DTC TABLE[LF, L3].) (See 01-02B-14 DTC TABLE[L3 WITH TC].) (See 04-02A-2 ON-BOARD DIAGNOSIS[ABS].) (See 04-02B-2 ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].)
		No	Go to the next step.
5	• Start the instrument cluster input/output check mode. • Inspect the speedometer using the check code 12. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is the speedometer normal?	Yes	Go to the next step.
		No	Replace the instrument cluster.
6	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms**?	Yes	Go to the next step.
		No	Go to Step 8.
7	• Disconnect the negative battery cable. • Inspect DLC-2 terminals F and E for short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
8	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminal.
9	• Disconnect the negative battery cable. • Measure the resistance between instrument cluster connector terminals 1I and 1K. • Is the resistance **114—126 ohms?**  	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.

NO. 8 TACHOMETER INDICATION IS DEFECTIVE[INSTRUMENT CLUSTER]

id0903d5808100

8	Tachometer indication is defective
POSSIBLE CAUSE	• PCM malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

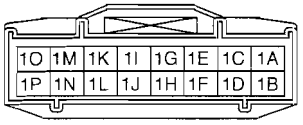
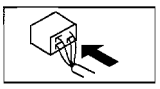
STEP	INSPECTION		ACTION
1	• Start the engine. — Does the tachometer needle move smoothly? — Does the tachometer needle indicate the correct engine speed?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Do the speedometer and the water temperature gauges operate normally?	Yes	Go to Step 5.
		No	Go to the next step.
3	• Inspect the DTC for the instrument cluster ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 09-02C-2 DTC TABLE[INSTRUMENT CLUSTER].)
		No	Go to the next step.
4	• Inspect the DTC for the PCM ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 01-02A-22 DTC TABLE[LF, L3].) (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
5	• Start the instrument cluster input/output check mode. • Inspect the tachometer using the check code 13. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Is the tachometer normal?	Yes	Go to the next step.
		No	Replace the instrument cluster.
6	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms?**	Yes	Go to the next step.
		No	Go to Step 8.
7	• Disconnect the negative battery cable. • Inspect DLC-2 terminals F and E for short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
8	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminal.
9	• Disconnect the negative battery cable. • Measure the resistance between instrument cluster connector terminals 1I and 1K. • Is the resistance **114—126 ohms?** 	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.

NO. 9 WATER TEMPERATURE GAUGE INDICATION IS DEFECTIVE[INSTRUMENT CLUSTER]

id0903d5808200

9	Water temperature gauge indication is defective
POSSIBLE CAUSE	• PCM malfunction • Instrument cluster malfunction • Connector or pin malfunction • Short circuit in wiring harness between CAN-L, CAN-H and ground • Open circuit in CAN wiring harness (CAN-L, CAN-H) • CAN wiring harness (CAN-L, CAN-H) short to each other

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Start the engine. • Does the water temperature gauge needle move to medium range gradually and stay there?	Yes	Troubleshooting completed.
		No	Go to the next step.
2	• Do the speedometer and the tachometer operate normally?	Yes	Go to Step 5.
		No	Go to the next step.
3	• Inspect the DTC for the instrument cluster ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 09-02C-2 DTC TABLE[INSTRUMENT CLUSTER].)
		No	Go to the next step.
4	• Inspect the DTC for the PCM ON-BOARD DIAGNOSTIC SYSTEM. • Has a DTC been recorded in memory?	Yes	Go to the applicable DTC troubleshooting procedure. (See 01-02A-22 DTC TABLE[LF, L3].) (See 01-02B-14 DTC TABLE[L3 WITH TC].)
		No	Go to the next step.
5	• Start the instrument cluster input/output check mode. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.) • Inspect the water temperature gauge using check code 25. • Is the water temperature gauge normal?	Yes	Go to the next step.
		No	Replace the instrument cluster.
6	• Disconnect the negative battery cable. • Measure the resistance between DLC-2 terminals F and E. • Is the resistance **54—66 ohms?**	Yes	Go to the next step.
		No	Go to Step 8.
7	• Disconnect the negative battery cable. • Inspect DLC-2 terminals F and E for short to power supply or ground. • Is there any malfunction?	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
8	• Turn the ignition switch off. • Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion). • Are the terminals normal?	Yes	Go to the next step.
		No	Repair or replace the terminal.
9	• Disconnect the negative battery cable. • Measure the resistance between instrument cluster connector terminals 1I and 1K. • Is the resistance **114—126 ohms?**  	Yes	Inspect the wiring harness and CAN system-related module. Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.

09-03D SYMPTOM TROUBLESHOOTING [ENTIRE AUDIO SYSTEM]

FOREWORD[ENTIRE AUDIO SYSTEM]

id0903e2801000

Note

- Note down all radio programs set by the customer prior to the repairs. Reset all radio programs and adjust the time after the repairs.

Troubleshooting Index

No.	Symptom	Possible DTC
1	AF noise or POP noise at all sources (Radio, CD)	09:Er20, 09:Er21
2	No power to the entire audio system	09:Er20
3	No sound from all the speakers	03:Er07, 03:Er10, 09:Er20, 09:Er21
4	No sound from some speakers	—
5	Sound break-up or poor sound quality	09:Er21
6	Volume increases/decreases while driving the vehicle	—
7	ALC function is inoperative	—
8	No audio system illumination	09:Er20, 21:Er19

Quick Diagnostic Chart (Entire Audio System)

X: Applicable

Possible factor \ Troubleshooting item	1 AF noise or POP noise at all sources (Radio, CD)	2 No power to the entire audio system	3 No sound from all the speakers	4 No sound from some speakers	5 Sound break-up or poor sound quality	6 Volume increases/decreases while driving the vehicle	7 ALC function is inoperative	8 No audio system illumination
Low vehicle battery voltage	X							
Jammed radio signals from after market equipment	X							
Speaker malfunction (e. g., foreign material penetration, damage)	X		X	X	X			
Improper speaker installation	X				X			
Poor connection of audio unit connector, terminal damage	X	X		X				X
Antenna malfunction (e.g., poor ground)	X							
Audio unit malfunction	X	X	X	X	X	X	X	X
Audio amplifier malfunction (with BOSE)	X		X	X	X	X		
Open or short circuit in wiring harness between audio amplifier and ground (with BOSE)	X							
Burnt fuse (B+)		X						
Burnt fuse (ACC)		X						
Open or short circuit in power supply (B+) wiring harness		X						
Open or short circuit in power supply (ACC) wiring harness		X						
Short circuit in wiring harness between audio unit and speaker (without BOSE)			X	X				
Open circuit in wiring harness between audio unit and speaker (without BOSE)				X				
Open or short circuit in wiring harness between audio amplifier and speaker (with BOSE)			X	X				
Open or short circuit in wiring harness between audio amplifier and audio unit (with BOSE)			X	X				
Poor connection of audio amplifer connector, terminal damage (with BOSE)	X		X	X				
Short circuit inside speaker			X	X				
Door trim and/or package trim vibration					X			
Open or short circuit in vehicle speed signal wiring harness (e.g., instrument cluster)							X	
Burnt fuse (TNS signal)								X
Open or short circuit in TNS signal wiring harness								X
Center panel malfunction								X

am3uuw0000016

CONFIRMATION STEP 1: AUDIO PANEL SWITCH CONFIRMATION[ENTIRE AUDIO SYSTEM]

id0903e2802800

- Verify the customer complaint and identify the malfunction as occurring from either the center panel or the audio unit.

How to activate audio panel switch confirmation mode

1. Turn the audio system on.
2. Press the POWER button and simultaneously pull up the CLOCK switch for **approx. 1 s.**
3. The audio panel switch confirmation mode is now activated.

STEP	INSPECTION		ACTION
1	• Press each button on the center panel. • Does the buzzer sound when a button is pressed?	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	Go to the next step.
2	• Disassemble and reassemble the center panel and audio unit. • Activate the audio panel switch confirmation mode. • Does the buzzer sound when a button is pressed?	Yes	Go to the next step.
		No	Replace the center panel. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.)
3	• Does the audio system operate properly?	Yes	The system is normal.
		No	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.

CONFIRMATION STEP 2: AUDIO CONTROL SWITCH CONFIRMATION[ENTIRE AUDIO SYSTEM]

id0903e2802900

- Verify the customer complaint and identify the malfunction as occuring from either the audio control switch or the audio unit.

09-03D

STEP	INSPECTION		ACTION
1	• Is the symptom related to either the audio control switch or the audio panel operation?	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	**The symptom is related to the audio panel operation:** • Follow "Confirmation Step 1". **The symptom is related to the audio control switch operation:** • Go to the next step.
2	• Disconnect the audio unit connector (24-pin). • Inspect both the audio unit and the wiring harness-side connectors for a poor connection. (such as damaged/pulled-out pins, corrosion). — Terminal N (ST SW1) — Terminal P (ST SW2) • Are all the pins normal?	Yes	Go to the next step.
		No	**If the audio unit side connector is malfunctioning:** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **If the wiring harness-side connector is malfunctioning:** • Repair or replace the pins and/or the connector.
3	• Inspect the continuity between audio unit wiring harness-side connector terminals N and P while operating the audio control switch. • Does the resistance change?	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	Go to the next step.
4	• Turn the ignition switch to the LOCK position. • Remove the audio control switch. • Inspect the continuity between the audio unit wiring harness-side connector (24-pin) terminal and the audio control switch wiring harness-side connector (8-pin) terminal. — Terminal N (24-pin) — Terminal C (8-pin) — Terminal P (24-pin) — Terminal D (8-pin) • Is there continuity?	Yes	Replace the audio control switch. (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/ INSTALLATION.)
		No	Repair or replace the related wiring harnesses.

NO.1 AF NOISE OR POP NOISE AT ALL SOURCES (RADIO, CD)[ENTIRE AUDIO SYSTEM]

id0903e2817600

1	AF noise or POP noise at all sources (Radio, CD)/Possible DTC: 09:Er20, 09:Er21

Troubleshooting hints

- Low vehicle battery voltage.
- Jammed radio signals from after market equipment.
- Speaker malfunction (e.g., foreign material penetration, damage)
- Improper speaker installation
- Audio unit malfunction
- Audio amplifier malfunction (with Bose)
- Poor connection of audio unit connector, terminal damage
- Poor connection of audio amplifier connector, terminal damage
- Antenna malfunction (e.g., poor ground)
- Open or short circuit in wiring harness between audio amplifier and ground (with Bose)

Note

- AF noise is a snapping noise that generally occurs during ON/OFF switching operations of electrical equipment other than the audio unit, or a continual rasping noise that occurs when electrical equipment is operated. This is caused by noise interference in the power supply wiring, signal wiring, speaker cable or head of cassette deck. Therefore noise can be heard regardless of radio wave conditions or the audio volume position. The noise will start after one click from the minimum position of the volume button but normally does not change even when volume is turned to a higher position.
- POP noise is snapping or popping noise that occurs during ON/OFF switching operation of the audio unit, or when switching from radio to CD. Even a normal audio unit sometimes emits a little noise depending on the conditions.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the vehicle battery voltage. • Is the vehicle battery voltage normal? **Specification:** **Ignition switch ON: 11.5 V or more** **Idle: 12.5 V or more**	Yes	Go to the next step.
		No	Charge the battery, then go to the next step.
2	• Turn the audio system on. • Is there any noise?	Yes	Go to the next step.
		No	The system is normal. Explain to the customer that the vehicle battery voltage was low.
3	• Are any of the following after-market equipment installed? (Inspect especially near the antenna.) — Radar detector — Remote engine starter — Anti-theft device — Other	Yes	Go to the next step.
		No	Go to the Step 5.
4	• Remove the after-market equipment. • Turn the audio system on. • Is there any noise?	Yes	Go to the next step.
		No	The system is normal. The after-market electrical devices might be the cause of the noise.
5	• Is there noise coming from all the speakers?	Yes	Go to the Step 7.
		No	Go to the next step.
6	• Inspect the suspect speaker. • Is the speaker normal?	Yes	Go to the next step.
		No	**If there is any foreign material adhering to the speaker:** • Remove the foreign material from the speaker. **If the speaker is malfunctioning:** • Replace the speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION.) (See 09-20-8 REAR DOOR SPEAKER REMOVAL/ INSTALLATION.) **If the speaker is not installed properly:** • Install the speaker properly.

STEP	INSPECTION		ACTION
7	• Attempt to duplicate the symptom on another vehicle. • Does the noise level improve compared to the customer's vehicle?	Yes	Go to the next step.
		No	The system is normal. Explain the noise generation mechanism to the customer. **Note** • The noise level that may be heard varies depending on the operating speed of the audio power and/or mode switches.
8	• Turn the ignition switch to the LOCK position. • Remove the audio unit (without Bose) or the audio amplifier (with Bose). • Inspect the connection of the audio unit connector (without Bose, 24-pin) or the audio amplifier connector (with Bose, 24-pin) (for sound signal line). • Is the connector connected securely?	Yes	Go to the next step.
		No	Repair or replace the terminal or connector. Go to the next step.
9	• Is there any noise?	Yes	Go to the next step.
		No	The system is normal.
10	• Inspect the ground condition of the manual antenna. • Is the ground condition normal?	Yes	Repair or replace the ground. Go to the next step.
		No	Go to the next step.
11	• Is there any noise?	Yes	**Without Bose** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **With Bose** • Replace the audio amplifier if any of the following occur: (See 09-20-7 AUDIO AMPLIFIER REMOVAL/ INSTALLATION.) — The noise occurs from a specific speaker. — Noise occurs when the volume is minimized. • Replace the audio unit if any of the following occur: (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) — The noise occurs from two or more speakers. — No noise occurs when the volume is minimized.
		No	The system is normal.

NO.2 NO POWER TO THE ENTIRE AUDIO SYSTEM[ENTIRE AUDIO SYSTEM]

id0903e2817800

2	No power to the entire audio system/Possible DTC: 09:Er20

Troubleshooting hints

- Poor connection of audio unit connector, terminal damage
- Audio unit malfunction
- Burnt fuse (B+)
- Burnt fuse (ACC)
- Open or short circuit in power supply (B+) wiring harness
- Open or short circuit in power supply (ACC) wiring harness

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the LOCK position. • Inspect the following fuses: — ACC — ROOM • Are the fuses normal?	Yes	Go to the next step.
		No	Replace with the appropriate standard fuse. • If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.
2	• Remove the audio unit. • Inspect the connection of the audio unit connector (24-pin). • Disconnect the audio unit connector and inspect both the audio unit and the wiring harness-side connectors for a poor connection. (such as damaged/pulled-out pins, corrosion). — Terminal 1B (B+) — Terminal 1R (ACC) — Terminal 1W (GND) • Are all the pins normal?	Yes	Go to the next step.
		No	**If audio unit connector has a poor connection:** • Securely connect the audio unit connector. **If the audio unit side connector is malfunctioning:** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **If the wiring harness-side connector is malfunctioning:** • Repair or replace the pins and/or the connector.
3	• Connect the audio unit connector. • Inspect the voltage for the power supply line (B+, ACC). **Specification:** **Ignition switch ON: 11.5 V or more** **Idle: 12.5 V or more** • Is the voltage normal?	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses.
4	• Turn the ignition switch to the LOCK position. • Remove the audio unit connector (24-pin). • Inspect the continuity between audio unit wiring harness-side connector terminal 1W and the ground. • Is there continuity?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Repair or replace the wiring harness.

NO.3 NO SOUND FROM ALL SPEAKERS[ENTIRE AUDIO SYSTEM]

id0903e2803200

Vehicles With Bose

3	No sound from all the speakers/Possible DTC: 03:Er07, 03:Er10, 09:Er20, 09:Er21

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio amplifier malfunction
- Open or short circuit in wiring harness between audio amplifier and speaker
- Open or short circuit in wiring harness between audio amplifier and audio unit.
- Short circuit inside speaker

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Press the AUDIO CONT button for **2 s or more**. • Play the CD or radio. • Adjust the volume between "10" and "15". • Is there sound?	Yes	The system is normal.
		No	Go to the next step.
2	• Measure the voltage at audio amplifier terminal A (8-pin). (vehicle wiring harness-side) • Is the voltage B+?	Yes	Go to Step 4.
		No	Repair or replace the wiring harness between the audio amplifier and fuse. Go to the next step.
3	• Is there any sound?	Yes	The system is normal.
		No	Go to the next step.
4	• Turn the ignition switch to the LOCK position. • Disconnect the audio amplifier connector (8-pin, 24-pin). • Inspect the continuity between the following terminals of the audio amplifier connector and the speaker connector: **For front speaker (LH)** — Terminal 1Q — Terminal B — Terminal 1S — Terminal A **For front speaker (RH)** — Terminal 1U — Terminal B — Terminal 1W — Terminal A **For tweeter (LH)** — Terminal 1Q — Terminal B — Terminal 1S — Terminal A **For tweeter (RH)** — Terminal 1U — Terminal B — Terminal 1W — Terminal A **For rear speaker (LH)** — Terminal 1I — Terminal B — Terminal 1K — Terminal A **For rear speaker (RH)** — Terminal 1M — Terminal B — Terminal 1O — Terminal A **For woofer** — Terminal 2D — Terminal B — Terminal 2C — Terminal A • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses.

STEP	INSPECTION		ACTION
5	• Turn the ignition switch to the LOCK position. • Disconnect the audio amplifier connector (8-pin, 24-pin). • Inspect the continuity between the audio amplifier connector and ground: **For front speakers and tweeters** — Terminal 1Q (24-pin, LH OUT+) — GND — Terminal 1S (24-pin, LH OUT-) — GND — Terminal 1U (24-pin, RH OUT+) — GND — Terminal 1W (24-pin, RH OUT-) — GND **For rear speakers** — Terminal 1I (24-pin, LH OUT+) — GND — Terminal 1K (24-pin, LH OUT-) — GND — Terminal 1M (24-pin, OUT+) — GND — Terminal 1O (24-pin, OUT-) — GND **For woofer** — Terminal 2D (8-pin, OUT+) — GND — Terminal 2C (8-pin, OUT-) — GND • Is there continuity?	Yes	Repair or replace the related wiring harnesses or the speaker unit. **Note** • If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio unit operates to cut the sound.
		No	Go to the next step.
6	• Turn the ignition switch to the LOCK position. • Disconnect the audio amplifier connector (24-pin) and audio unit connector (24-pin). • Inspect the continuity between audio amplifier terminal 1V (vehicle wiring harness-side) and the audio unit terminal 1J (vehicle wiring harness-side). • Is there continuity?	Yes	Replace the audio amplifier. (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.)
		No	Repair or replace the wiring harness between the audio amplifier and the audio unit. Go to the next step.
7	• Is there any sound?	Yes	The system is normal.
		No	Replace the audio amplifier. (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.)

Vehicles Without Bose

3	**No sound from all speakers/Possible DTC: 03:Er07, 03:Er10, 09:Er20, 09:Er21**

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio unit malfunction
- Short circuit in wiring harness between audio unit and speaker
- Short circuit inside speaker

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Press the AUDIO CONT button for **2 s or more**. • Play the CD or radio. • Adjust the volume between "10" and "15". • Is there any sound?	Yes	The system is normal.
		No	Go to the next step.
2	• Turn the ignition switch to the LOCK position. • Remove the audio unit. • Disconnect the audio connector (24-pin). • Inspect the continuity between the audio unit wiring harness-side connector terminal and ground: **For front speakers** — Terminal 1A (LH+) — GND — Terminal 1C (LH-) — GND — Terminal 1D (RH+) — GND — Terminal 1F (RH-) — GND **For rear speakers** — Terminal 1S (LH+) — GND — Terminal 1U (LH-) — GND — Terminal 1V (RH+) — GND — Terminal 1X (RH-) — GND — Is there continuity?	Yes	Repair or replace the related wiring harnesses or the speaker unit. **Note** • If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio unit operates to cut the sound.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.4 NO SOUND FROM SOME SPEAKERS[ENTIRE AUDIO SYSTEM]

id0903e2818100

Vehicles With Bose

4	No sound from some speakers/Possible DTC: —

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio amplifier malfunction
- Short circuit inside speaker
- Open or short circuit in wiring harness between audio amplifier and speaker
- Open or short circuit in wiring harness between audio amplifier and audio unit
- Poor connection of audio unit connector, terminal damage
- Poor connection of audio amplifier connector

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the audio unit on. • Press the AUDIO CONT button **1 s or more** (BAL/FAD cancel mode). • Press the POWER button and simultaneously press down the AUTO-M switch for approx. 1 s. **Note** • This function outputs sound to each speaker sequentially to allow determination of which speaker is not emitting sound. • Is there any speaker that does not output sound?	Yes	**If there is no sound from some speakers:** • Go to the next step. **If there is no sound at all:** • Go to troubleshooting "No.3 No sound from all speakers".
		No	The troubleshooting is completed.
2	• Does the same speaker output no sound if the audio source is changed? (Radio, CD)	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.) **Note** • If a different speaker outputs no sound, the audio unit is malfunctioning.
3	• Turn the ignition switch to the LOCK position. • Inspect the connection of the audio unit connector (24-pin). (For sound signal line) • Is the connector connected securely?	Yes	Go to the next step.
		No	Connect the audio unit connector (24-pin) securely.
4	• Turn the ignition switch to the LOCK position. • Remove the audio unit. • Disconnect the audio unit connector (24-pin). • Inspect the continuity between the audio unit wiring harness-side connector and ground. **For door speakers** — Terminal 1A (LH+) — GND — Terminal 1C (LH-) — GND — Terminal 1D (RH+) — GND — Terminal 1F (RH-) — GND **For rear speakers** — Terminal 1S (LH+) — GND — Terminal 1U (LH-) — GND — Terminal 1V (RH+) — GND — Terminal 1X (RH-) — GND • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 6.

STEP	INSPECTION		ACTION
5	• Inspect the continuity between the following terminals of the audio amplifier wiring harness-side connector (24-pin) and the audio unit wiring harness-side connector (24-pin). **For door speakers** — Terminal 1T (LH+) — Terminal 1A (LH+) — Terminal 1R (LH-) — Terminal 1C (LH-) — Terminal 1P (RH+) — Terminal 1D (RH+) — Terminal 1N (RH-) — Terminal 1F (RH-) **For rear speakers** — Terminal 1L (LH+) — Terminal 1S (LH+) — Terminal 1J (LH-) — Terminal 1U (LH-) — Terminal 1H (RH+) —Terminal 1X (RH-) — Terminal 1F (RH-) — Terminal 1V (RH+) • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses between the audio amplifier and the audio unit. Go to the next step.
6	• Inspect the connection of the audio amplifier connector (24-pin, 8-pin). • Is the connector connected securely?	Yes	Go to the next step.
		No	Connect the audio amplifier connector (24-pin, 8-pin) securely.
7	• Disconnect the audio amplifier (8-pin, 24-pin) and the speaker connector. • Inspect the continuity between the following terminals of the audio amplifier connector (8-pin, 24-pin) and the speaker connector. **For front speaker (LH)** — Terminal 1Q — Terminal B — Terminal 1S — Terminal A **For front speaker (RH)** — Terminal 1U — Terminal B — Terminal 1W — Terminal A **For tweeter (LH)** — Terminal 1Q — Terminal B — Terminal 1S — Terminal A **For tweeter (RH)** — Terminal 1U — Terminal B — Terminal 1W — Terminal A **For rear speaker (LH)** — Terminal 1I — Terminal B — Terminal 1K — Terminal A **For rear speaker (RH)** — Terminal 1M — Terminal B — Terminal 1O — Terminal A **For woofer** — Terminal 2D — Terminal B — Terminal 2C — Terminal A • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses.
8	• Inspect the continuity between the following terminals of the audio amplifier wiring harness-side connector (8-pin, 24-pin) and ground. **For front speakers and tweeter** — Terminal 1Q (LH OUT+) — GND — Terminal 1S (LH OUT-) — GND — Terminal 1U (RH OUT+) — GND — Terminal 1W (RH OUT-) — GND **For rear speakers** — Terminal 1I (LH OUT+) — GND — Terminal 1K (LH OUT-) — GND — Terminal 1M (RH OUT+) — GND — Terminal 1O (RH OUT-) — GND **For woofer** — Terminal 2D (OUT+) — GND — Terminal 2C (OUT-) — GND • Is there continuity?	Yes	Repair or replace for a short circuit between the audio amplifier and speaker wiring harnesses or inside the speaker unit. **Note** • If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio amplifier operates to cut the sound.
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	• Remove the suspect speaker. • Disconnect the speaker connector (2-pin) and inspect the resistance of the speaker. • Is the resistance normal? **Specification:** • Speaker resistance + wiring harness resistance **Note** • If the speaker lead wire contacts either the ground or vehicle frame, replace the speaker.	Yes	Replace the audio amplifier. (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.)
		No	Replace the speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.) (See 09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)

Vehicles Without Bose

4	**No sound from some speakers/Possible DTC: —**

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio unit malfunction
- Short circuit inside speaker
- Open or short circuit in wiring harness between audio unit and speaker
- Poor connection of audio unit connector, terminal damage

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the audio unit on. • Press the AUDIO CONT button **1 s or more** (BAL/FAD cancel mode). • Press the POWER button and simultaneously press down the AUTO-M switch for approx. 1 s. **Note** • The speaker outputting sound changes in the order of front passenger-side door. • Is there any speaker that does not output sound?	Yes	**If no sound from some speaker:** • Go to the next step. **If no sound at all:** • Go to the troubleshooting of "No.3 No sound from all speakers".
		No	The troubleshooting is completed.
2	• Does the same speaker output no sound if the audio source is changed? (Radio, CD)	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.) **Note** • If a different speaker outputs no sound, the audio unit is malfunctioning.
3	• Turn the ignition switch to the LOCK position. • Inspect the connection of the audio unit connector (24-pin). (for sound signal line) • Is the connector connected securely?	Yes	Go to the next step.
		No	Connect the audio unit connector (24-pin) securely.

STEP	INSPECTION		ACTION
4	• Turn the ignition switch to the LOCK position. • Remove the audio unit. • Disconnect the audio unit connector (24-pin). • Inspect the continuity between the audio unit wiring harness-side connector and ground. **For door speakers** — Terminal 1A (LH+) — GND — Terminal 1C (LH-) — GND — Terminal 1D (RH+) — GND — Terminal 1F (RH-) — GND **For rear speakers** — Terminal 1S (LH+) — GND — Terminal 1U (LH-) — GND — Terminal 1V (RH+) — GND — Terminal 1X (RH-) — GND • Is there continuity?	Yes	Repair or replace the related wiring harnesses or speaker unit. **Note** • If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio unit operates to cut the sound.
		No	Go to the next step.
5	• Remove the suspect speaker. • Disconnect the speaker connector (2-pin) and inspect the resistance of the speaker. • Is the resistance normal? **Specification:** • Speaker resistance + wiring harness resistance **Note** • If the speaker lead wire contacts either the ground or vehicle frame, replace the speaker.	Yes	Replace the speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION.) (See 09-20-8 REAR DOOR SPEAKER REMOVAL/ INSTALLATION.)
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.5 SOUND BREAK-UP OR POOR SOUND QUALITY[ENTIRE AUDIO SYSTEM]

id0903e2818300

5	Sound break-up or poor sound quality/Possible DTC: 09:Er21

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Improper speaker installation
- Audio unit malfunction
- Audio amplifier malfunction (with Bose)
- Door trim and/or package trim vibration

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is there sound break-up or poor sound quality from all speakers?	Yes	Go to the next step.
		No	Go to Step 5.
2	• Inspect the sound while adjusting the sound volume. • Is there sound break-up or poor sound quality between "15" and "20"?	Yes	Go to the next step.
		No	The system is normal.
3	• Inspect the BASS/TREB. • Is there poor sound quality between "-3 — +3" of the "BASS/TREB"? **Note** • When the AUDIO CONT button is pressed for a few seconds, BASS/TREB is set to "0".	Yes	Go to the next step.
		No	If there is sound break-up between "-6—+6" of the BASS/ TREB at the maximum volume, the system is normal.

STEP	INSPECTION		ACTION
4	• Attempt to duplicate the symptom on another vehicle. • Is the sound quality better than the customer's vehicle?	Yes	**Without Bose** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **With Bose** • Replace the audio amplifier if the following occurs: (See 09-20-7 AUDIO AMPLIFIER REMOVAL/ INSTALLATION.) — Noise occurs from a specific speaker. • Replace the audio unit if the following occurs: (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) — Noise occurs from two or more speakers.
		No	The system is normal.
5	• Identify the speaker with sound break-up by adjusting BAL/FADE. • Is the suspect speaker pointed upward?	Yes	Go to Step 7.
		No	Go to the next step.
6	• Inspect the speaker installation condition. • Is the speaker installed properly?	Yes	Go to the next step.
		No	Install the speaker properly.
7	• Remove the speaker. • Is there any foreign material penetration or damage to the speaker?	Yes	Repair or replace the suspect speaker.
		No	Go to the next step.
8	• Inspect the sound again. • Is there sound break-up?	Yes	Go to the next step.
		No	Inspect for vibration from the door trim and/or package trim. Repair or replace the suspect trim if necessary.
9	• Replace with a speaker known to be operational. (e.g., swap right and left speakers) • Is the sound break-up heard at the same location?	Yes	**Without Bose** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **With Bose** • Replace the audio amplifier if the following occurs: (See 09-20-7 AUDIO AMPLIFIER REMOVAL/ INSTALLATION.) — Noise occurs from a specific speaker. • Replace the audio unit if the following occurs: (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) — Noise occurs from two or more speakers.
		No	Replace the speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION.) (See 09-20-8 REAR DOOR SPEAKER REMOVAL/ INSTALLATION.)

NO.6 VOLUME INCREASES/DECREASES WHILE DRIVING THE VEHICLE[ENTIRE AUDIO SYSTEM]

id0903e2818500

6	Volume increases/decreases while driving the vehicle/Possible DTC: —

Troubleshooting hints

- Audio unit malfunction (without Bose)
- Audio amplifier malfunction (with Bose)

Note

- Inspect the ALC function while driving the vehicle and playing a CD.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does the ALC function turn on?	Yes	Go to the next step.
		No	**Without Bose** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.) **With Bose** • Replace the audio amplifier if the following occurs: (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.) — The volume changes suddenly.
2	• Turn the ALC function off. • Does the sound change while driving the vehicle?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	The system is normal. Explain the ALC function to the customer.

NO.7 ALC FUNCTION IS INOPERATIVE[ENTIRE AUDIO SYSTEM]

id0903e2803600

7	ALC function is inoperative/Possible DTC: —

Troubleshooting hints

- Audio unit malfunction
- Open or short circuit in vehicle speed signal wiring harness (e. g., instrument cluster)

Note

- Inspect the ALC function while driving the vehicle and playing a CD.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ALC function on. • Inspect the ALC function operation while driving the vehicle. (ALC level 3) • Does the ALC system operate properly?.	Yes	The system is normal. Explain the ALC function to the customer.
		No	Go to the next step.
2	• Verify DTC for audio unit using ON-BOARD DIAGNOSTIC TEST MODE. (See 09-02D-1 STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE[AUDIO].) • Is DTC 16:Er12 displayed?	Yes	Inspect and repair MULTIPLEX COMMUNICATION SYSTEM.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.8 NO AUDIO SYSTEM ILLUMINATION[ENTIRE AUDIO SYSTEM]

id0903e2818700

8	No audio system illumination/Possible DTC: 09:Er20, 21:Er19

Troubleshooting hints

- Poor connection of audio unit connector, terminal damage
- Audio unit malfunction
- Burnt fuse (TNS signal)
- Open or short circuit in TNS signal wiring harness
- Center panel malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is all the illumination on the audio unit turned off?	Yes	Go to the next step.
		No	Replace the center panel. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.)
2	• Turn the ignition switch to the LOCK position. • Inspect the fuse (ILLUMI). • Is the fuse normal?	Yes	Go to the Step 4.
		No	Go to the next step.
3	• Turn the ignition switch to the LOCK position. • Disconnect the audio unit connector (24-pin) and inspect the continuity between the audio unit wiring harness-side connector terminal 1E (TNS) and the ground. • Is there continuity?	Yes	Repair or replace the short circuit in the suspect wiring harness. After repairing the wiring harness, replace with the appropriate standard fuse.
		No	Go to the next step.
4	• Inspect the connection of the audio unit connector (24-pin). • Inspect both the audio unit and wiring harness-side connector terminal 1E for a poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If audio unit connector has a poor connection:** • Securely connect the audio unit connector. **If the audio unit side connector is malfunctioning:** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **If the wiring harness-side connector is malfunctioning:** • Repair or replace the pins and/or the connector.
5	• Connect the audio unit connector (24-pin). • Turn the ignition switch to the ACC position. • Inspect the voltage at the audio unit connector terminal 1E (TNS). • Is the voltage **B+** when the light switch is turned to the TNS position?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Repair or replace the related wiring harness (TNS signal).

DTC TABLE[ENTIRE AUDIO SYSTEM]

id0903e2856000

Screen display DTC (When starting on-board diagnostic test function)	Detection condition	Possible cause/inspection
03: Er01	CD player cannot implement insert and eject commands.	CD player malfunction
03: Er02	Cannot change tracks.	CD player malfunction
03: Er07	CD reading error.	• Defective CD (scratches or dirt) • CD player malfunction
03: Er10	CD player does not operate.	• Malfunction of connectors between base unit and CD player • CD player malfunction
05: Er01	CD changer (external) cannot implement insert, eject, and disc change commands.	• Defective CD (curved, broken or foreign material stuck/attached, etc.) • CD changer (external) malfunction
05: Er07	CD reading error.	• Defective CD (curved, broken or foreign material stuck/attached, etc.) • CD changer (external) malfunction
05: Er10	CD changer (external) does not operate.	• Defective CD (curved, broken or foreign material stuck/attached, etc.) • CD changer (external) malfunction
07: Er01	MD player cannot implement insert and eject commands.	MD player malfunction
07: Er02	Cannot change tracks.	MD player malfunction
07: Er07	MD reading error.	Defective MD
07: Er08	Blank unrecorded MD is inserted.	Defective MD
07: Er10	MD player does not operate.	• Malfunction of connectors between base unit and MD player • MD player malfunction
09: Er20	Audio system does not operate.	Voltage at base unit is low.
09: Er21	Broken sound/No sound	Inspect the audio system operation according to vehicle condition.
09: Er22	No radio reception	Inspect the radio operation according to vehicle condition.
16: Er12	Maltiplex communication system malfunction.	CAN system
21: Er19	Communication error between base unit and center panel	Malfunction of connectors between base unit and center panel
no Err	No DTCs stored	No DTCs stored

09-03E SYMPTOM TROUBLESHOOTING [RADIO]

FOREWORD[RADIO]

id0903e3801000

Note

- If the case location, time, and broadcasting station etc. can be specified through interview with the customer, there is the possibility that the signal reception environment is the cause of the problem.
- Perform confirmation of the symptom and evaluate under the conditions that the customer reported (location, time, broadcasting station etc.). If this is not possible, perform it under equivalent conditions.
- Before inspection or repair, record the broadcasting stations that customer has preset and reset them accordingly after the inspection or repair. Adjust the clock too.

Troubleshooting Index

No.	Symptom	Possible DTC
1	No radio reception (AM/FM)/No or low volume	09:Er20, 09:Er22
2	Noise from radio (AM only)	09:Er22
3	Noise from radio (FM only)	09:Er22
4	Cannot tune (SEEK does not stop)	09:Er20, 09:Er22
5	Cannot preset (preset function does not operate)	21:Er19
6	Reception frequency of radio slips	09:Er22

Quick Diagnostic Chart (Radio)

X: Applicable

Possible factor \ Troubleshooting item	1 No radio reception (AM/FM)/No or low volume	2 Noise from radio (AM only)	3 Noise from radio (FM only)	4 Cannot tune (SEEK does not stop)	5 Cannot preset (preset function does not operate)	6 Reception frequency of radio slips
Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc)	X	X	X			
Audio unit	X	X	X	X	X	X
Antenna plug poor connection	X	X	X	X		
Antenna feeder	X	X	X	X		
Open or short circuit in wiring harness between audio unit and antenna (antenna amplifier power supply system)	X	X	X	X		
Electronic jamming from outside, or inferior condition of broadcasting station radio wave	X	X	X	X		X
Antenna rod is not installed (standard parts)	X	X	X	X		
Noise from electrical system on vehicle (e.g. fuel pump)		X	X			
Battery		X	X			
Charging system		X	X			
Antenna installation loosened		X	X			
Center panel				X	X	

am3uuw0000024

CONFIRMATION STEP 1: RECEPTION CONDITION SYMPTOM (EXAMPLE)[RADIO]

id0903e3804000

Symptom	Antenna signal condition	Source
Only a buzzing sound from the speakers	• There is no radio station broadcasting. • Signals from the antenna to the audio unit are not transmitted.	• Electric noise caused by the operation of internal circuit from the audio unit itself • Atmospheric noise
A buzzing or crunching sound and normal sound produced at the same time from the speakers	• Though signals are transmitted from the antenna to the audio unit, electrical noise from other sources is greater.	• Electrical noise caused by the operation of electrical components on the vehicle • Electrical noise from high tension wires, transformer substation (factory), electrical feeder line (street car), or motorcycle.
A thumping sound and normal sound produced at the same time from the speakers (FM only)	• Noise occurs due to radio wave environment at specific places (e.g. in valleys between buildings). Noise varies when the vehicle itself or surrounding vehicles move. (FM only)	• Interference between direct and reflected waves of FM signals causes noise (Multipass noise).

CONFIRMATION STEP 2: ANTENNA SYSTEM SYMPTOM (EXAMPLE)[RADIO]

id0903e3804100

Possible cause	AM reception condition	FM reception condition
• Antenna feeder axis, open circuit • Antenna feeder plug not attached	NG: No reception	YES: Reception possible. (Sensitivity decreases, but reception is possible under strong electric field.)
• Antenna feeder axis (+) to ground (-), open circuit	NG: No reception	NG: No reception
• Antenna feeder and antenna, poor ground	YES: Reception possible (Noise may occur)	YES: Reception possible (Sensitivity decreases, but reception is possible under strong electric field.)
• Antenna feeder, jack and plug poor connection	NG: No reception (Depending on connection conditions)	YES: Reception possible (Depending on connection conditions)

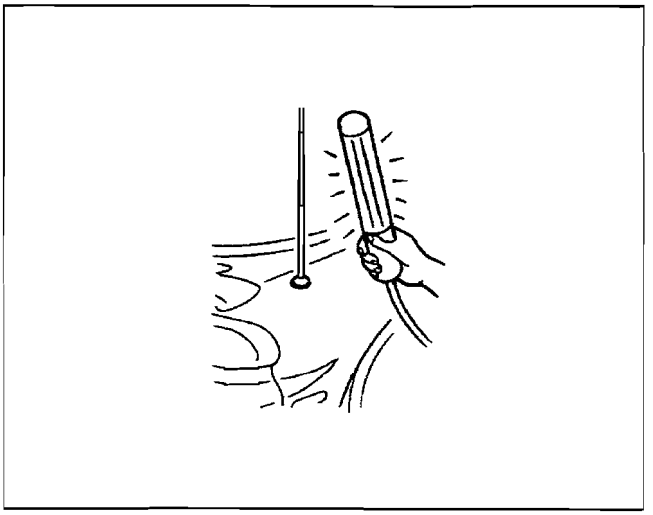
CONFIRMATION STEP 3: ANTENNA SYSTEM SIMPLE INSPECTION[RADIO]

id0903e3804200

- Because the antenna system is equipped with a capacitor, the continuity cannot be checked. Therefore proceed with the following simple inspection.
  1. Turn the AM radio on.
  2. Tune to the frequency that there is no broadcast and you will hear a buzzing sound.
  3. Turn a fluorescent light on and shake it around the antenna rod (around **10—20 mm**)

Note
- Use a fluorescent light type for the inspection. Accurate diagnostic cannot be done with a different type of light.

4. If a whirring sound from the speaker synchronized to the work light movement is confirmed, the antenna system is normal.



am3uuw0000017

NO.1 NO RADIO RECEPTION (AM/FM)/NO OR LOW VOLUME[RADIO]

id0903e3804300

1	No radio reception (AM/FM)/no or low volume/Possible DTC: 09:Er20, 09:Er22
POSSIBLE CAUSE	• Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) • Audio unit malfunction • Poor connection of antenna feeder plug • Antenna feeder malfunction • Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system) • Electronic jamming from outside, or inferior condition of broadcasting station radio wave • Antenna rod is not installed (standard parts)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the audio unit on. • Is the LCD indicated correctly?	Yes	Go to Step 3.
		No	Go to the next step.
2	• Measure the voltage at B+ and ACC terminals. • Is the voltage normal? **Specification** **With ignition switch ON: 11.5 V or more** **At idling: 12.5 V or more**	Yes	Go to the next step.
		No	Follow the diagnostic procedure for symptom No. 2 (Entire audio system).
3	• Set the volume between 10 and 15. • Is a buzzing sound or voice confirmed?	Yes	Go to the next step.
		No	Follow the diagnostic procedure for symptom No. 3 (Entire audio system) or No. 4 (Entire audio system).
4	• Tune to a local broadcasting station and check the reception condition. • Is the reception normal?	Yes	Go to the next step.
		No	Go to Step 6.
5	• Push the PRESET buttons and check the preset conditions. • Have preset stations been stored?	Yes	The system is normal.
		No	Preset broadcasting stations.
6	• Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed? **Note** • A TV antenna located close to the audio antenna can be the cause of noise. Relocate the TV antenna.	Yes	Go to the next step.
		No	Go to Step 8.
7	• Remove aftermarket electronic equipment. • Turn the audio unit on and check the reception condition. • Does reception improve?	Yes	The system is normal. (Explain to the customer that aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
8	• Refer to confirmation Step 3, and inspect the antenna system. • Is a whirring sound present?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Go to the next step.
9	• Inspect the antenna feeder plug connection condition. • Is the connection normal?	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
10	• Turn the ignition switch to the LOCK position. • Measure the continuity between the antenna feeder axis and ground. • Is there any continuity?	Yes	Replace the antenna feeder. (See 09-20-13 ANTENNA FEEDER LOCATION.)
		No	Go to the next step.
11	• Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply. • Is the voltage B+?	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

STEP	INSPECTION		ACTION
12	• Turn the ignition switch to the LOCK position. • Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition. If the reception has improved, troubleshooting is completed. If the reception has not improved, go to the next step.
13	• Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions. • Is the reception equivalent to the customer's unit? **Note** • Due to the following differences, you may sense a difference in reception efficiency. **(Vehicle factor)** — Antenna installation location, height, feeder wiring routing, optional electrical equipment **(Audio unit factor)** — High-tone setting: Decreases effective volume range when signals become weak. (Noise is easy to be conspicuous) — Noise restraint setting: Widens effective volume range when signals become weak. (Noise is not conspicuous.)	Yes	The system is normal. (It is caused by electronic jamming from outside, or inferior broadcasting station signal condition.)
		No	Replace audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.2 NOISE FROM RADIO (AM ONLY)[RADIO]

id0903e3804400

2	Noise from radio (am only)/Possible DTC: 09:Er22
POSSIBLE CAUSE	• Antenna rod is not installed (standard part) • Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) • Noise from electrical system on vehicle (e.g. fuel pump) • Battery malfunction • Charging system malfunction • Audio unit malfunction • Poor connection of antenna feeder plug • Antenna feeder malfunction • Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system) • Electronic jamming from outside, or inferior condition of broadcasting station radio wave • Antenna installation loosened

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Tune to a local broadcasting station and check the reception condition. • Is the reception normal?	Yes	Tune to the correct frequency for the broadcasting station. If not preset, preset it.
		No	Go to the next step.
2	• Inspect the antenna rod condition. • Is the antenna rod installed?	Yes	Go to the next step.
		No	Advise the customer to install the antenna rod when the radio is used. (It the antenna rod is not a standard part, replace it.)
3	• Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed? **Note** • A TV antenna located close to the audio antenna can be the cause of noise. Relocate the TV antenna.	Yes	Go to the next step.
		No	Go to Step 5.
4	• Remove aftermarket electronic equipment. • Turn the audio unit on and check the reception condition. • Does reception improve?	Yes	The system is normal. (Explain to the customer that aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
5	• Measure the battery voltage. • Is battery voltage normal? **Standard** **With ignition switch ON: 11.5 V or more** **At idling: 12.5 V or more** **Note** • Verify that the battery cables are connected to the terminals securely.	Yes	Go to the next step.
		No	Charge the battery. Inspect the charging system, and repair or replace if necessary.
6	• Does the noise occur only when the vehicle electrical system (e.g. fuel pump) operates? **Note** • Identify the suspect electrical component by disconnecting fuses, turning switches on & off, or disconnecting and connecting connectors. • It is easier to use the simulation function on the M-MDS.	Yes	Go to the next step.
		No	Go to Step 8.

STEP	INSPECTION		ACTION
7	• Verify the condition of the power supply and ground of the electric components, and the noise prevention capacitor. • Is noise present after the inspection? **Note** • Inspect the following: — Power supply to electrical component for voltage drop (compare with battery voltage) — Resistance between ground of electrical component and body. (Should be close to 0 ohm) — Installation condition of noise prevention capacitor for fuel pump.	Yes	Go to the next step.
		No	Troubleshooting completed. **Note** • The audio unit supplies 12 V battery power to the antenna amplifier for AM radio reception in the radio mode. The audio unit cannot receive AM signals without the 12 V battery power to the antenna amplifier. If the AM signals strengthen, the audio unit may receive the signals with noise.
8	• Inspect the antenna feeder plug connection condition. • Is the connection normal?	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
9	• Turn the ignition switch to the LOCK position. • Measure the continuity between the antenna the feeder axis and ground. • Is there any continuity?	Yes	Replace antenna feeder. (See 09-20-13 ANTENNA FEEDER LOCATION.)
		No	Go to the next step.
10	• Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply. • Is the voltage B+?	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
11	• Turn the ignition switch to the LOCK position. • Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception conditon. If the reception has improved, troubleshooting is completed. If the reception has not improved, go to the next step.
12	Compare the reception with another audio unit on same model (model/unit) under the same problem conditions. • Is the reception equivalent to the customer's unit? **Note** • Due to the following differences, you may sense a difference in reception efficiency. **(Vehicle factor)** — Antenna installation location, height, feeder wiring routing, optional electrical equipment **(Audio unit factor)** — High-tone setting: Decreases effective volume range when signals become weak. (Noise is easy to be conspicuous) — Noise restraint setting: Widens effective volume range when signals become weak. (Noise is not conspicuous.)	Yes	The system is normal (It is caused by electronic jamming from outside, or inferior broadcasting station signal condition).
		No	Go to the next step.
13	• Retighten the ground for the antenna and antenna amplifier. Retighten the antenna rod. • Is the noise present after retightening?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Troubleshooting completed.

NO.3 NOISE FROM RADIO (FM ONLY)[RADIO]

id0903e3804500

3	Noise from radio (FM only)/Possible DTC: 09:Er22
POSSIBLE CAUSE	• Antenna rod is not installed (standard part) • Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) • Noise from electrical system on vehicle (e.g. fuel pump) • Battery malfunction • Charging system malfunction • Audio unit malfunction • Poor connection of antenna feeder plug • Antenna feeder malfunction • Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system) • Electronic jamming from outside, or inferior condition of broadcasting station radio wave • Antenna installation loosened **Note** • FM broadcasts are known for good sound quality and resistance to noise, but FM broadcasts do carry characteristic noise. Though the audio unit is designed to reduce noise, there are times when noise occurs due to reception conditions.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Tune to a local broadcasting station and check the reception condition. • Is the reception normal?	Yes	Tune to the correct frequency for the broadcasting station. If not preset, preset it.
		No	Go to the next step.
2	• Inspect the antenna rod condition. • Is the antenna rod installed?	Yes	Go to the next step.
		No	Advise the customer to install the antenna rod when the radio is used. (It the antenna rod is not a standard part, replace it.)
3	• Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed?	Yes	Go to the next step.
		No	Go to Step 5.
4	• Remove aftermarket electronic equipment. • Turn the audio unit on and check the reception condition. • Does the reception improve?	Yes	The system is normal. (Explain to the customer that the aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
5	• Measure the battery voltage. • Is the battery voltage normal? **Standard** **With ignition switch ON: 11.5 V or more** **At idling: 12.5 V or more** **Note** • Verify that the battery cables are connected to the terminals securely.	Yes	Go to the next step.
		No	Charge the battery. Inspect the charging system, and repair or replace if necessary.
6	• Does the noise occur only when the vehicle's electrical system (e.g. fuel pump) operates? **Note** • Identify the suspect electrical component by disconnecting fuses, turning switches on & off, or disconnecting and connecting connectors. • It is easier to use the simulation function on the M-MDS.	Yes	Go to the next step.
		No	Go to Step 8.

STEP	INSPECTION		ACTION
7	• Verify the condition of the power supply and ground of the electric components, and the noise prevention capacitor. • Is the noise present after inspection? **Note** • Inspect the following: — Power supply to electrical component for voltage drop (compare with battery voltage) — Resistance between ground of electrical component and body. (Should be close to 0 ohm) — Installation condition of noise prevention capacitor for fuel pump.	Yes	Go to the next step.
		No	Troubleshooting completed.
8	• Inspect the antenna feeder plug connection condition. • Is the connection normal?	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
9	• Turn the ignition switch to the LOCK position. • Measure the continuity between the antenna feeder axis and ground. • Is there any continuity?	Yes	Replace the antenna feeder. (See 09-20-13 ANTENNA FEEDER LOCATION.)
		No	Go to the next step.
10	• Turn the ignition switch to the LOCK position. • Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition. If the reception has improved, troubleshooting is completed. If the reception has not improved, go to the next step.
11	• Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply. • Is the voltage B+? **Note** • 12 V is supplied from the audio unit to the antenna amplifier. (In radio mode) • Even if the power supply voltage is not supplied, FM reception is possible, however, noise interference occurs more easily.	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
12	• Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions. • Is the reception equivalent to the customer's unit?	Yes	The system is normal (It is caused by electronic jamming from outside, or inferior broadcasting station signal condition).
		No	Go to the next step.
13	• Retighten the ground for the antenna installation part and antenna amplifier. Retighten the antenna rod. • Is the noise present, after retightening? **Note** • When the antenna is not grounded properly, FM noise is likely to be noticed.	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Troubleshooting completed.

NO.4 CANNOT TUNE (SEEK DOES NOT STOP)[RADIO]

id0903e3804600

4	Cannot tune (seek does not stop)/Possible DTC: 09:Er20, 09:Er22
POSSIBLE CAUSE	• Center panel malfunction • Poor connection of antenna feeder plug • Antenna feeder malfunction • Audio unit malfunction • Electronic jamming from outside, or inferior condition of broadcasting station radio wave • Antenna rod is not installed • Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Verify that the SEEK switch is normal when the switch is operated. • Is it normal?	Yes	Go to the next step.
		No	Perform confirmation Step 1: audio panel switch confirmation. Replace the center panel if necessary.
2	• Inspect the indication on the information display. • Does the frequency indication increase or decrease when the SEEK switch is operated?	Yes	Go to the next step.
		No	Perform confirmation Step 1: audio panel switch confirmation. Replace the center panel if necessary.
3	• Manually tune to a local broadcasting station and check the reception condition. • Is the reception normal?	Yes	Go to Step 6.
		No	Go to the next step.
4	• Inspect the antenna feeder plug connection condition. • Is the connection normal?	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
5	• Turn the ignition switch to the LOCK position. • Measure the continuity between the antenna feeder axis and ground. • Is there any continuity?	Yes	Replace antenna feeder. (See 09-20-13 ANTENNA FEEDER LOCATION.)
		No	Go to the next step.
6	• Turn the ignition switch to the LOCK position. • Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A. • Is there any continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition. If the reception has improved, troubleshooting is completed. If the reception has not improved, go to the next step.
7	• Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply. • Is the voltage B+?	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
8	• Check if the number of broadcasting stations changes depending on time and place. • Does it change?	Yes	The system is normal. (Explain to customer that SEEK sometimes does not stop depending on the signal reception condition.) **Note** • Signals tend to reach longer distances at night. (It is conspicuous in AM signals, several audio functions may stop due to foreign broadcasting station or noise.) Though the audio system restrains sensitivity of SEEK and SCAN functions at night, the audio system may select broadcasting stations other than those desired when signals are considerably strong. This function is linked to the parking light. When the parking light or the headlights are turned on, SEEK and SCAN may not function for weak signals.
		No	Replace audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.5 CANNOT PRESET (PRESET FUNCTION DOES NOT OPERATE)[RADIO]

id0903e3804700

5	Cannot preset (preset function does not operate)/Possible DTC: 21:Er19
POSSIBLE CAUSE	• Audio unit malfunction • Center panel malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Tune to the desired station and press channel preset button 1 for **about 2 s** to store it. • Repeat the above for other stations using channel preset buttons 2 to 5. • Press channel preset button 1 to 6 one by one. • Are the stored stations present?	Yes	Go to the next step.
		No	Go to Step 3.
2	• Turn the ignition switch to the LOCK position, and then to ACC. • Check if the preset stations are stored by pressing the preset buttons. • Are the stations stored?	Yes	The system is normal. (Explain preset procedure to customer using Owner's Manual)
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
3	• Remove the center panel from the audio unit, and reinstall the center panel to the audio unit to check the connector connections. • Turn the audio power switch on. • Press the POWER button and simultaneously pull up the CLOCK switch at same time for **approximately 1 s** to enter the system to switch to the check mode. • Press all buttons and check if a buzzing sound occur. • Are all the buttons normal?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Replace the center panel. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.)

09-03E

NO.6 RECEPTION FREQUENCY OF RADIO SLIPS[RADIO]

id0903e3804800

6	Reception frequency of radio slip/Possible DTC: 09:Er22
POSSIBLE CAUSE	• Audio unit malfunction • Electronic jamming from outside, or inferior condition of broadcasting station radio wave

Diagnostic procedure

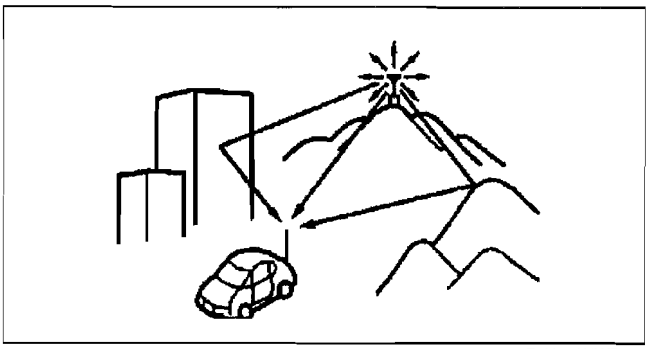
STEP	INSPECTION		ACTION
1	• Operate the SEEK switch and check if the desired broadcasting station is tuned. • Is it normal?	Yes	Go to Step 3.
		No	Go to the next step.
2	• Check if another broadcasting station is received at a certain location when the indication of the reception frequency remains. • Are other station received? **Note** • While receiving a weak signal from one broadcasting station and approaching a broadcasting antenna which emits a strong signal, broadcasting from the strong signal is sometimes received.	Yes	Go to the next step.
		No	Replace audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
3	• Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions. • Is the reception equivalent to the customer's unit?	Yes	Troubleshooting completed (Audio unit is normal).
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

RADIO[RADIO]

id0903e3807000

1. Multipath Noise

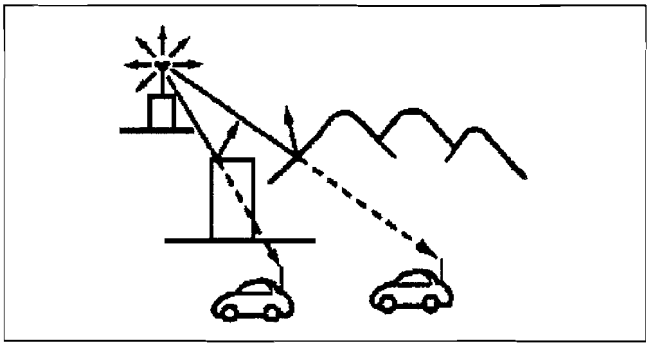
- Signals from an FM transmitter are high frequency and similar to beams of light because they do not bend around corners, but they do reflect. Since FM signals can be reflected by obstructions, it is possible to receive both the direct signal and the reflected signal at the same time. This causes a slight delay in reception and may be heard as a broken sound or a distortion.



E6U902HWB007

2. Flutter/Skip Noise

- Signals become weak in valleys between mountains, tall buildings, and other obstacles. When the vehicle passes through such an area, the reception conditions may change suddenly, resulting in annoying noise.



E6U902HWB008

3. Stereo and Monaural Receptions

- As signals become weak, noise may appear more in stereo reception. Compared to stereo reception, noise in monaural reception is relatively less apparent.

Audio Reception Improvement Measures

Separation control

- Utilizing the characteristic of monaural reception that noise is relatively less apparent than stereo reception, the audio system automatically changes the reception from stereo to monaural and lessens annoying noise when signals become weak or a multipath phenomenon occurs.

High tone control

- When signals become weak or a multipath phenomenon occurs, the audio system restrains the volume level in the high frequency band and lessens the annoying noise.

Effect Setting for Separation Control and High Tone Control

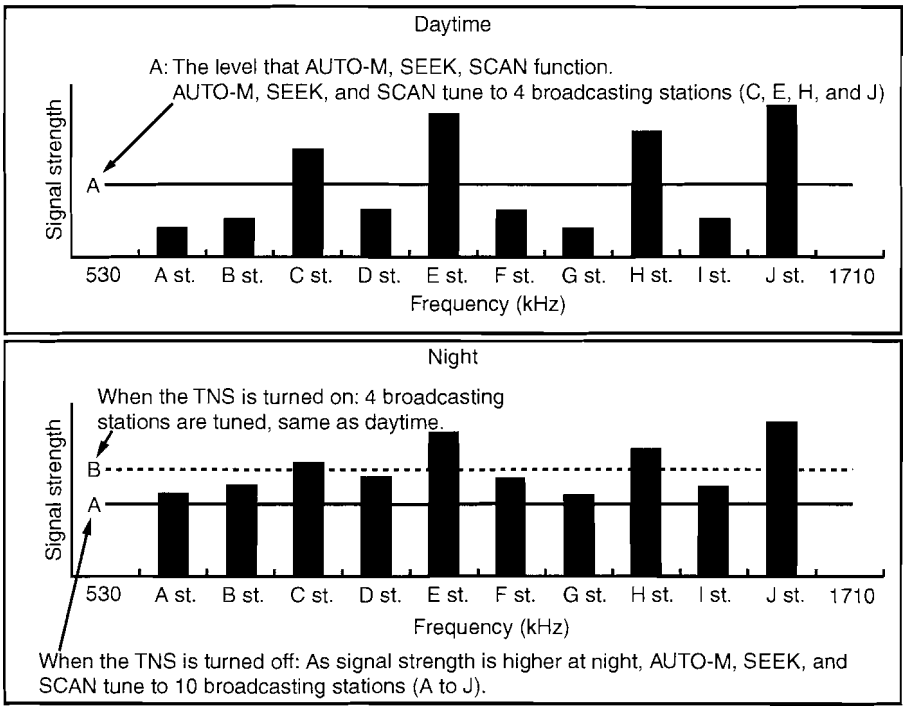
- The separation and high tone controls influence sound quality, Therefore they are specifically tuned to the individual model. (Comparison of characteristic must be done on the same models)

High tone setting	⇨	Less effective range	⇨	Noise is conspicuous
Noise restraint setting	⇨	Wider effective range	⇨	Noise is less conspicuous

DPE903EW1V0A

Remarks

- Signals tend to reach longer distances at night. This is particularly true for AM signals where foreign broadcasts or noise may cause inadvertent operation. Though the audio system restrains the sensitivity of the SEEK and SCAN functions at night, the audio system may select other than desired broadcasting stations other than those desired when signals are considerably strong. This function is linked to the parking light. When the parking light or the headlights are turned on, SEEK and SCAN may not function for weak signals.



e5u903azw5s03

09-03F SYMPTOM TROUBLESHOOTING [CD PLAYER/CHANGER]

FOREWORD[CD PLAYER/CHANGER]

id0903e5801000

Troubleshooting Index

No.	Items	Symptom	Possible DTC
1	CD player/changer	CD player/changer does not load the CD or ejects the CD immediately	03:Er01, 03:Er10
2		CD player/changer does not eject the CD	03:Er01
3		CD player/changer does not play the CD/No sound	03:Er07, 03:Er10
4		Sound jumps	03:Er02
5		Scratches on the CD	03:Er02
6	CD changer	Disc changer is inoperative	—
7	CD player/changer	Track change is inoperative	03:Er02

X: Applicable

Troubleshooting Item / Possible factor	CD player/changer					CD changer	CD player/changer
	1	2	3	4	5	6	7
	CD player/changer does not load the CD or ejects the CD immediately	CD player/changer does not eject the CD	CD player/changer does not play the CD/No sound	Sound jumps	Scratches on the CD	Disc change is inoperative	Track change is inoperative
CD is inserted upside down	X		X				
Audio unit is malfunctioning	X	X	X	X	X	X	X
Defective CD (egg., cracked, badly bent, rough edges, scratch, dirty CD, condensation)	X	X	X	X			X
Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)	X	X	X				X
Poor connection of audio unit connector or terminal (e.g., damaged, bent, pull-out pin, corrosion)	X	X					
Improper center panel installation		X				X	
Improper CD cover installation		X					
Improper audio unit installation (e.g., rattle, loose)				X			
Inadequate tire pressure				X			
Deformed disc is used (e.g., out of specification (thickness), bent disc)	X	X			X		
Multiple CDs are inserted into the CD player at the same time		X			X		
Center panel is malfunctioning						X	X
CD-R/RW written format is out of specification							
MP3 and other format data are on the CD-R/RW							
File extension for MP3-formatted file is incorrect (Correct: ".mp3", Incorrect: e.g., RIFF)							
Defective CD-R/RW (e.g., dirty CD, scratch)							
Conflict of ID tag version for CD-R/RW							
Improper folder and/or music title in CD-R/RW							
The number of characters for the folder/music file name on the CD-R/RW exceeds the maximum number of characters							
Improper encode on CD-R/RW							
MP3 applicable CD player is malfunctioning							X
No title input in CD-R/RW							
Input title text using 2-byte characters							
Data other than audio data is in CD-R/RW							

am3uuw0000016

NO.1 CD PLAYER/CHANGER DOES NOT LOAD THE CD OR EJECTS THE CD IMMEDIATELY[CD PLAYER/CHANGER]

id0903e5826100

1	**CD player/changer does not load the CD or ejects the CD immediately/ Possible DTC: 03:Er01, 03:Er10**

Troubleshooting hints

- CD is inserted upside down
- Audio unit is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)
- Poor connection of audio unit connector or terminal (e.g., damaged, bent, pulled-out pin, corrosion)
- Deformed disc is used (e.g., out of specification (thickness), bent disc)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is CD inserted properly, label-side up?	Yes	Go to the next step.
		No	Explain to the customer that the CD should be inserted into the slot label-side up.
2	• Replace with a CD known to be operational. • Does the CD player/changer load the CD?	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
3	Visually inspect the CD. — Is there any dirt, scratches or deformation on the CD? — Is the CD a non-conventional disc?	Yes	Explain to the customer that the defective CD or non-conventional disc cannot be used.
		No	Go to the next step.
4	• Turn the ignition switch to the LOCK position. • Inspect the connection of the audio unit connector (24-pin). • Inspect both the audio unit connector and wiring harness-side connector for a poor connection. (such as damaged/bent/pulled-out pins, corrosion) • All the pins and connector normal?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	**If the audio unit connector/pin is malfunctioning:** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **If the wiring harness-side connector/pin is malfunctioning:** • Repair or replace the pins and/or the connector.

NO.2 CD PLAYER/CHANGER DOES NOT EJECT THE CD[CD PLAYER/CHANGER]

id0903e5826200

2	CD player/changer does not eject the CD/Possible DTC:03:Er01

Troubleshooting hints

- Audio units is malfunctioning
- Defective CD. (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)
- Poor connection of audio unit connector or terminal (e.g., damaged, bent, pulled-out pin, corrosion)
- Improper center panel installation
- Improper CD cover installation
- Deformed disc is used (e.g., out of specification (thickness), bent disc).
- Multiple CDs are inserted into the CD player at the same time

Note

- The CD may be malfunctioning if the CD player/changer does not eject a certain CD only. Inspect the CD player/changer operation using a CD known to be operational.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the operation of the audio system other than the CD player/changer (e.g. Radio). • Does the other audio system operate?	Yes	Go to Step 3.
		No	Go to the next step.
2	• Turn the ignition switch to the LOCK position. • Inspect the connection of the audio unit connector (24-pin). • Inspect both audio unit connector and wiring harness-side connector for poor connection. (such as damaged/bent/pulled-out pins, corrosion) • Are all the pins and connectors normal?	Yes	Go to the next step.
		No	**If the audio unit connector/pin is malfunctioning:** • Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY.) **If the wiring harness-side connector/pin is malfunctioning:** • Repair or replace the pins and/or the connector.
3	• Eject the CD. • Is the CD ejected from the CD player/ changer?	Yes	Go to the next step.
		No	Inspect the center panel and CD cover installation. Securely install the center panel and/or CD cover if necessary.
4	• Insert the CD into the CD player/changer. • Does the CD insert into the CD player/ changer smoothly?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Install the center panel and/or CD cover properly, then go to the next step.
5	• Is the CD ejected from the CD player/ changer?	Yes	Troubleshooting completed. Explain repairs to the customers.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.3 CD PLAYER/CHANGER DOES NOT PLAY THE CD/NO SOUND[CD PLAYER/CHANGER]

id0903e5806100

3	CD player/changer does not play the CD/No sound/Possible DTC:03:Er07, 03:Er10

Troubleshooting hints

- CD is inserted upside down
- Audio units is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the radio on and check for sound. • Is there sound output? **Note** • Check the volume dial position.	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.3 (Audio system).
2	• Was the CD inserted properly, label-side up?	Yes	Go to the next step.
		No	Explain to the customer that the CD should be inserted into the slot label-side up.
3	• Replace with a CD known to be operational. • Does the CD player/changer load the CD?	Yes	Go to the next step.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
4	• Visually inspect the CD. — Is there any dirt, scratches or deformation on the CD? — Is the CD a non-conventional disc?	Yes	Explain to the customer that the defective CD or non-conventional disc cannot be use.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.4 SOUND JUMPS[CD PLAYER/CHANGER]

id0903e5806200

4	Sound jumps/Possible DTC:03:Er02

Troubleshooting hints

- Audio unit is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Improper audio unit installation (e.g., rattle, loose)
- Inadequate tire pressure

Note

- The CD may be malfunctioning if the sound jumps on a certain CD only. Inspect the CD player/changer operation using a CD known to be operational.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does the sound jump when the vehicle is stopped?	Yes	Go to the Step 6.
		No	Go to the next step.
2	• Drive the vehicle. • Does the sound jump when driving over uneven surfaces?	Yes	Go to the next step.
		No	Go to the Step 6.
3	• Is the audio unit installed securely?	Yes	Go to the next step.
		No	Install the audio unit securely.
4	• Inspect the tire pressure. • Is the tire pressure normal?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Go to the next step.
5	• Adjust the tire pressure within specification. • Does the sound jump when driving the vehicle?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Audio system is normal. Explain repairs to the customers.
6	• Replace with a CD other than the one known to be operational. • Does the sound jump when driving the vehicle?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Audio system is normal. Explain to the customer that the CD is malfunctioning.

NO.5 SCRATCHES ON THE CD[CD PLAYER/CHANGER]

id0903e5818200

5	Scratches on the CD/Possible DTC:03:Er02

Troubleshooting hints

- Audio unit is malfunctioning
- Deformed disc is used (e.g., out of specification (thickness), bent disc)
- Multiple CDs are inserted into the CD player at the same time

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Were multiple CDs inserted into the CD player at the same time?	Yes	Explain to the customer to insert CDs one by one.
		No	Go to the next step.
2	• Visually inspect the CD. • Is the CD deformed disc (e.g., out of specification (thickness), bent disc)?	Yes	Audio system is normal. Explain to the customer that the CD is malfunctioning.
		No	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)

NO.6 DISC CHANGE IS INOPERATIVE[CD PLAYER/CHANGER]

id0903e5806400

6	Disc change is inoperative/Possible DTC: —

Troubleshooting hints

- Audio unit is malfunctioning
- Improper center panel installation
- Center panel is malfunctioning

09-03F

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Inspect the CD changer operation. • Does the CD changer operate properly?	Yes	Go to the next step.
		No	Go to symptom troubleshooting "No.3 CD player/changer does not play the CD/No sound".
2	• Inspect the following: — Is the display shown properly when operating the disc change button? — Does the radio band selection operate properly?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Go to the next step.
3	• Inspect the center panel installation. • Does the CD changer change the disc properly after re-installing the center panel?	Yes	Install the center panel securely and properly.
		No	Go to "No.1 Audio panel switch inspection" in this section. Replace the center panel if necessary.

NO.7 TRACK CHANGE IS INOPERATIVE[CD PLAYER/CHANGER]

id0903e5806900

7	Track change is inoperative/Possible DTC:03:Er02

Troubleshooting hints

- Audio unit is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)
- Center panel is malfunctioning
- MP3 applicable CD player is malfunctioning

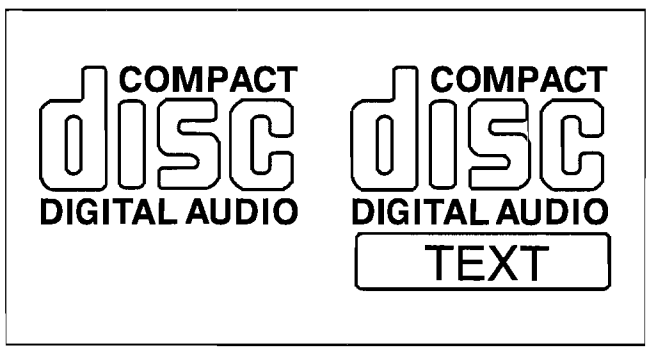
Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Replace with a CD known to be operational. • Does the CD player change the track?	Yes	Explain to the customer that the defective CD or a non-conventional disc cannot be used.
		No	Go to the next step.
2	• Inspect the center panel installation. • Does the CD player change the track number on the display when pressing the track up or down button?	Yes	Replace the audio unit. (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ASSEMBLY.)
		No	Go to the "No.1 Audio panel switch inspection" in this section. Replace the center panel if necessary.

AUDIO CD[CD PLAYER/CHANGER]

id0903e5807100

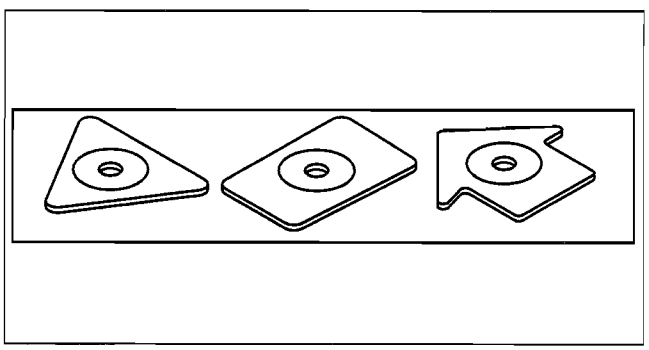
- The CD player/changer has been designed to play CDs bearing the identification logo, COMPACT DISC DIGITAL AUDIO, as shown. No other discs can be played on the CD player/changer other than MP3 applicable ones.
- The CD player/changer may not play the following types of CDs:
  - — Defective CDs (e.g., cracked, badly bent, rough edges, scratch, dirty CD condensation)
  - — 8 cm (3 in) CD accessories (e.g., 8 cm (3 in) disc adapter, sticker, label)
  - — Nonstandard CDs (e.g., Diameter/thickness is out of specification)
    Specification: 119.7—120.3 mm (4.668—4.692 in) of diameter, 1.2+0.3 or -0.1 mm (0.047+0.012 or 0.004 in) of thickness
- Do not use non-conventional discs. The CD player/changer could be damaged.



am3uuw0000016

Examples:

- Although the same physical size as the compact disc, SACDs use a different kind of digital audio signal called Direct Stream Digital.
- The CD player/changer may not play the CD-R/RW properly due to the disc condition (excluding MP3).



am3uuw0000016

09-03G SYMPTOM TROUBLESHOOTING [CAR-NAVIGATION SYSTEM]

CAR-NAVIGATION SYSTEM[CAR-NAVIGATION SYSTEM]

id0903e8801600

Troubleshooting Index

- Use the chart below and verify the trouble in order to diagnose the appropriate area.

No.	Malfunction symptom
1	Display screen does not open even if the ignition switch is turned to the ACC position.
2	Display screen changes to black.
3	Display screen changes to white.
4	System does not load map disc.
5	Vehicle position deviates from the route map.
6	Car-navigation control switch is inoperative.
7	No voice navigation
8	Display screen does not change to the night mode. (Front and rear combination lights operate normally.)

Quick diagnostic chart

X: Applicable

Possible factor \ Troubleshooting item	1	2	3	4	5	6	7	8
	Display screen does not open even if the ignition switch is turned to the ACC position.	Display screen changes to black.	Display screen changes to white.	System does not load the map disc.	Vehicle position deviates from the route map.	Car-navigation control switch is inoperative.	No voice navigation.	Display screen does not change to the night mode.
Open or short circuit in power supply (B+) wiring harness, or burnt fuse	X							
Open or short circuit in power supply (ACC) wiring harness, or burnt fuse	X							
Open or short circuit in GND wiring harness	X							
Short circuit in car-navigation control switch wiring harness	X							
LCD unit malfunction	X	X	X			X		X
Poor connection of LCD unit connector, terminal damage	X	X				X		X
Poor connection of car-navigation unit connector, terminal damage		X			X		X	
Car-navigation unit malfunction		X	X	X	X		X	X
Open or short circuit in feeder line between GPS antenna and car-navigation unit					X			
Improper adjustment of screen contrast			X					
Map disc malfunction				X				
Moisture inside of car-navigation unit				X				
Non-designated disc inserted				X				
Jammed radio signals from after market equipment					X			
Open or short circuit in vehicle speed signal wiring harness					X			
Poor connection of GPS antenna connector, terminal damage					X			
GPS antenna malfunction					X			
Open or short circuit in car-navigation unit (power supply (B+)) wiring harness		X						
Open or short circuit in car-navigation unit (power supply (ACC)) wiring harness		X						
Open or short circuit in car-navigation unit (GND) wiring harness		X						
Car-navigation control switch malfunction						X		
Open or short circuit in remote control signal wiring harness						X		
Poor connection of car-navigation control switch connector, terminal damage						X		
Improper adjustment of NAVI voice volume							X	
Poor connection of driver-side front door speaker connector, terminal damage							X	
Driver-side front door speaker malfunction							X	
Open or short circuit in driver-side front door speaker wiring harness							X	
Improper setting of NAVI map indication								X
Open or short circuit in TNS signal wiring harness								X

am3uuw0000015

NO.1 DISPLAY SCREEN DOES NOT OPEN EVEN IF THE IGNITION SWITCH IS TURNED TO THE ACC POSITION.[CAR-NAVIGATION SYSTEM]

id0903e8801700

1	Display screen does not open even if the ignition switch is turned to the ACC position.
POSSIBLE CAUSE	• Open or short circuit in power supply (B+ or ACC) wiring harness or burnt fuse • Open or short circuit in ground wiring harness • LCD unit malfunction • Poor connection of LCD unit connector, terminal damage • Short circuit in car-navigation control switch wiring harness **Caution** • **Forcibly opening/closing, or placing an object on the display screen may cause the display screen to become inoperable.**

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ACC position. • Press the OPEN/CLOSE button on the LCD unit. • Does the display screen open?	Yes	The system is normal. **Note** • If the display screen is closed by pressing the OPEN/CLOSE button of the LCD unit with the ignition switch in the ACC position, the display screen will remain closed when the ignition switch is turned to the ACC position again.
		No	Go to the next step.
2	• Turn the ignition switch to the LOCK position. • Inspect the following fuses: — RADIO 15 A fuse — ROOM 15 A fuse • Are the fuses damaged?	Yes	Go to the next step.
		No	• Replace with the appropriate standard fuse. — If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.
3	• Remove the car-navigation control switch. • Disconnect the car-navigation control switch connector (6-pin). • Turn the ignition switch to the ACC position. • Inspect the voltage between the car-navigation control switch wiring harness-side connector (6-pin) terminal A (POWER) and B (ground). • Is the voltage B+?	Yes	Go to Step 5.
		No	Go to the next step.
4	• Turn the ignition switch to the LOCK position. • Inspect the continuity between terminal A (POWER) and B (ground) at the car-navigation control switch wiring harness-side connector. • Is there continuity?	Yes	Repair or replace the suspected wiring harness. Replace the LCD unit. (ACC protector circuit inside LCD unit broken.)
		No	Go to the next step.
5	• Remove the LCD unit. • Inspect the connection of the LCD unit connector (24-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the LCD unit connector (24-pin).
6	• Disconnect the LCD unit connector (24-pin). • Inspect both LCD unit connector and wiring harness-side connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the LCD unit connector is wrong:** • Replace the LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
7	• Inspect the voltage between LCD unit wiring harness-side connector (24-pin) terminal Q (B+) and P (ground) • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the suspect wiring harness, then repair or replace the wiring harness.
8	• Turn the ignition switch to the ACC position. • Inspect the voltage between LCD unit wiring harness-side connector (24-pin) terminal O (ACC) and P (ground). • Is the voltage **B+**?	Yes	Replace the LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.)
		No	Inspect the suspect wiring harness, then repair or replace the wiring harness.

NO.2 DISPLAY SCREEN CHANGES TO BLACK.[CAR-NAVIGATION SYSTEM]

id0903e8801800

2	Display screen changes to black.
POSSIBLE CAUSE	• Open or short circuit in car-navigation unit (power supply (B+)) wiring harness • Open or short circuit in car-navigation unit (power supply (ACC)) wiring harness • Open or short circuit in car-navigation unit (ground) wiring harness • Open or short circuit in wiring harness between LCD unit and car-navigation unit • Poor connection of car-navigation unit connector, terminal damage • Poor connection of LCD unit connector, terminal damage • Car-navigation unit malfunction • LCD unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ON position. • Does the display screen change from blank to NAVI mode when pressing the joystick of the car-navigation control switch?	Yes	The system is normal. **Note** • If the "VOICE" button is pressed for **approx. 2 s or more**, the "DISP OFF" menu appears on the bottom-left side of screen. If "DISP OFF" mode is selected, the LCD unit will not display anything. "DISP OFF" mode is cancelled when the ignition switch is turned to the LOCK position or the joystick of the car-navigation control switch is pressed.
		No	Go to the next step.
2	• Turn the ignition switch to the LOCK position. • Remove the car-navigation unit. • Inspect the car-navigation unit connector (24-pin). • Is the car-navigation unit connector connected securely?	Yes	Go to the next step.
		No	Securely connect the car-navigation unit connector (24-pin).
3	• Disconnect the car-navigation unit connector. • Inspect both car-navigation unit connector and wiring harness-side connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the car-navigation unit connector is wrong:** • Replace the car-navigation unit. **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
4	• Inspect the voltage between the car-navigation unit wiring harness-side connector (16-pin) terminals B (B+) and A (ground). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the suspect wiring harness and repair or replace the wiring harness if necessary.
5	• Turn the ignition switch to the ACC position. • Inspect the voltage between the car-navigation unit wiring harness-side connector (16-pin) terminals D (ACC) and A (ground). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the suspect wiring harness and repair or replace the wiring harness if necessary.
6	• Turn the ignition switch to the LOCK position. • Remove the LCD unit. • Inspect the LCD unit connector (24-pin). • Is the LCD unit connector connected securely?	Yes	Go to the next step.
		No	Securely connect the LCD unit connector (24-pin).
7	• Disconnect the LCD unit connector (24-pin). • Inspect both LCD unit connector and wiring harness-side connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the LCD unit connector is wrong:** • Replace the LCD unit. **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.

STEP	INSPECTION		ACTION
8	• Inspect the following wiring harnesses between the LCD unit and navigation unit. — Terminal A (24-pin, B)—terminal T (24-pin, B) — Terminal B (24-pin, G)—terminal V (24-pin, G) — Terminal C (24-pin, SYNC)—terminal R (24-pin, SYNC) — Terminal D (24-pin, R)—terminal X (24-pin, R) — Terminal E (24-pin, VGND1)—terminal U (24-pin, VGND1) • Is there an open or short circuit?	Yes	Go to the next step.
		No	Repair or replace the suspected wiring harness.
9	• Inspect the following wiring harnesses between the LCD unit and car-navigation unit. — Terminal I (24-pin, SI01)—terminal N (24-pin, SI01) — Terminal K (24-pin, SI02)—terminal P (24-pin, SI02) • Is there an open or short circuit?	Yes	Replace the LCD unit, then go to the next step.
		No	Repair or replace the suspected wiring harness.
10	• Does system work properly?	Yes	Troubleshooting is completed.
		No	Replace the car-navigation unit.

NO.3 DISPLAY SCREEN CHANGES TO WHITE.[CAR-NAVIGATION SYSTEM]

id0903e8801900

09-03G

3	Display screen changes to white.
POSSIBLE CAUSE	• Car-navigation unit malfunction • LCD unit malfunction • Improper adjustment of the screen contrast

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Does the display screen change to "display quality adjustment" mode when pressing the MODE button for **approx. 2 s or more**? • Does system work properly?	Yes	Go to the next step.
		No	Replace the LCD unit.
2	• Select "default display" or "display quality adjustment" mode in the NAVI mode. • Press "ENTER" button. • Does system work properly?	Yes	Troubleshooting is completed.
		No	Replace the LCD unit, then go to the next step.
3	• Does system work properly?	Yes	Troubleshooting is completed.
		No	Replace the car-navigation unit.

NO.4 SYSTEM DOES NOT LOAD THE MAP DISC.[CAR-NAVIGATION SYSTEM]

id0903e8802000

4	System does not load the map disc.
POSSIBLE CAUSE	• Car-navigation unit malfunction • Map disc malfunction • Moisture inside of car-navigation unit • Non-designated disc is inserted **Note** • If dewdrops are formed inside of the car-navigation unit, the display screen shows the "The disc installed is not a map DVD" message. Remove the map disc, ventilate or remove moisture from the passenger compartment, and then leave it **for approx. 1 h**. The dewdrops will be removed and the car-navigation unit will operate normally. • In case of a dirty/damaged map disc or car-navigation unit malfunction, the display screen will show the "Please insert a map DVD" message for few seconds to 1 min, then change to "The disc installed is not a map DVD" message after the ignition switch is turned to the ACC position. • If a non-designated disc is inserted, the display screen shows the "The disc installed is not a map DVD" message.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Eject the map disc. • Is the map disc normal?	Yes	Go to the next step.
		No	Insert a designated disc, then go to the next step.
2	• Eject the map disc then insert it again. • Does the system load the map disc?	Yes	Troubleshooting is completed.
		No	Go to the next step.
3	• Eject the map disc and clean the surface of map disc with a soft cloth. • Insert map disc again. • Does the system load the map disc?	Yes	Troubleshooting is completed.
		No	Replace car-navigation unit and map disc at the same time. (consult distributor) (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)

NO.5 VEHICLE POSITION DEVIATES FROM THE ROUTE MAP.[CAR-NAVIGATION SYSTEM]

id0903e8802100

5	Vehicle position deviates from the route map.
POSSIBLE CAUSE	• Jammed radio signals from after market equipment (radar, remote engine starter, anti-theft device or other.) • Open or short circuit in the wiring harness (vehicle speed signal related). • Car-navigation unit malfunction. • Poor connection of the GPS antenna connector, terminal damage • GPS antenna malfunction. • Open or short circuit in feeder line between GPS antenna and car-navigation unit. • Poor connection of the car-navigation unit connector, terminal damage.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is any of the following after-market equipment installed? (Inspect especially near the GPS antenna.) — Radar — Remote engine starter — Anti-theft device — Other	Yes	Go to the next step.
		No	Go to Step 3.
2	• Remove the after-market equipment. **Note** • The procedure requires an assistant. • Drive the vehicle without any obstacles. • Does the vehicle indicator follow the steering wheel direction?	Yes	System is normal. The after-market electrical device might be interrupting the GPS reception.
		No	Go to the next step.
3	• Position the vehicle without any obstacles and receive GPS for **5 min** at idle. • Does "GPS" show up on the left lower side of the display screen?	Yes	Go to the next step.
		No	Go to Step 8.

STEP	INSPECTION		ACTION
4	**Caution** • **This procedure requires an assistant.** • Start the diagnostic function. • Drive the vehicle. • Check the "Speed" on the diagnosis screen. • Does the "Speed" change according to the vehicle speed? **Note** • If the engine is started after the diagnostic function is activated, the diagnostic function mode is reset.	Yes	Go to the next step.
		No	Go to Step 6.
5	**Caution** • **This procedure requires an assistant.** • Drive the vehicle and turn the steering wheel to the left and/or right. • Does the vehicle indicator follow the steering direction?	Yes	The system is normal. **Note** • The vehicle indicator might be out of position in the following areas: — Parallel road, high-level road, loop road, tower type parking, high-rise buildings lot
		No	Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
6	• Turn the ignition switch to the LOCK position. • Remove the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.) • Inspect the connection of the car-navigation unit connector (16-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the car-navigation unit connector (16-pin).
7	• Disconnect the car-navigation unit connector (16-pin). • Inspect both car-navigation unit connector and wiring harness-side connector terminal H for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Inspect for vehicle speed signal input circuit. Repair or replace if necessary.
		No	**If the car-navigation unit connector is wrong:** • Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
8	**Note** • If the engine is started after the diagnostic function is activated, the diagnostic function mode is reset. • Turn the ignition switch to the ON position. • Start the diagnostic function. • Inspect the "GPS antenna" on diagnosis screen. • Is "OK" indicated?	Yes	Replace the car-navigation unit.
		No	Go to the next step.
9	• Turn the ignition switch to the LOCK position. • Remove the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.) • Inspect the connection of the car-navigation unit connector and GPS antenna connector. • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the GPS antenna connector (2-pin).
10	• Disconnect the GPS antenna connector. • Inspect both GPS antenna connector and car-navigation unit connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the wiring harness-side connector is wrong:** • Repair or replace the suspected wiring harness. **If the car-navigation unit side connector is wrong:** • Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
11	• Inspect the continuity between the car-navigation unit wiring harness-side connector terminal and the GPS antenna wiring harness side connector terminal. • Is there continuity?	Yes	Replace the car-navigation unit.
		No	Repair or replace the wiring harness.

NO.6 CAR-NAVIGATION CONTROL SWITCH IS INOPERATIVE.[CAR-NAVIGATION SYSTEM]

id0903e8802200

6	Car-navigation control switch is inoperative.
POSSIBLE CAUSE	• Car-navigation control switch malfunction • Open or short circuit in the wiring harness (remote control signal) • Poor connection of the car-navigation control switch connector, terminal damage • Poor connection of the LCD unit connector, terminal damage • LCD unit malfunction **Note** • The car-navigation control switch is inoperative if the following circuit has a malfunction — LCD unit connector (24-pin) terminal I (SI01)—car-navigation unit connector (24-pin) terminal N (SI01) — LCD unit connector (24-pin) terminal K (SI02)—car-navigation unit connector (24-pin) terminal P (SI02) • If the ignition switch is turned off, then ACC position while above circuits are malfunctioning, display screen changes to black.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Are the switches only partly inoperative?	Yes	Replace the car-navigation control switch. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	• Turn the ignition switch to the LOCK position. • Remove the car-navigation control switch. • Inspect the connection of the car-navigation control switch connector (6-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the car-navigation control switch connector (6-pin).
3	• Turn the ignition switch to the LOCK position. • Disconnect the car-navigation control switch connector (6-pin). • Inspect both the car-navigation control switch and wiring harness-side connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the car-navigation control switch side connector is wrong:** • Replace the car-navigation control switch. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
4	• Remove the LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.) • Inspect the LCD unit connector (6-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the LCD unit connector.
5	• Disconnect the LCD unit connector (6-pin). • Inspect both the LCD unit and wiring harness-side connector for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Connect the LCD unit connector, then go to the next step.
		No	**If the LCD unit side connector is wrong:** • Replace LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
6	• Turn the ignition switch to the LOCK position. • Disconnect the LCD unit connector (6-pin). • Disconnect the car-navigation control switch connector (16-pin). • Inspect for continuity between car-navigation control switch wiring harness-side connector terminal E and the LCD unit wiring harness-side connector terminal E. • Is there continuity?	Yes	Inspect for a short circuit in the wiring harness. If there is a short circuit, repair or replace the suspected wiring harness. If the wiring harness is normal, go to the next step.
		No	Repair or replace the suspected wiring harness.
7	• Connect the LCD unit connector (6-pin). • Turn the ignition switch to the ON position. • Inspect the voltage between the car-navigation control switch wiring harness-side connector terminal A (POWER) and B (P.ground). • Is the voltage **B+**?	Yes	Replace the car-navigation control switch.
		No	Go to the next step.

STEP	INSPECTION		ACTION
8	• Turn the ignition switch to the LOCK position. • Disconnect the LCD unit connector (6-pin). • Turn the ignition switch to the ON position. • Inspect the voltage between the car-navigation control switch harness-side connector (16-pin) terminal A (power) and body ground. • Is the voltage **B+**?	Yes	Inspect the car-navigation control switch wiring harness (power supply). Repair or replace if necessary.
		No	Replace the LCD unit.

NO.7 NO VOICE NAVIGATION[CAR-NAVIGATION SYSTEM]

id0903e8802300

7	**No voice navigation**
POSSIBLE CAUSE	• Improper adjustment of the NAVI voice volume • Car-navigation unit malfunction • Poor connection of the driver-side front door speaker connector, terminal damage • Driver-side front door speaker malfunction • Poor connection of the car-navigation unit connector, terminal damage • Open or short circuit in driver-side front door speaker wiring harness

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is the voice navigation volume from "1" to "7"?	Yes	Go to the next step.
		No	Adjust the volume from "1" to "7".
2	• Turn the audio power switch (CD, MD, radio) to ON. • Does the driver-side front door speaker work?	Yes	Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
		No	Go to the next step.
3	• Turn the ignition switch to the LOCK position. • Remove the driver-side front door speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.) • Inspect the connection of the driver-side front door speaker connector (2-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	• Securely connect the driver-side front door speaker connector
4	• Disconnect the driver-side front door speaker connector (2-pin). • Inspect both the driver-side front door speaker and wiring harness-side connector for poor connection (such as damaged/ pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the driver-side front door speaker side connector is wrong:** • Replace the driver-side front door speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
5	• Remove the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/ INSTALLATION.) • Inspect the connection of the car-navigation unit connector (16-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the car-navigation unit connector.
6	• Disconnect the car-navigation unit connector (16-pin). • Inspect both the car-navigation unit and wiring harness-side connector terminals M and N (without Bose) or I and K (with Bose) for poor connection (such as damaged/ pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the car-navigation unit side connector is wrong:** • Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong:** • Repair or replace the pins and/or the connector.
7	• Inspect for continuity between car-navigation unit and the driver-side front door speaker. • Is there continuity?	Yes	Inspect for a short circuit in the wiring harness. If there is a short circuit, repair or replace the suspected wiring harness. If the wiring harness is normal, go to the next step.
		No	Repair or replace the wiring harness.
8	• Inspect the driver-side front door speaker. (See 09-20-8 FRONT DOOR SPEAKER INSPECTION.) • Is it normal?	Yes	Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
		No	Replace the driver-side front door speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)

NO.8 DISPLAY SCREEN DOES NOT CHANGE TO THE NIGHT MODE. (FRONT AND REAR COMBINATION LIGHTS OPERATE NORMALLY.)[CAR-NAVIGATION SYSTEM]

id0903e8802400

8	**Display screen does not change to the night mode. (Front and rear combination lights operate normally.)**
POSSIBLE CAUSE	• Improper setting of NAVI map indication • Open or short circuit in TNS signal wiring harness (TNS signal related) • LCD unit malfunction • Poor connection of the LCD unit connector, terminal damage • car-navigation unit malfunction **Note** • The car-navigation control switch is inoperative if the following circuit has malfunction — LCD unit connector (24-pin) terminal I (SI01)—car-navigation unit connector (24-pin) terminal N (SI01) — LCD unit connector (24-pin) terminal K (SI02)—car-navigation unit connector (24-pin) terminal P (SI02) • If the ignition switch is turned off, then to the ACC position while the above circuits are malfunctioning, the display screen changes to black

Diagnostic procedure

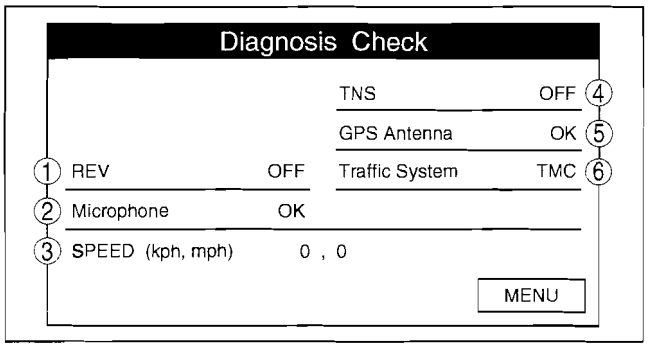
STEP	INSPECTION		ACTION
1	• Turn the ignition switch to the ACC position. • Does the display screen change to the night mode when the light switch is turned to the TNS position, and the dimmer cancel switch is turned off?	Yes	The system is normal.
		No	Go to the next step.
2	• Press the "MENU" button. • Select "Navigation Set Up". • Select "User Setting". • Inspect "MAP Mode". • Is the "MAP Mode" set to "Auto"?.	Yes	Go to the next step.
		No	System is normal. Set the "MAP Mode" to "Auto".
3	• Start the diagnostic function. • Turn the light switch to the TNS position. • Inspect the "TNS" on the diagnosis check screen. • Does the "TNS" indicate "ON"?	Yes	Replace the car-navigation unit. (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
		No	Go to the next step.
4	• Turn the ignition switch to the LOCK position. • Remove the LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.) • Inspect the connection of the LCD unit connector (24-pin). • Is the connector securely connected?	Yes	Go to the next step.
		No	Securely connect the LCD unit connector.
5	• Disconnect the LCD unit connector (24-pin). • Inspect both the LCD unit and wiring harness-side connector terminal V for poor connection (such as damaged/pulled-out pins, corrosion). • Are all the pins normal?	Yes	Go to the next step.
		No	**If the LCD unit side connector is wrong** • Replace the LCD unit. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.) **If the wiring harness-side connector is wrong** • Repair or replace the pins and/or the connector.
6	• Inspect the voltage of the LCD unit wiring harness-side connector (24-pin) terminal V (TNS signal). • Is the voltage **B+** when the light switch is turned to the TNS position?	Yes	Replace the LCD unit, then go to the next step. (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.)
		No	Inspect the TNS signal circuit. Repair or replace if necessary.
7	• Does system work properly?	Yes	Troubleshooting is completed.
		No	Replace the car-navigation unit.

REFERENCE INFORMATION[CAR-NAVIGATION SYSTEM]

id0903e8802600

Starting Procedure For Diagnostic Function

1. Turn the ignition switch to the ACC or ON position.
2. Press the MENU button.
3. Select "Navigation Set Up".
4. Select "Calibration".
5. Select "Map Version".
6. Press the joystick up **two times**, then down **two times**.
7. "Diagnosis Check" is displayed on the screen.
8. Select the "Diagnosis Check".



am3uuw0000016

No.	Display item	Description
1	REV	Indicate Reverse signal state. • ON: Reverse • OFF: Others
2	Microphone	Indicate the connection state of a microphone. • OK: Connect • NCON: Disconnect
3	Speed*	Indicate the present vehicle speed by kph/mph (a maximum of 3 digits).
4	TNS*	Indicate TNS signal state. • ON: Turn TNS ON • OFF: Turn TNS OFF
5	GPS Antenna*	Indicate the connection state of a GPS antenna. • OK: Connect • NCON: Disconnect
6	Traffic System	Indicate the RDS-TMC system availability on the vehicle. • None: Not equip.

* : It is used for symptom troubleshooting. (Troubleshooting index No. 5 and No. 8)

Finishing Procedure For Diagnostic Function

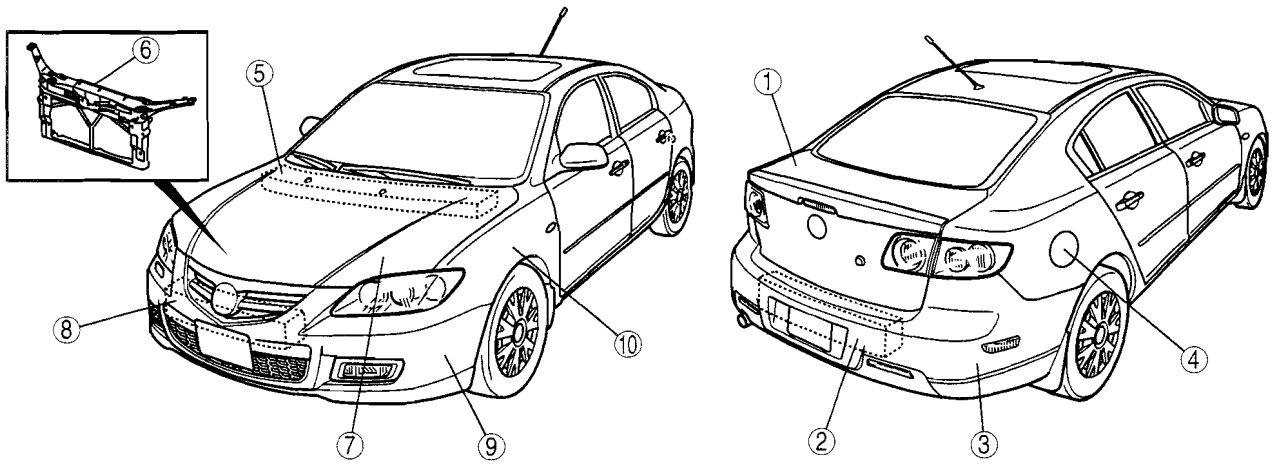
1. Turn the ignition switch to the LOCK position.
2. Turn the ignition switch to the ACC or ON position.
3. Return to the normal screen.

09-10 BODY PANELS

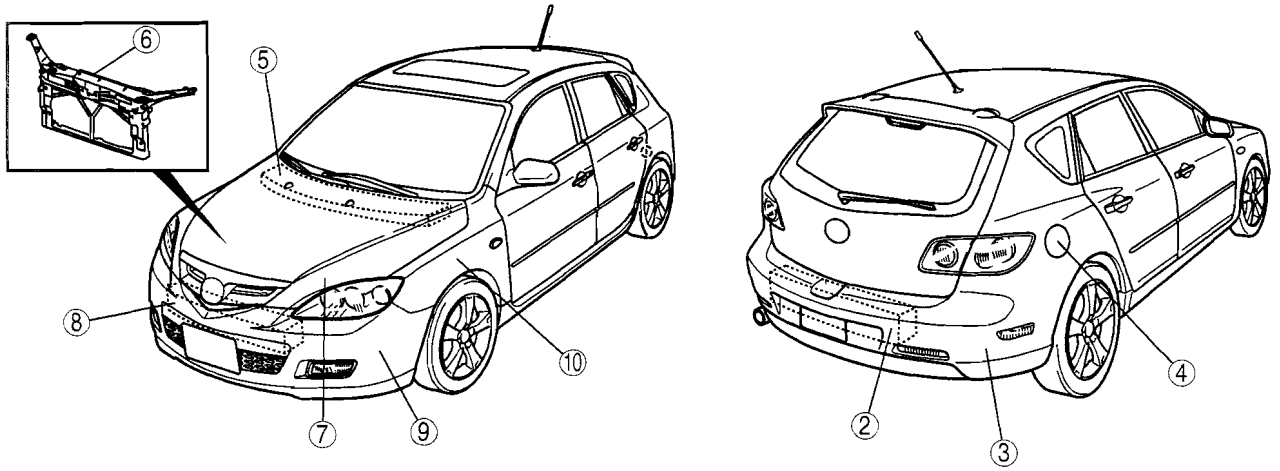
BODY PANELS LOCATION INDEX

id091000802600

4 DOOR



5 DOOR



am3uuw0000046

1	Trunk lid (See 09-10-6 TRUNK LID REMOVAL/ INSTALLATION.) (See 09-10-7 TRUNK LID ADJUSTMENT.) (See 09-10-7 TRUNK LID STAY DAMPER DISPOSAL.)
2	Rear bumper reinforcement (See 09-10-20 REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION.)
3	Rear bumper (See 09-10-15 REAR BUMPER REMOVAL/ INSTALLATION.)
4	Fuel-filler lid (See 09-10-7 FUEL-FILLER LID REMOVAL/ INSTALLATION.) (See 09-10-8 FUEL-FILLER LID ADJUSTMENT.)
5	Cowl panel (See 09-10-20 COWL PANEL REMOVAL/ INSTALLATION.)

6	Shroud panel (See 09-10-21 SHROUD PANEL REMOVAL/ INSTALLATION.)
7	Hood (See 09-10-3 HOOD REMOVAL/INSTALLATION.) (See 09-10-4 HOOD ADJUSTMENT.)
8	Front bumper reinforcement (See 09-10-18 FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION.)
9	Front bumper (See 09-10-8 FRONT BUMPER REMOVAL/ INSTALLATION.) (See 09-10-11 FRONT BUMPER DISASSEMBLY/ ASSEMBLY.)
10	Front fender panel (See 09-10-21 FRONT FENDER PANEL REMOVAL/INSTALLATION.)

HOOD REMOVAL/INSTALLATION

id091000801200

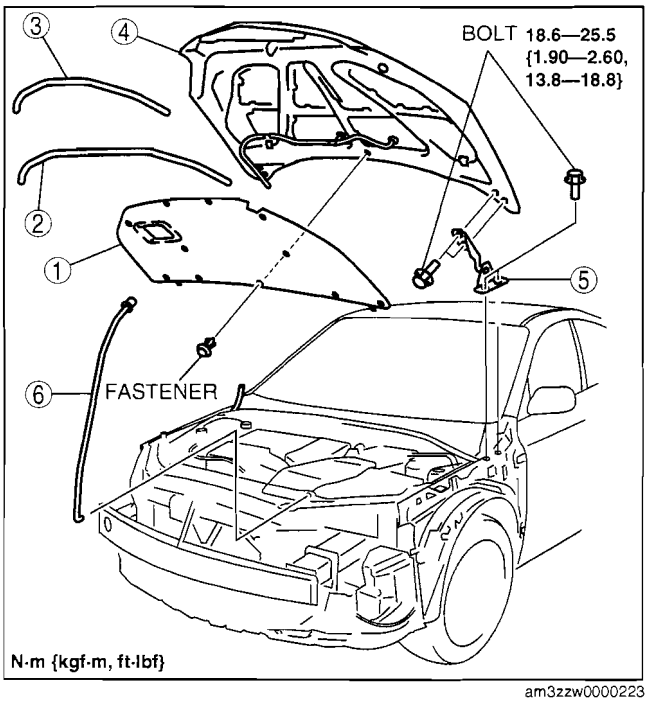
Warning

- **Removing the hood without proper support can be dangerous. The hood may fall and injure you. Always perform the following procedure with at least another person.**

1. To remove the hood hinge, remove the following parts:
   (1) Front side turn lights (See09-18-14 FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION.)
   (2) Front bumper (See09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
   (3) Front combination lights (See09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (4) Front fender panel (See09-10-21 FRONT FENDER PANEL REMOVAL/INSTALLATION.)
   (5) Charge air cooler duct (Mazdaspeed3) (See01-13B-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[L3 WITH TC].)
2. Disconnect the windshield washer hose.
3. Remove in the order indicated in the table.

1	Hood insulator
2	Shroud seal weatherstrip
3	Parting seal weatherstrip (4 door) (Mazdaspeed3)
4	Hood
5	Hood hinge
6	Hood stay

4. Install in the reverse order of removal.
5. Adjust the hood. (See09-10-4 HOOD ADJUSTMENT.)



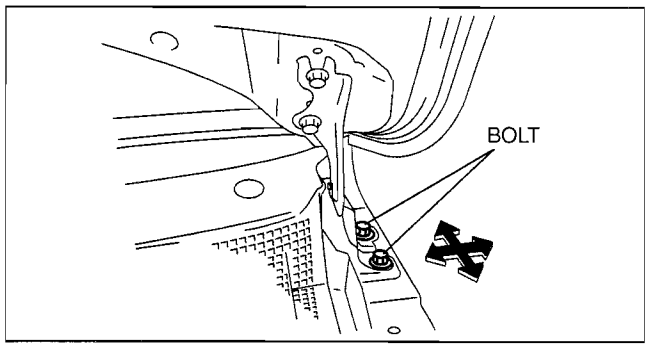
am3zzw0000223

HOOD ADJUSTMENT

id091000801400

Gap Adjustment

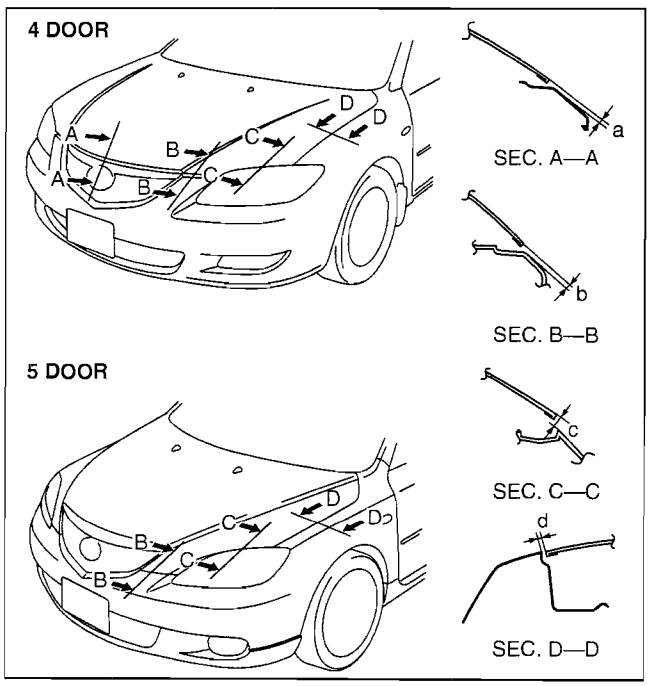
1. Remove the following parts:
   (1) Front side turn lights (See09-18-14 FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION.)
   (2) Front bumper (See09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
   (3) Front combination lights (See09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (4) Front fender panel (See09-10-21 FRONT FENDER PANEL REMOVAL/INSTALLATION.)
2. Loosen the hood hinge installation bolts and adjust the hood.
3. Tighten the bolts.



am3uuw0000045

4. Verify that the gap between the hood and the body is within the specification.

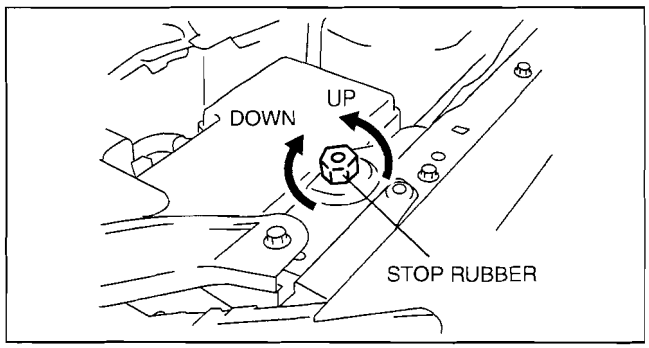
Standard clearance
a: 0.2—3.8 mm {0.0079—0.14 in}
b: −1.0—3.0 mm {−0.039—0.11 in} (4 door)
b: −1.5—2.5 mm {−0.059—0.098 in} (5 door)
c: −0.5—2.5 mm {−0.019—0.098 in} (4 door)
c: −1.0—2.0 mm {−0.039—0.078 in} (5 door)
d: 2.5—4.5 mm {0.10—0.17 in}



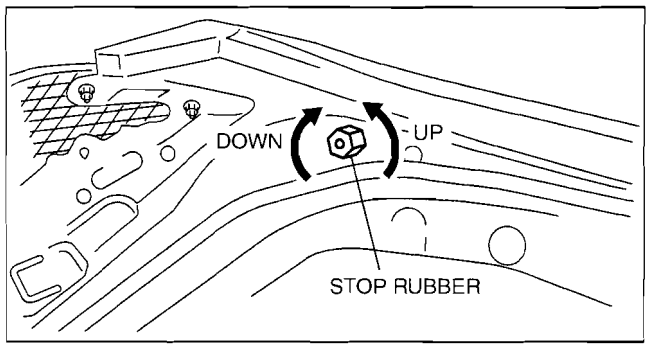
c3u0910w104

Height Difference Adjustment

1. Turn the stop rubber to adjust the height of the hood.

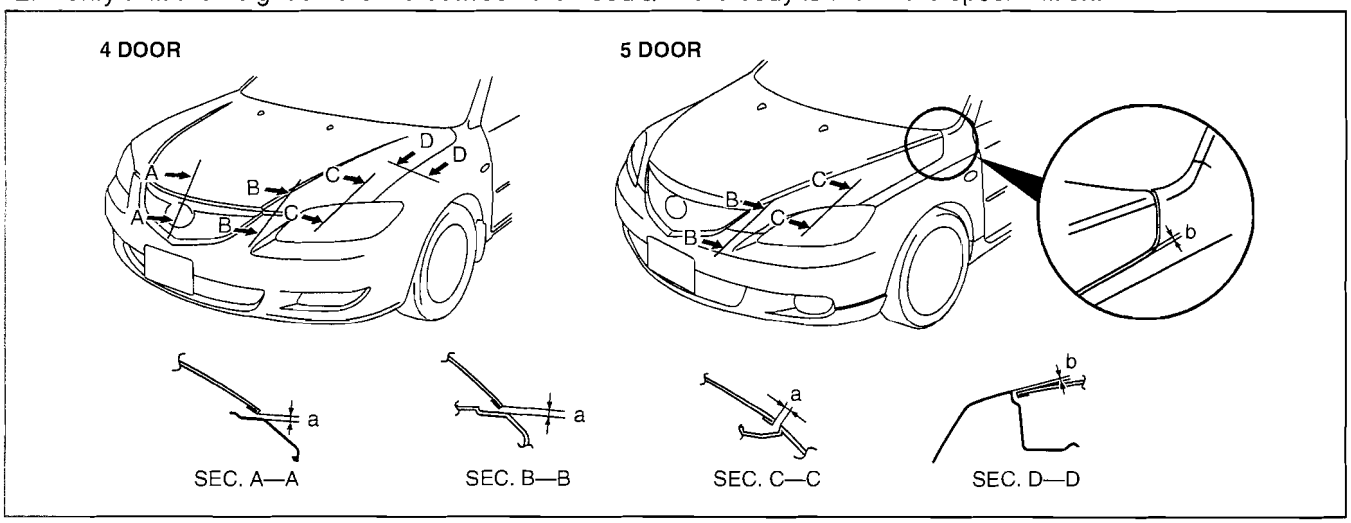


am3uuw0000046



am3uuw0000046

2. Verify that the height difference between the hood and the body is within the specification.



c3u0910w106

Standard clearance

a: 3.0—6.0 mm {0.12—0.23 in}

b: −1.5—0.5 mm {−0.059—0.019 in}

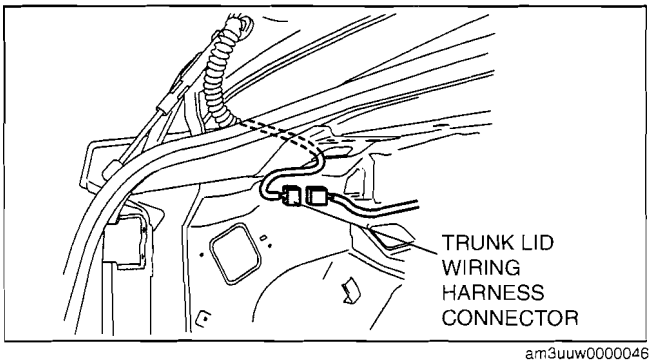
TRUNK LID REMOVAL/INSTALLATION

id091000801600

Warning

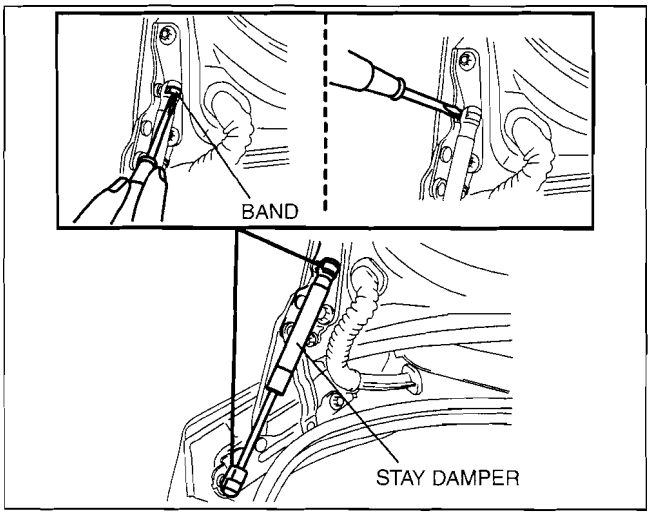
- **Removing the stay damper without supporting the trunk lid can be dangerous. The trunk lid may fall and injure you. Be sure to open the trunk lid completely and support it securely before removing the stay damper.**

1. Disconnect the negative battery cable.
2. Remove the trunk end trim. (See09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
3. Remove the trunk side trim (LH). (See09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
4. Disconnect the trunk lid wiring harness connector, then take the trunk lid wiring harness out from the vehicle.



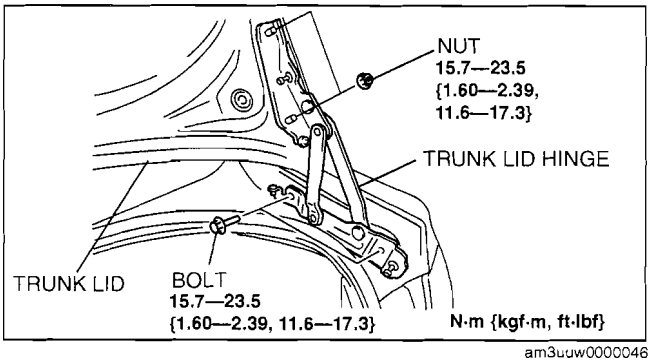
am3uuw0000046

5. Pry off the stay damper band using a flathead screwdriver.
6. Pry out the connecting parts of the stay damper out of the hinge with a flathead screwdriver, then remove the stay damper.



am3uuw0000046

7. Remove the nuts, then remove the trunk lid.
8. Remove the bolts, then remove the trunk lid hinge.
9. Install in the reverse order of removal.
10. Adjust the trunk lid. (See09-10-7 TRUNK LID ADJUSTMENT.)



am3uuw0000046

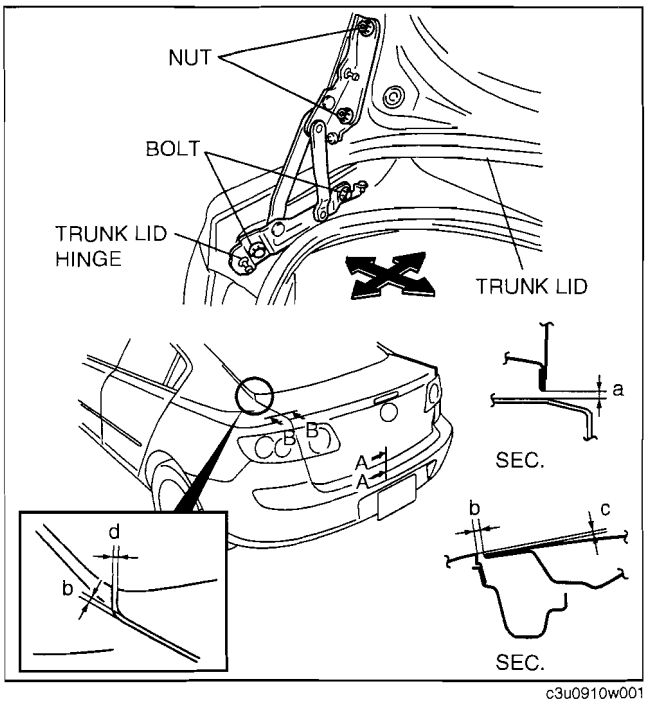
TRUNK LID ADJUSTMENT

id091000801700

1. Measure the gap and height difference between the trunk lid and the body.
2. Loosen the trunk lid hinge installation bolts or nuts and adjust the trunk lid.
   - If necessary, loosen the trunk lid lock striker installation bolts and adjust the trunk lid. (See09-14-29 TRUNK LID LOCK STRIKER REMOVAL/INSTALLATION.)

   Standard clearance
   a: 4.0—8.0 mm {0.16—0.31 in}
   b: 2.5—4.5 mm {0.10—0.17 in}
   c: −0.5—1.5 mm {−0.019—0.059 in}
   d: 3.3—5.3 mm {0.13—0.20 in}

3. Tighten the bolts or nuts.



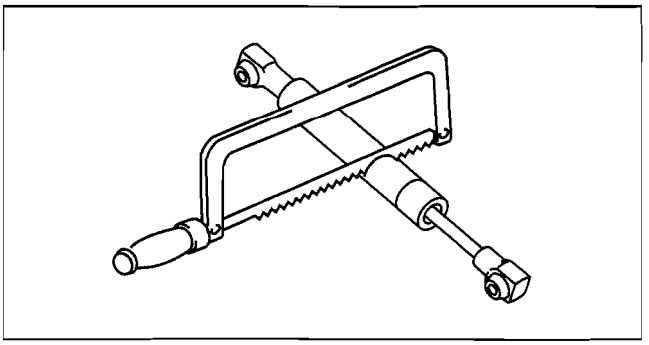
c3u0910w001

TRUNK LID STAY DAMPER DISPOSAL

id091000802700

Note
- The gas in the stay damper is colorless, odorless, and non-toxic.

1. Wear protective eye wear.
2. Lay the stay damper flat.
3. Saw **2—3 mm {0.08—0.11 in}** into the stay damper using a hacksaw, and allow the gas to escape from the stay damper.
4. Verify that the gas has escaped from the stay damper.
5. Discard the stay damper.

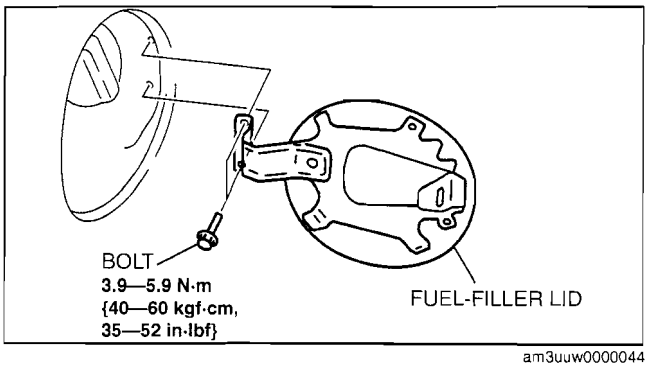


B6U0910W018

FUEL-FILLER LID REMOVAL/INSTALLATION

id091000800100

1. Remove the bolts.
2. Remove the fuel-filler lid.
3. Install in the reverse order of removal.
4. Adjust the fuel-filler lid. (See09-10-8 FUEL-FILLER LID ADJUSTMENT.)



am3uuw0000044

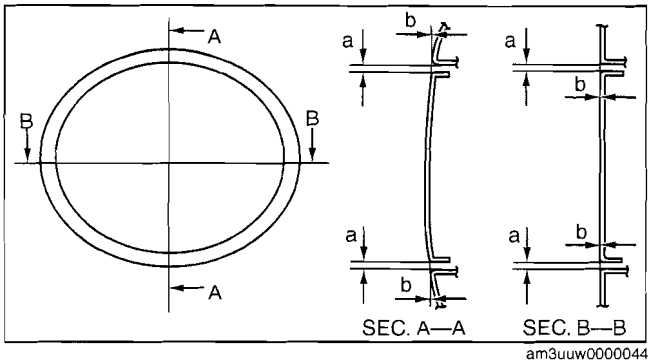
FUEL-FILLER LID ADJUSTMENT

id091000800200

1. Measure the gap and height difference between the fuel-filler lid and the body.
2. Loosen the fuel-filler lid installation bolts, and adjust the fuel-filler lid.

   Standard clearance
   a: 1.7—3.7 mm {0.067—0.14 in}
   b: –0.5—1.5 mm {–0.019—0.059 in}

3. Tighten the bolts.



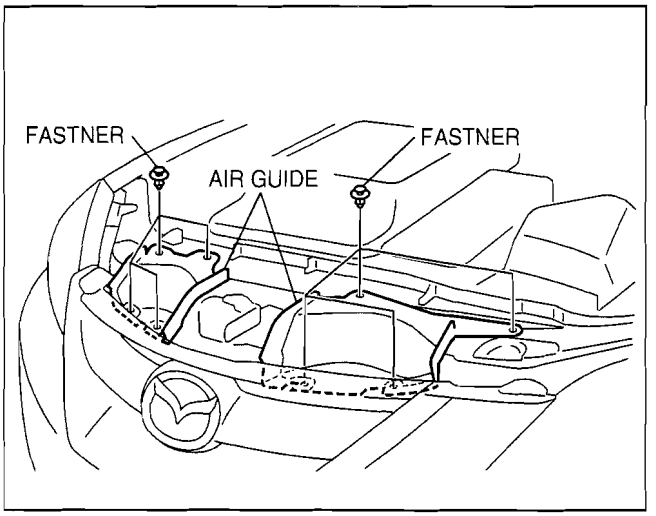
am3uuw0000044

FRONT BUMPER REMOVAL/INSTALLATION

id091000800300

4 DOOR/Mazdaspeed3

1. Disconnect the negative battery cable.
2. Remove the fastener, then remove the air guide. (Mazdaspeed3)

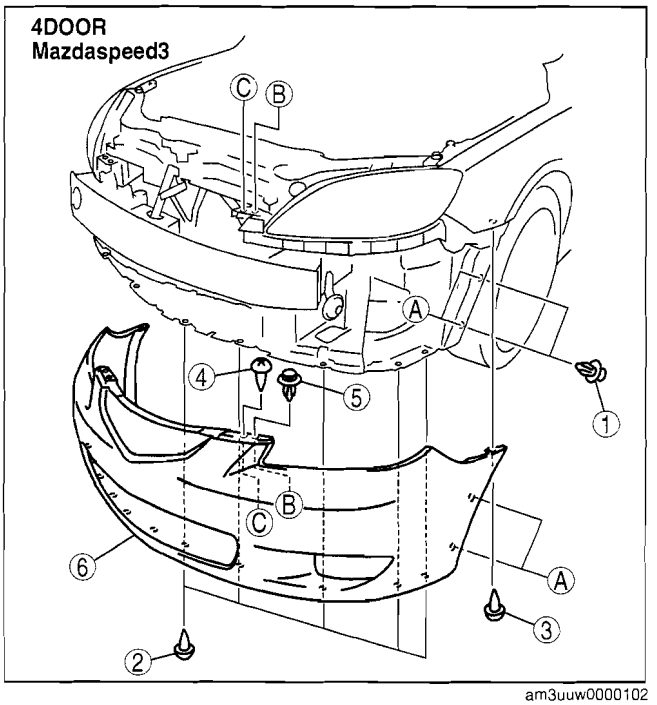


am3uuw0000044

3. Remove in the order indicated in the table.

1	Fastener A
2	Screw A
3	Screw B
4	Screw C
5	Fastener B
6	Front bumper (See 09-10-10 Front Bumper Removal Note.) (See 09-10-10 Front Bumper Installation Note.)

4. Disconnect the ambient temperature sensor connector.
5. Disconnect the front fog light connectors for vehicles with the front fog lights.
6. Install in the reverse order of removal.
7. Adjust the front fog light aiming for vehicles with the front fog lights. (See 09-18-13 FRONT FOG LIGHT AIMING.)



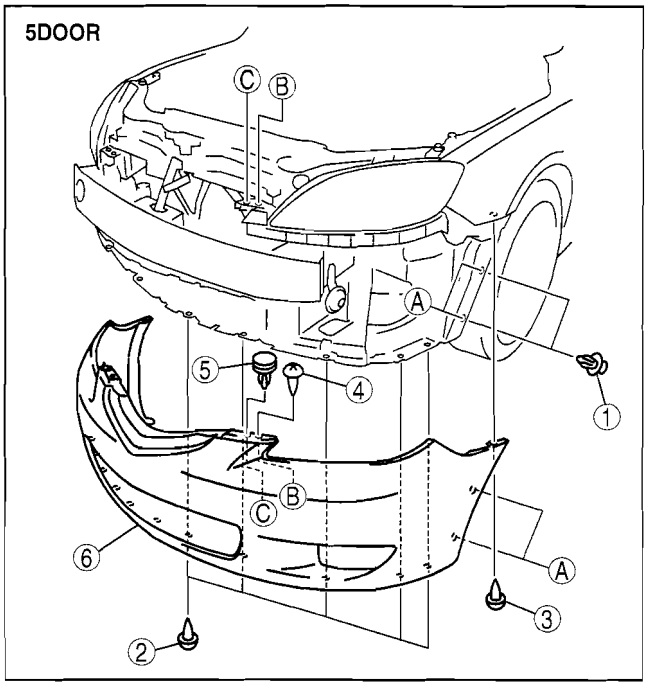
am3uuw0000102

5 DOOR

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Fastener A
2	Screw A
3	Screw B
4	Screw C
5	Fastener B (See 09-10-9 Fastener B Removal Note (5 DOOR).)
6	Front bumper (See 09-10-10 Front Bumper Removal Note.) (See 09-10-10 Front Bumper Installation Note.)

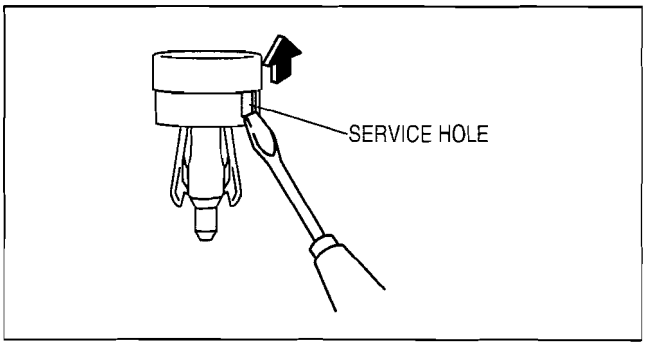
3. Disconnect the front fog light connector.
4. Install in the reverse order of removal.
5. Adjust the front fog light aiming for vehicles with the front fog lights. (See 09-18-13 FRONT FOG LIGHT AIMING.)



am3uuw0000102

Fastener B Removal Note (5 DOOR)

1. Remove fastener B by inserting a small flathead screwdriver into the service hole as shown in the figure.



am3zzw0000221

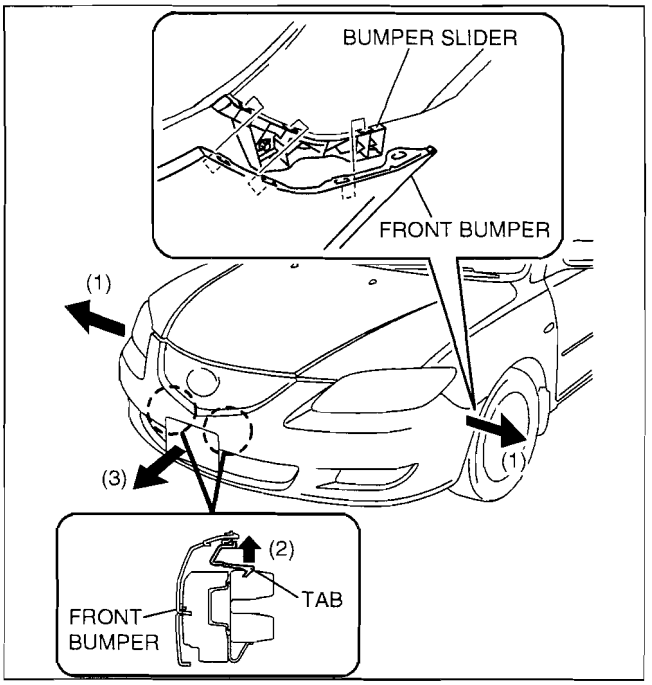
Front Bumper Removal Note

1. Pull the front bumper ends (wheel arch) outward to detach from the bumper slider.

Caution

- **When detaching the front bumper from the bumper slider, the front bumper could fall and be damaged. Secure the front bumper so that it does not fall.**

2. Pull the tabs in the direction of the arrow.
3. Remove the front bumper from the body.



am3uuw0000044

Front Bumper Installation Note

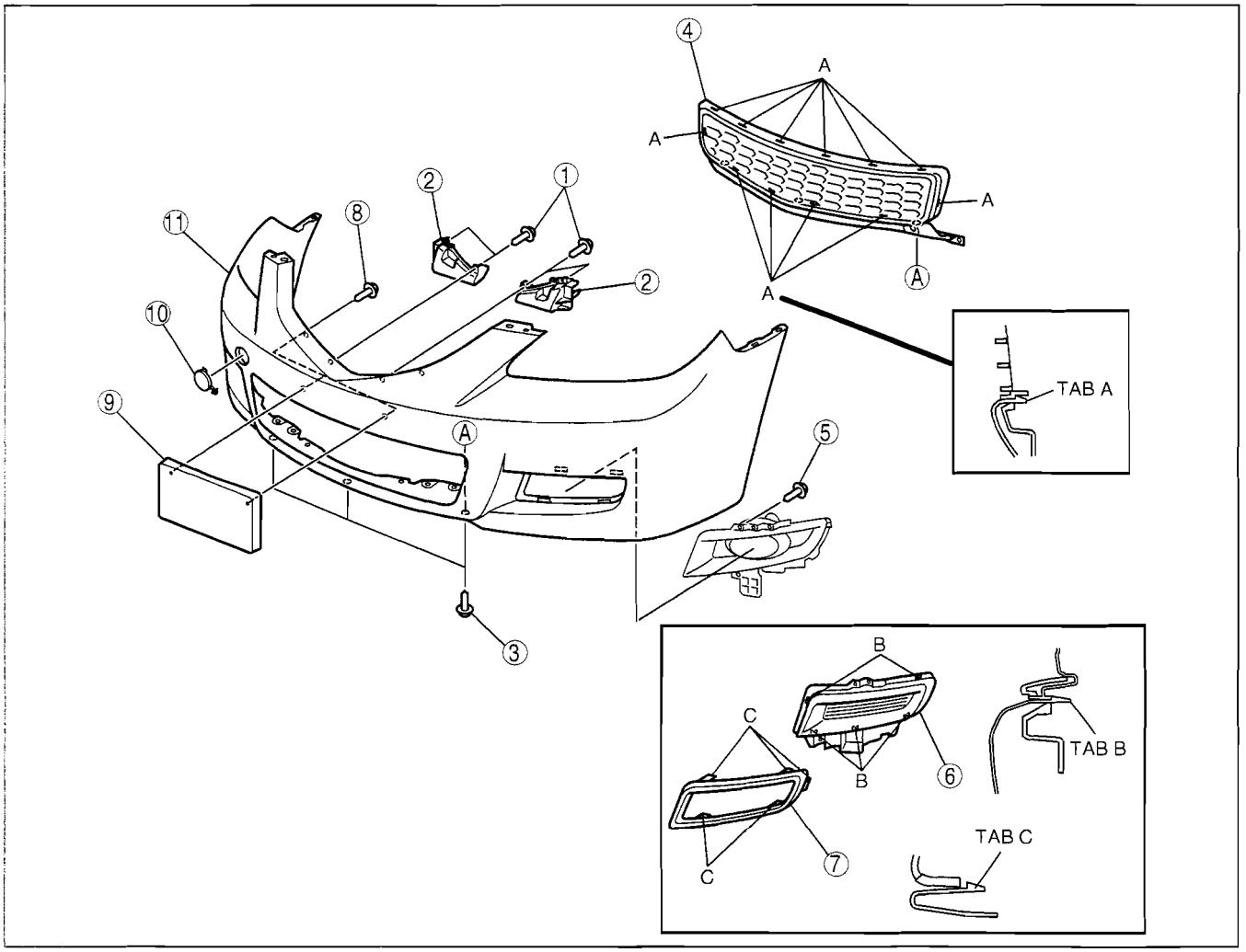
1. Spread the front bumper ends apart.
2. Attach the front bumper to the body.
3. Press the front bumper connecting area into the body to engage with the bumper slider.

FRONT BUMPER DISASSEMBLY/ASSEMBLY

id091000800400

4 DOOR/Standard Type

1. Remove the following parts:
   (1) Front fog lights (Vehicles with the front fog lights) (See 09-18-11 FRONT FOG LIGHT REMOVAL/INSTALLATION.)
   (2) Radiator grille (See 09-16-5 RADIATOR GRILLE REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.



am3uuw0000044

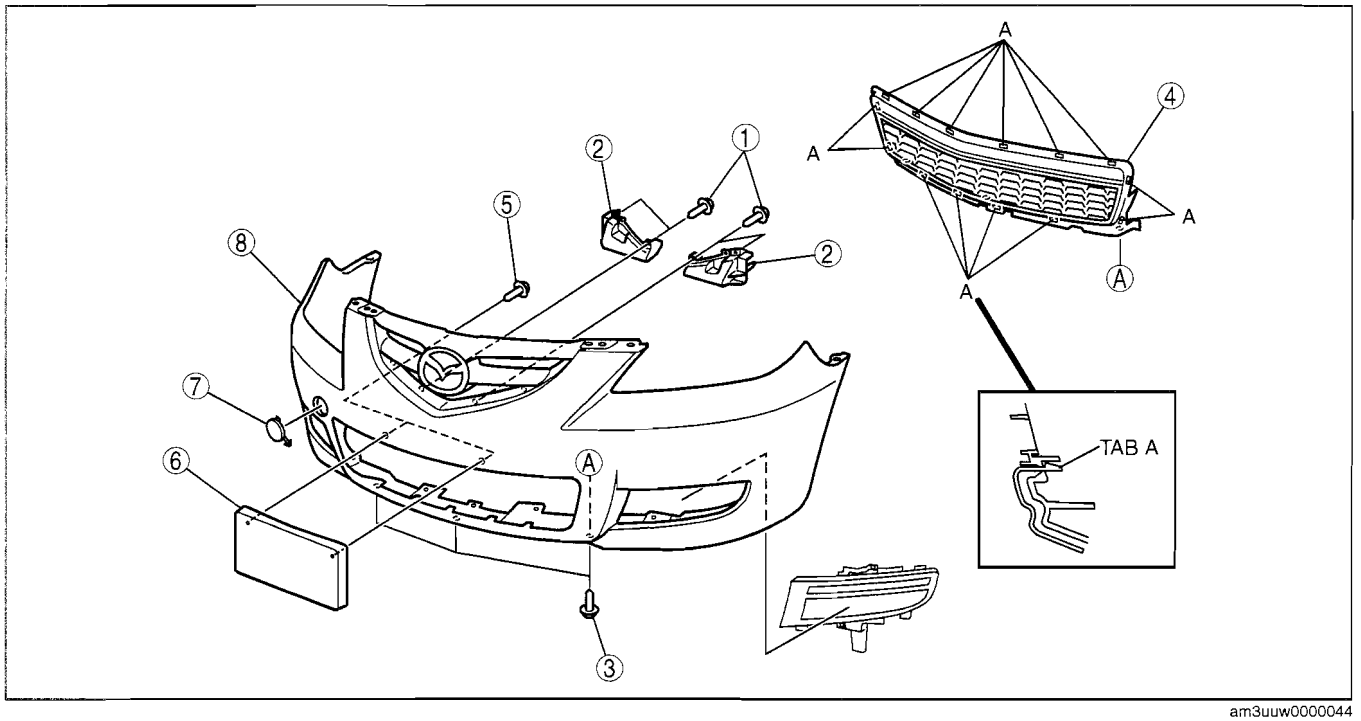
1	Screw A
2	Set plate
3	Screw B
4	Front bumper mesh
5	Screw C
6	Front fog light hole cover A (vehicles without the front fog lights)

7	Front fog light hole cover B (vehicles with the front fog lights)
8	Screw D
9	License plate holder
10	Towing hook cover
11	Front bumper fascia

3. Assemble in the reverse order of disassembly.

4 DOOR/Sports Type

1. Remove the following parts:
   (1) Front fog lights (See 09-18-11 FRONT FOG LIGHT REMOVAL/INSTALLATION.)
   (2) Radiator grille (See 09-16-5 RADIATOR GRILLE REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.



am3uuw0000044

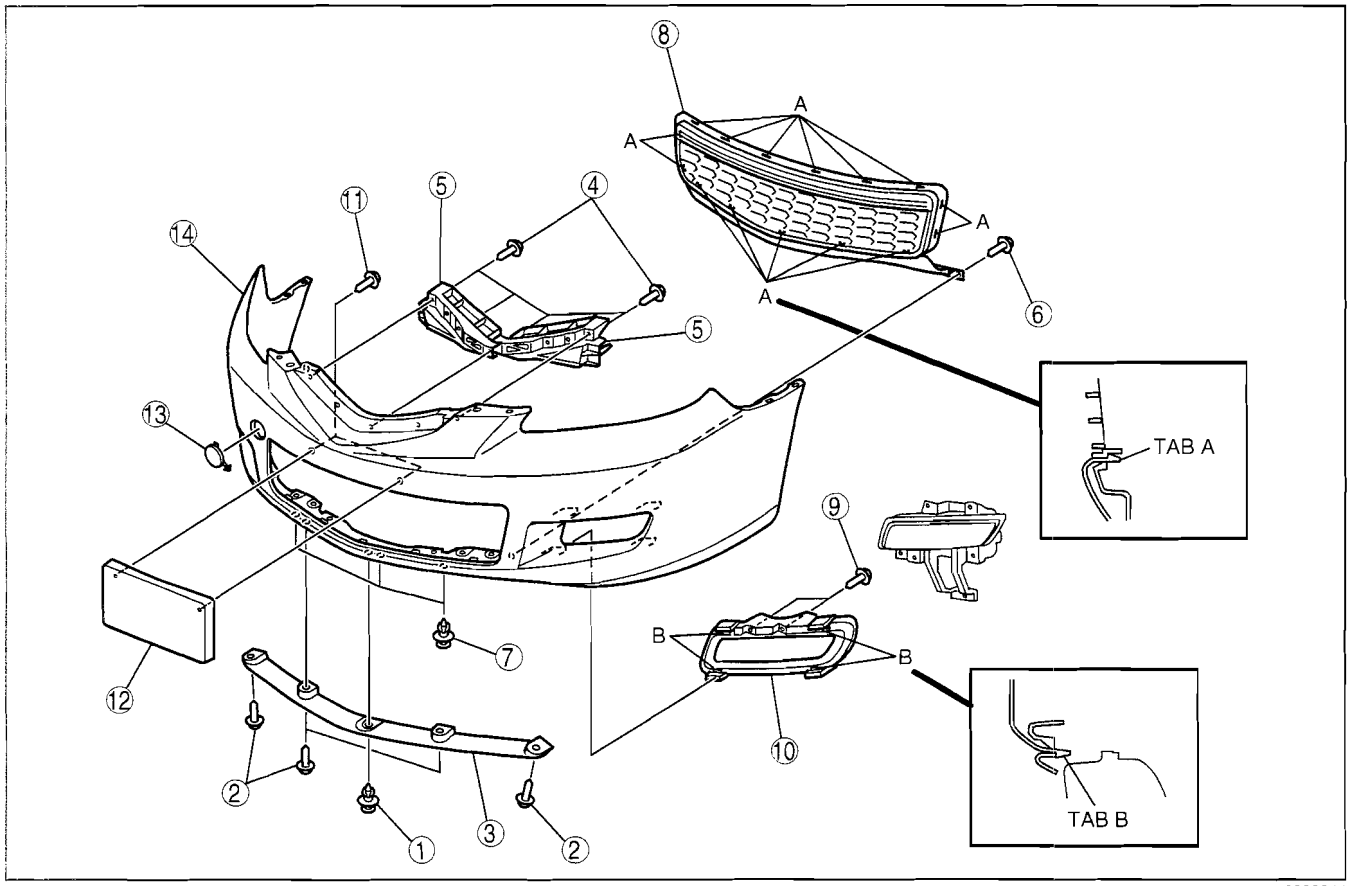
1	Screw A
2	Set plate
3	Screw B
4	Front bumper mesh

5	Screw C
6	License plate holder
7	Towing hook cover
8	Front bumper fascia

3. Assemble in the reverse order of disassembly.

5 DOOR

1. Remove the Front fog light (See 09-18-11 FRONT FOG LIGHT REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.



am3uuw0000044

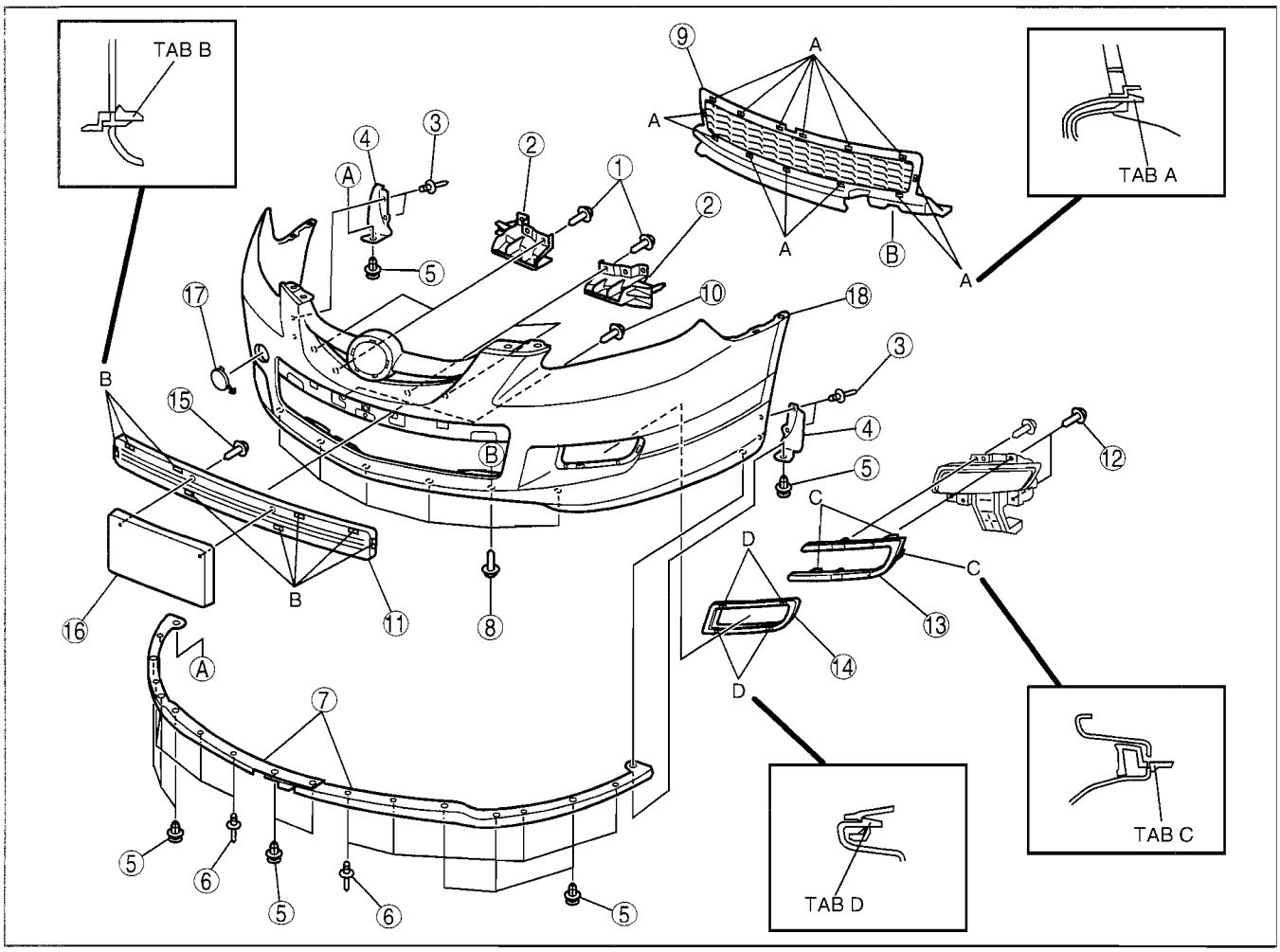
1	Fastener A
2	Screw A
3	Airdam skirt
4	Screw B
5	Set plate
6	Screw C
7	Fastener B

8	Front bumper mesh
9	Screw D
10	Front fog light hole cover
11	Screw E
12	License plate holder
13	Towing hook cover
14	Front bumper fascia

3. Assemble in the reverse order of disassembly.

Mazdaspeed3

1. Remove the following parts:
   (1) Front fog lights (See 09-18-11 FRONT FOG LIGHT REMOVAL/INSTALLATION.)
   (2) Radiator grille (See 09-16-5 RADIATOR GRILLE REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.



am3uuw0000044

1	Screw A
2	Set plate
3	Rivet A
4	Front bumper deflector
5	Fastener
6	Rivet B
7	Airdam skirt
8	Screw B
9	Front bumper mesh

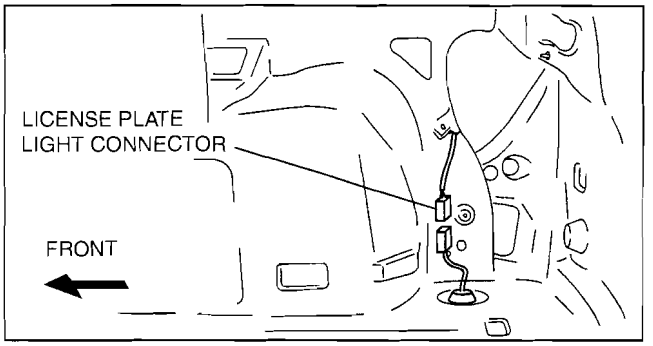
10	Screw C
11	Front bumper protector
12	Screw D
13	Front fog light hole cover A
14	Front fog light hole cover B
15	Screw E
16	License plate holder
17	Towing hook cover
18	Front bumper fascia

3. Assemble in the reverse order of disassembly.

REAR BUMPER REMOVAL/INSTALLATION

id091000800700

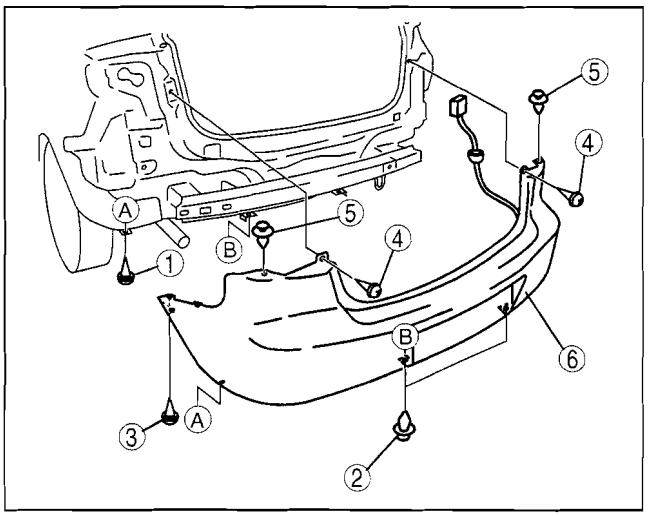
1. Disconnect the negative battery cable.
2. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
3. Remove the fasteners and slightly bend back the trunk side trim (RH).
4. Remove the fasteners and slightly bend back the trim (LH). (4 DOOR)
5. Remove the service hole cover (LH). (5 DOOR)
6. Remove the rear combination light. (See 09-18-14 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.)
7. Disconnect the license plate light connector.



am3uuw0000045

8. Remove in the order indicated in the table.

1	Screw A
2	Fastener A
3	Screw B
4	Screw C
5	Fastener B
6	Rear bumper (See 09-10-15 Rear Bumper Removal Note.) (See 09-10-15 Rear Bumper Installation Note.)



am3uuw0000045

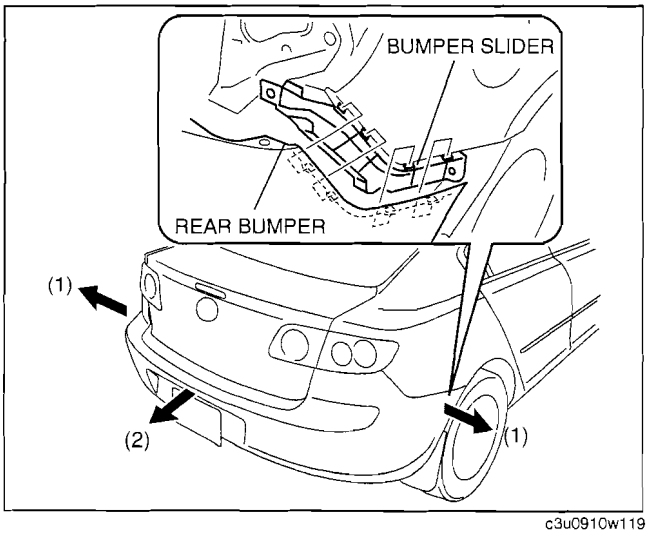
9. Install in the reverse order of removal.

Rear Bumper Removal Note

1. Pull the rear bumper ends (wheel arch) outward to detach from the bumper slider.

Caution

- **When detaching the rear bumper from the bumper slider, the rear bumper could fall and be damaged. Secure the rear bumper so that it does not fall.**



c3u0910w119

Rear Bumper Installation Note

1. Spread the rear bumper ends (wheel arches) apart.
2. Attach the rear bumper to the body.
3. Press the rear bumper connecting area into the body to engage with the bumper slider.

REAR BUMPER DISASSEMBLY/ASSEMBLY

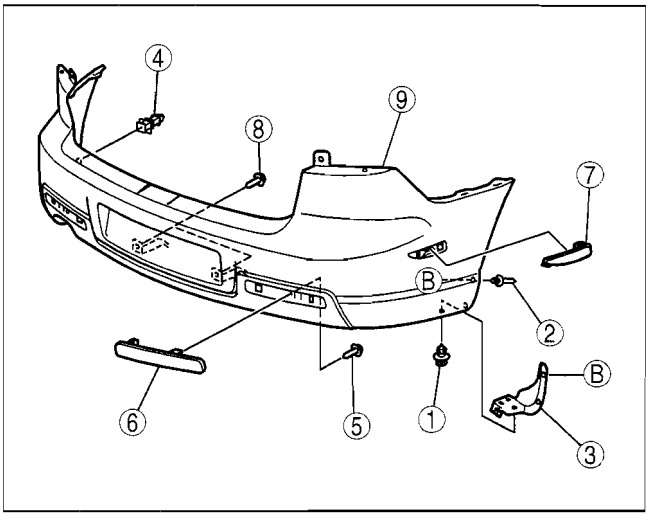
id091000800800

4 DOOR

1. Remove the License plate lights. (See 09-18-17 LICENSE PLATE LIGHT REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.

1	Fastener
2	Rivet
3	Splash shield
4	Locator pin
5	Screw A
6	Reflector A (See 09-10-17 Reflector Removal Note.)
7	Reflector B (See 09-10-17 Reflector Removal Note.)
8	Screw B
9	Rear bumper fascia

3. Assemble in the reverse order of disassembly.



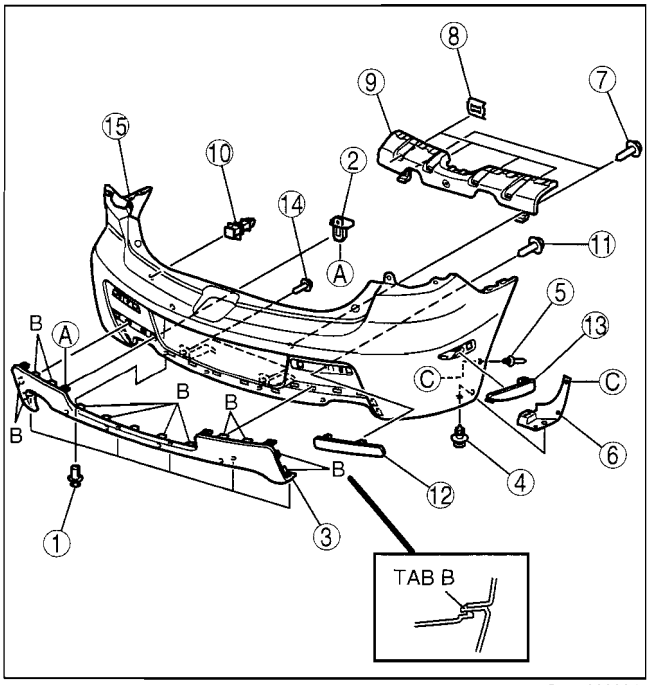
am3zzw0000228

5 DOOR

1. Remove the License plate lights. (See 09-18-17 LICENSE PLATE LIGHT REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.

1	Fastener A
2	Clip A
3	Rear bumper fascia lower
4	Fastener B
5	Rivet
6	Splash shield
7	Screw A
8	Clip B
9	Rear bumper retainer
10	Locator pin
11	Screw B
12	Reflector A (See 09-10-17 Reflector Removal Note.)
13	Reflector B (See 09-10-17 Reflector Removal Note.)
14	Screw C
15	Rear bumper fascia

3. Assemble in the reverse order of disassembly.

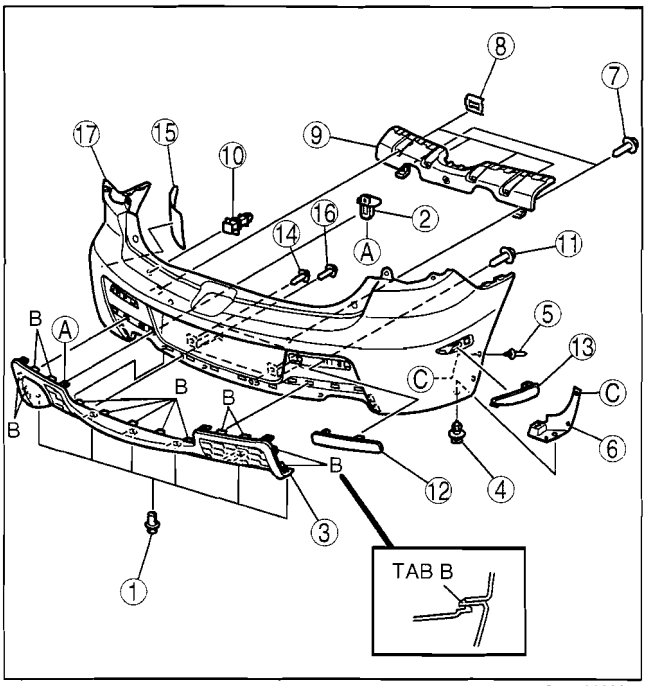


am3uuw0000045

Mazdaspeed3

1. Remove the License plate lights. (See 09-18-17 LICENSE PLATE LIGHT REMOVAL/INSTALLATION.)
2. Disassemble in the order indicated in the table.

1	Fastener A
2	Clip A
3	Rear bumper fascia lower
4	Fastener B
5	Rivet
6	Splash shield
7	Screw A
8	Clip B
9	Rear bumper retainer
10	Locator pin
11	Screw B
12	Reflector A (See 09-10-17 Reflector Removal Note.)
13	Reflector B (See 09-10-17 Reflector Removal Note.)
14	Screw C
15	Insulator
16	Screw D
17	Rear bumper fascia

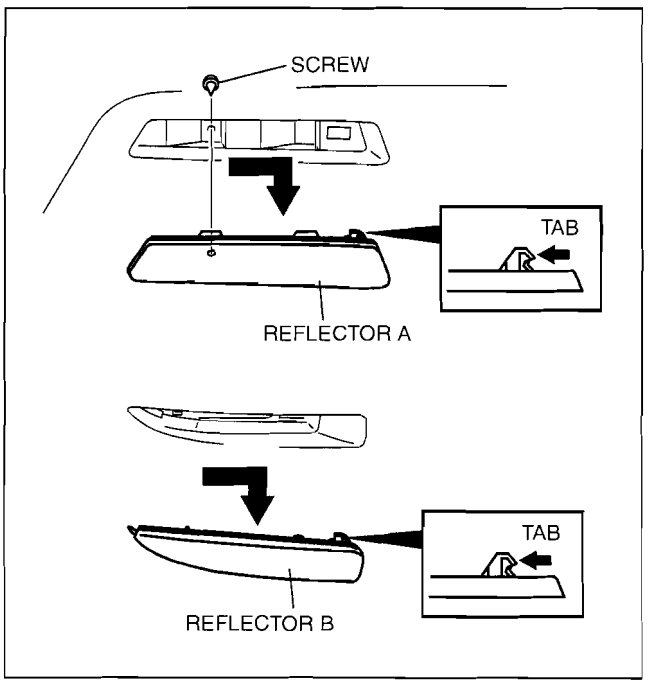


am3uuw0000045

3. Assemble in the reverse order of disassembly.

Reflector Removal Note

1. Remove the screws.
2. Lift the reflector up in the direction of the arrow, then unhook it from the rear bumper.



am3uuw0000074

FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION

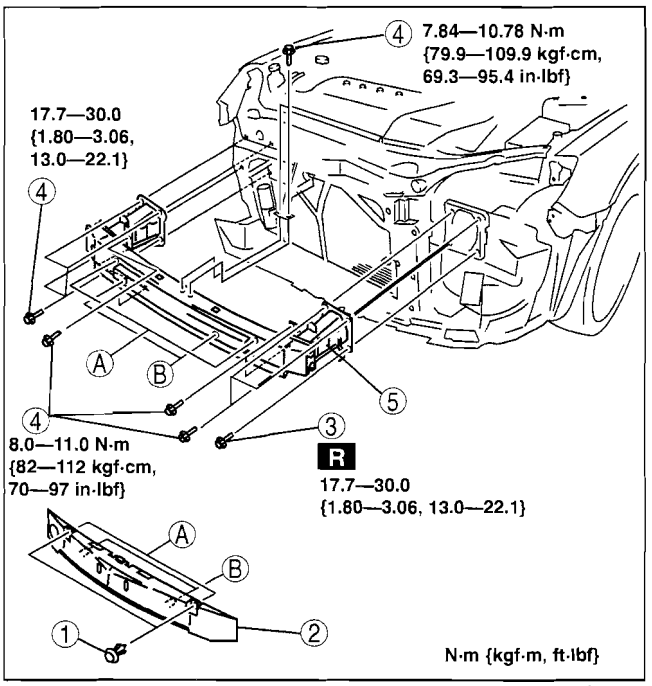
id091000800600

1. Remove the front bumper. (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
2. Remove the front combination light. (See 09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
3. Remove the horn. (See 09-22-12 HORN REMOVAL/INSTALLATION.)
4. Set the following parts out of the way:
   (1) Under cover
   (2) Electric power steering oil pump
   (3) Washer tank
5. Remove in the order indicated in the table.

Caution

- **If bolt A (only one location on the lower left) is removed, always replace it with the specialized replacement part (Part No. BPYK 50 0Z2) to ensure proper horn ground connection.**

1	Fastener
2	Energy-absorbing foam
3	Bolt A
4	Bolt B
5	Front bumper reinforcement (See 09-10-18 Front Bumper Reinforcement Installation Note.)



am3uuw0000045

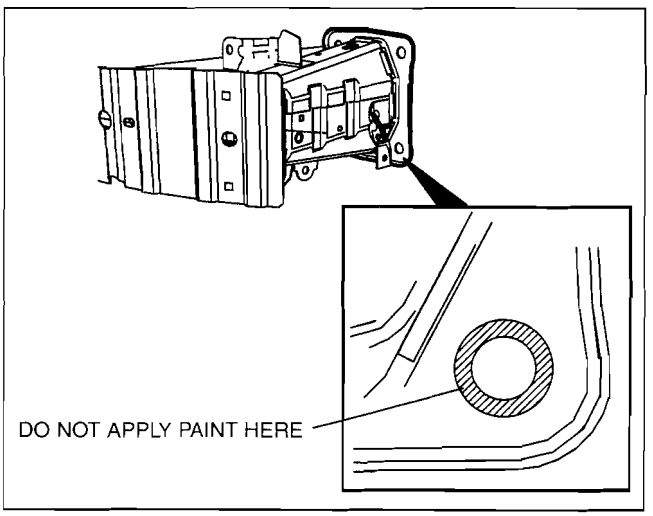
6. Install in the reverse order of removal.
7. After installation, verify that the horn functions normally.

Front Bumper Reinforcement Installation Note

Reusing The Front Bumper Reinforcement

Caution

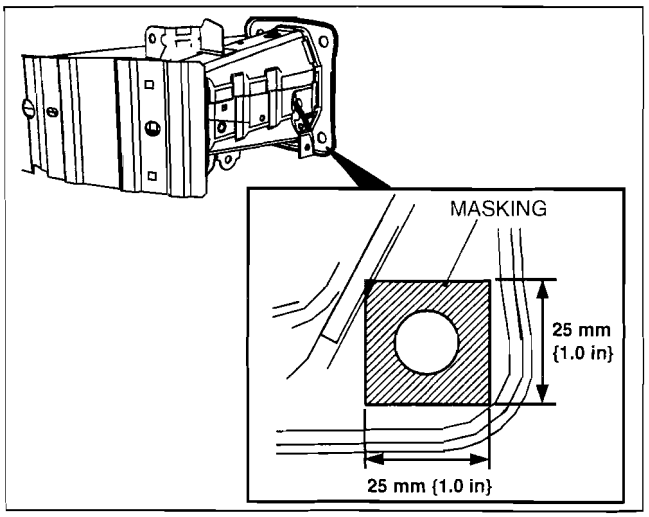
- **In order to ensure proper body ground connection, do not apply paint in the area where the bolt A flange contacts the front bumper reinforcement.**



am3uuw0000045

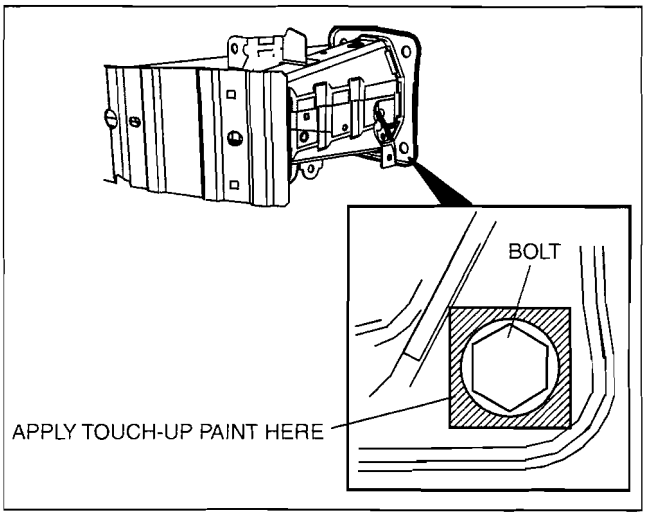
Installing A New Front Bumper Reinforcement

1. Remove the masking tape from the front bumper reinforcement.
   - If the masking tape has already peeled off, scrape off any rust or paint residue from the masked area.



am3uuw0000045

2. After installing bolt A, apply touch-up paint to the area of the front bumper reinforcement that has remained unpainted.

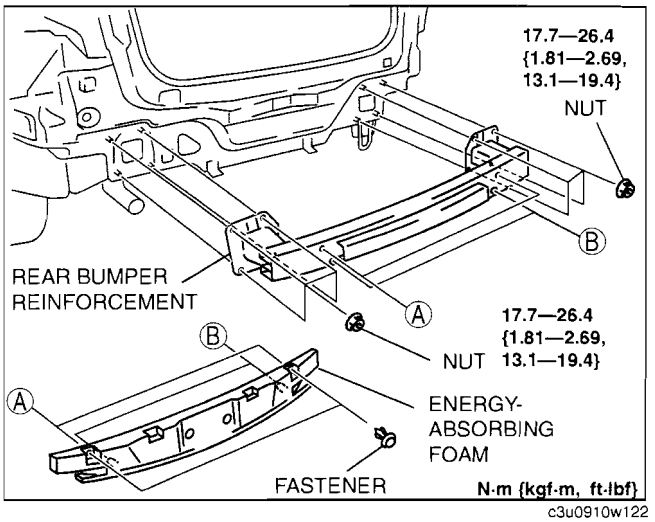


am3uuw0000045

REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION

id091000800900

1. Remove the following parts:
   (1) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (2) Trunk side trim (4 door) (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Trunk side trim (RH) (5 door) (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Service hole cover (LH) (5 door)
   (5) Rear combination lights (See 09-18-14 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (6) Rear bumper (See 09-10-15 REAR BUMPER REMOVAL/INSTALLATION.)
2. Remove the fasteners, then remove the energy absorbing foam.
3. Remove the nuts, then remove the rear bumper reinforcement.
4. Install in the reverse order of removal.

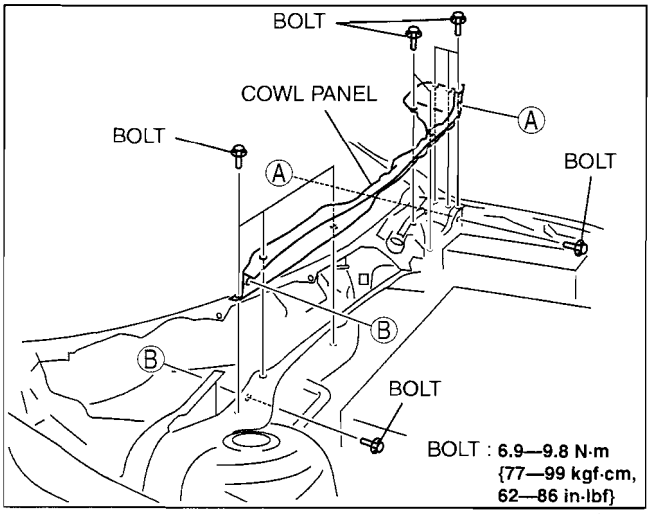


c3u0910w122

COWL PANEL REMOVAL/INSTALLATION

id091000802000

1. Remove the windshield wiper arm and blade. (See09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Remove the cowl grille. (See09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
3. Remove the bolts, then remove the cowl panel.
4. install in the reverse order of removal.



am3uuw0000046

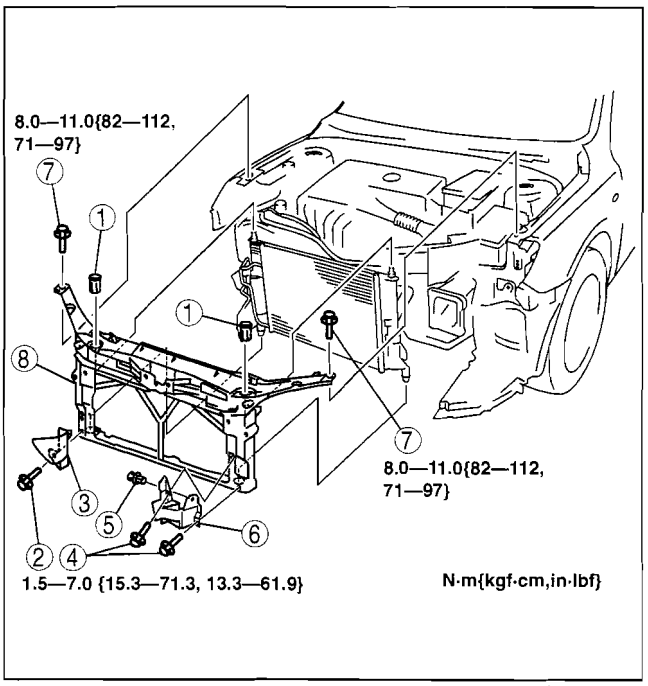
SHROUD PANEL REMOVAL/INSTALLATION

id091000801900

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front bumper (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
   (2) Front combination light (See 09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (3) Front bumper reinforcement (See 09-10-18 FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION.)
   (4) Hood latch (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Radiator mount cap
2	Bolt A
3	Seal platel
4	Bolt B
5	Fastener
6	Air guide
7	Bolt C
8	Shroud panel

4. Install in the reverse order of removal.



am3uuw0000046

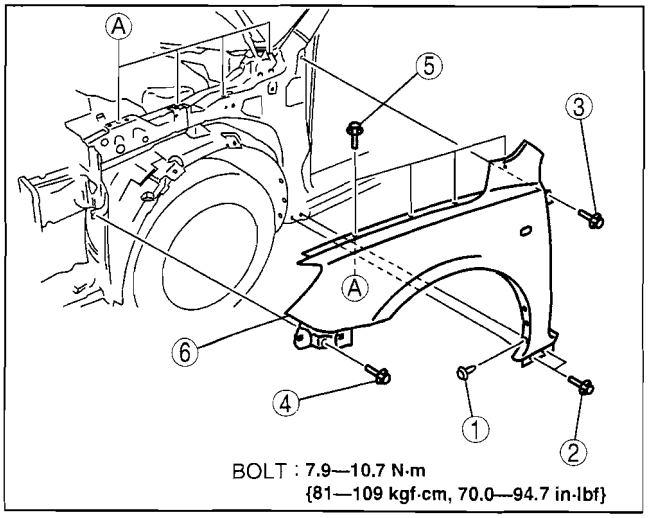
FRONT FENDER PANEL REMOVAL/INSTALLATION

id091000801000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Windshield wiper arm and blade (See09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (2) Cowl grille (See09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
   (3) Front side turn lights (See09-18-14 FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION.)
   (4) Front bumper (See09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
   (5) Front combination lights (See09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (6) Side step molding (Vehicle with the side step molding) (See09-16-6 SIDE STEP MOLDING REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Fastener
2	Bolt A
3	Bolt B
4	Bolt C
5	Bolt D
6	Front fender panel

4. Install in the reverse order of removal.

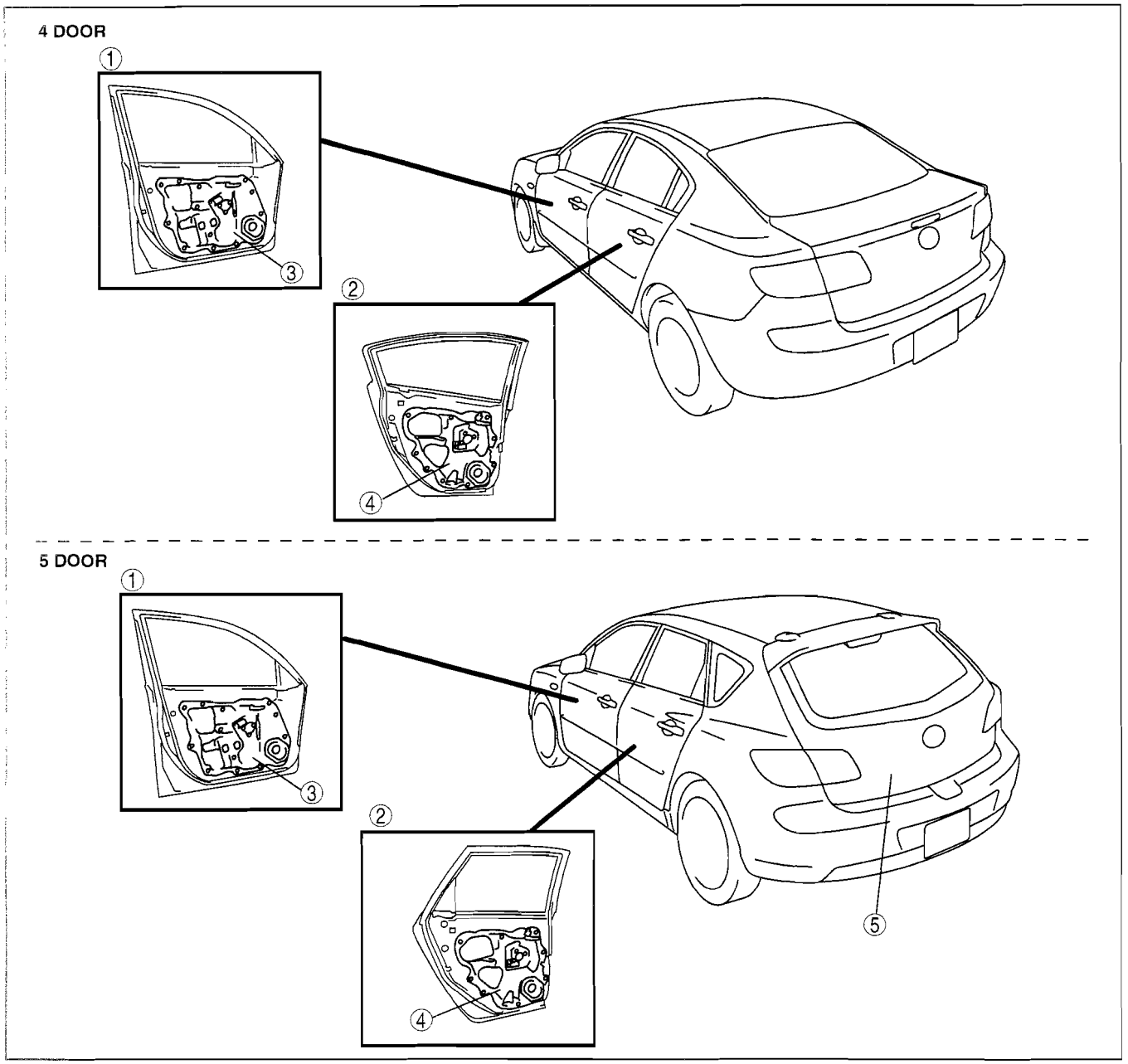


am3uuw0000045

09-11 DOORS AND LIFTGATE

DOORS AND LIFTGATE LOCATION INDEX

id091100803300



c3u0911w101

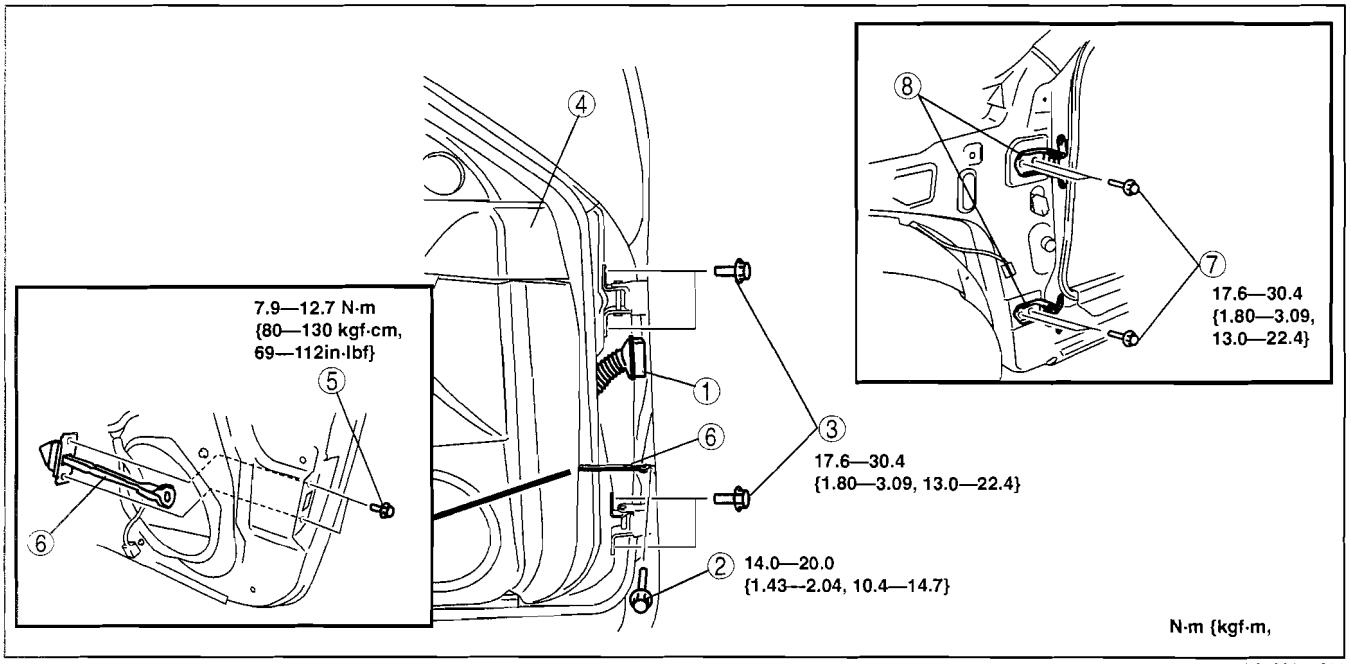
1	Front door (See 09-11-3 FRONT DOOR REMOVAL/ INSTALLATION.) (See 09-11-5 DOOR ADJUSTMENT.)
2	Rear door (See 09-11-4 REAR DOOR REMOVAL/ INSTALLATION.) (See 09-11-5 DOOR ADJUSTMENT.)

3	Front door unit (See 09-11-6 FRONT DOOR UNIT REMOVAL/ INSTALLATION.)
4	Rear door unit (See 09-11-7 REAR DOOR UNIT REMOVAL/ INSTALLATION.)
5	Liftgate (See 09-11-8 LIFTGATE REMOVAL/INSTALLATION.) (See 09-11-9 LIFTGATE ADJUSTMENT.)

FRONT DOOR REMOVAL/INSTALLATION

id091100800200

1. Disconnect the negative battery cable.
2. To remove the checker, remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
3. To remove the front door hinges, remove the following parts:
   (1) Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (2) Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
   (3) Front bumper (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
   (4) Front combination lights (See 09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (5) Side step molding (Vehicle with the side step molding) (See 09-16-6 SIDE STEP MOLDING REMOVAL/INSTALLATION.)
   (6) Front fender panel (See 09-10-21 FRONT FENDER PANEL REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Adjust the front door. (See 09-11-5 DOOR ADJUSTMENT.)
6. Install in the reverse order of removal.



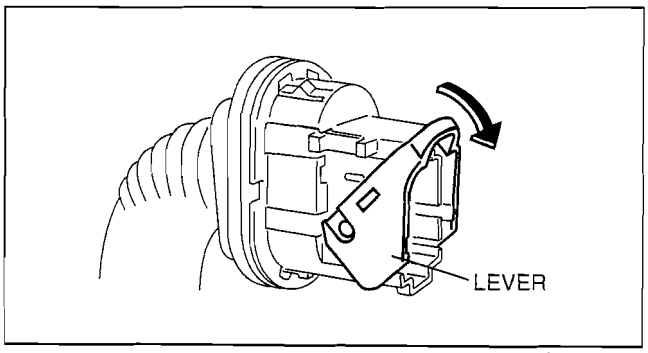
b3e0911w003

1	Connector (See 09-11-3 Connector Removal Note.)
2	Bolt A
3	Bolt B
4	Front door

5	Bolt C
6	Checker
7	Bolt D
8	Front door hinge

Connector Removal Note

1. Pull down the lever in the direction indicated by the arrow and disconnect the connector.

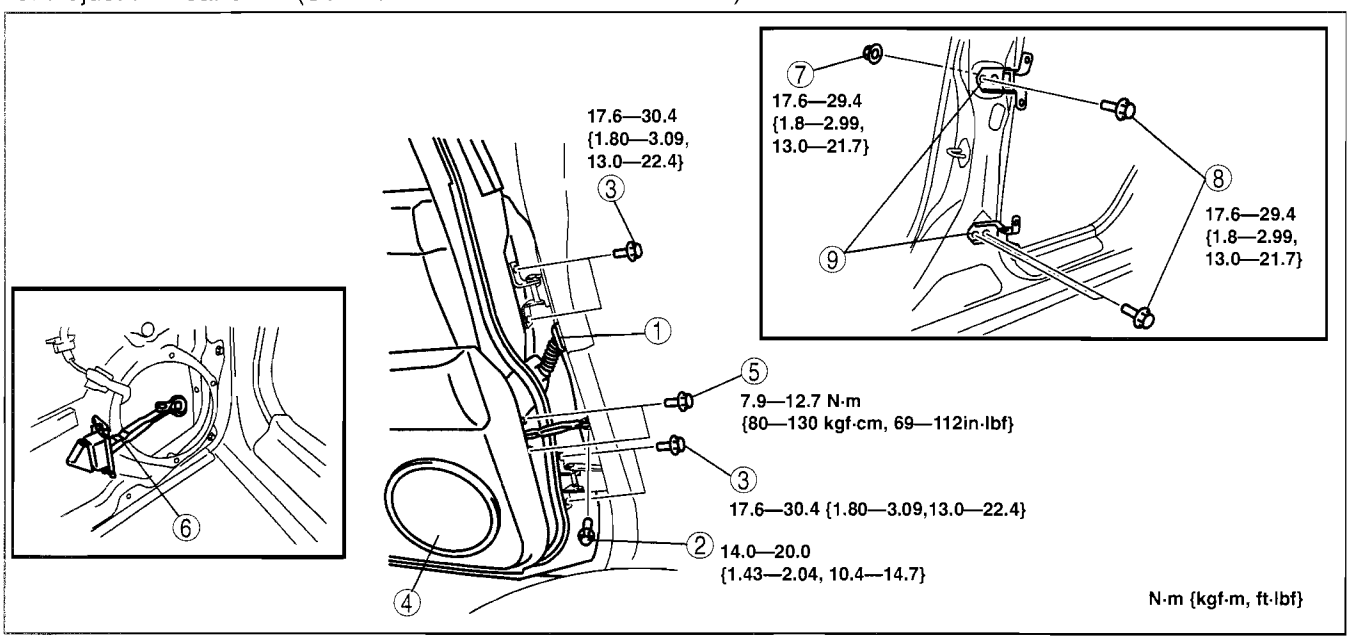


am3uuw0000082

REAR DOOR REMOVAL/INSTALLATION

id091100800300

1. Disconnect the negative battery cable.
2. To remove the checker, remove the following parts:
   (1) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (2) Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (3) Rear door speaker (See 09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)
3. To remove the hinges, remove the following parts:
   (1) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Adjust the rear door. (See 09-11-5 DOOR ADJUSTMENT.)



b3e0911w004

1	Connector
2	Bolt A
3	Bolt B
4	Rear door
5	Bolt C

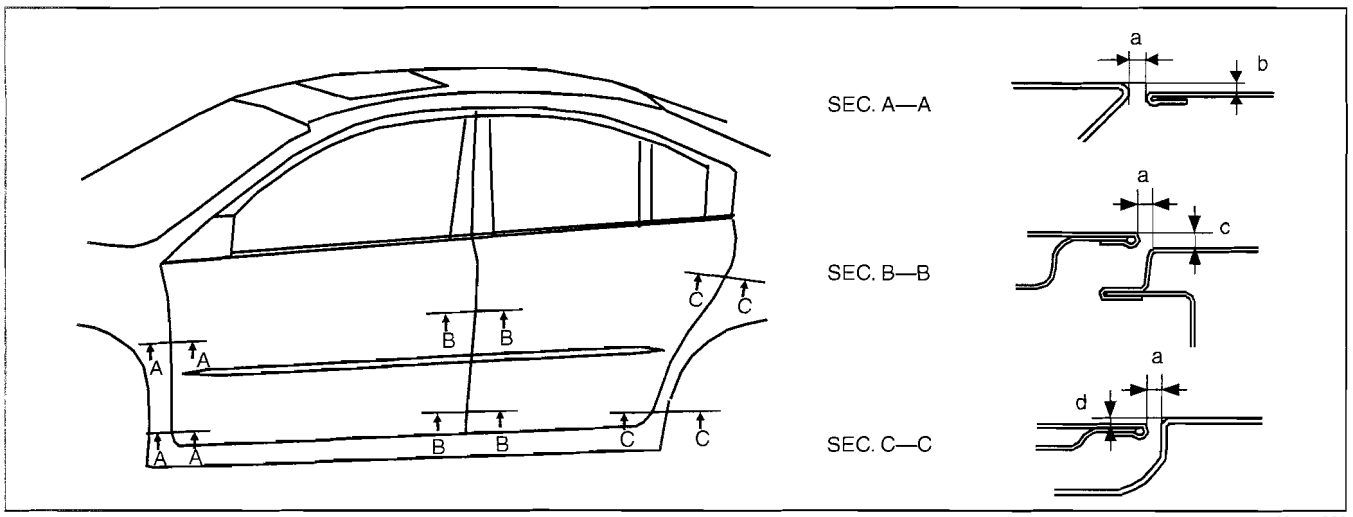
6	Checker
7	Nut
8	Bolt D
9	Rear door hinge

DOOR ADJUSTMENT

id091100800400

1. Measure the gap and height difference between the front or rear door and the body.
2. Loosen the door hinge installation bolts or the door lock striker installation screws, and adjust the door.

Standard clearance
a: 2.7—4.7 mm {0.11—0.18 in}
b (sec. A—A top): -1.0—1.0 mm {-0.040—0.039 in}
b (sec. A—A bottom): -0.3—1.3 mm {-0.027—0.051 in}
c: -1.0—1.0 mm {-0.040—0.039 in}
d (sec. C—C top): -1.0—1.0 mm {-0.040—0.039 in}
d (sec. C—C bottom): -0.5—1.5 mm {-0.020—0.059 in}



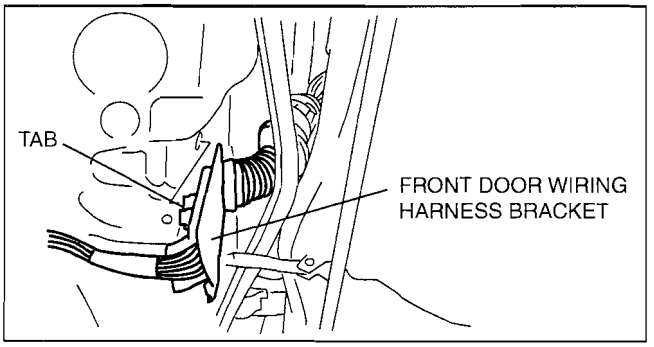
c3u0911w002

3. Tighten the bolts or screws.

FRONT DOOR UNIT REMOVAL/INSTALLATION

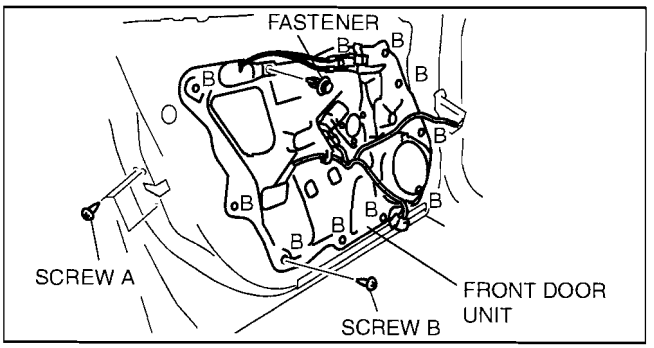
id091100800500

1. Remove the following parts:
   (1) Inner garnish (See09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front beltline molding (See09-16-3 FRONT BELTLINE MOLDING REMOVAL/INSTALLATION.)
   (5) Front door glass (See09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
   (6) Front door speaker (See09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
   (7) Rod protector (See09-14-4 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION.)
2. Remove the rod from the front outer handle and front door key cylinder.
3. Disconnect the power outer mirror connector.
4. Disconnect the front door wiring harness connector.
5. Remove the tab, then remove the front door wiring harness bracket.



am3uuw0000046

6. Remove screws A, B, and the fastener.
7. Remove the front door unit.
8. Install in the reverse order of removal.

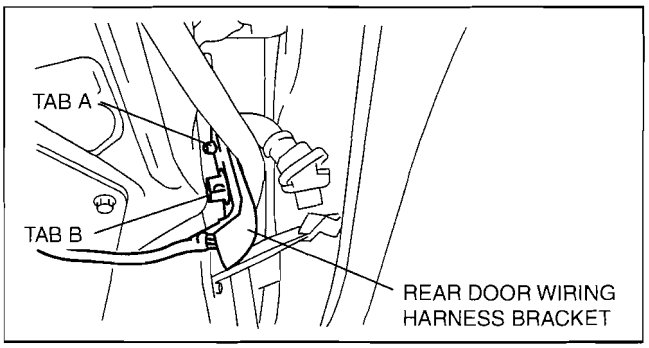


c3u0911w001

REAR DOOR UNIT REMOVAL/INSTALLATION

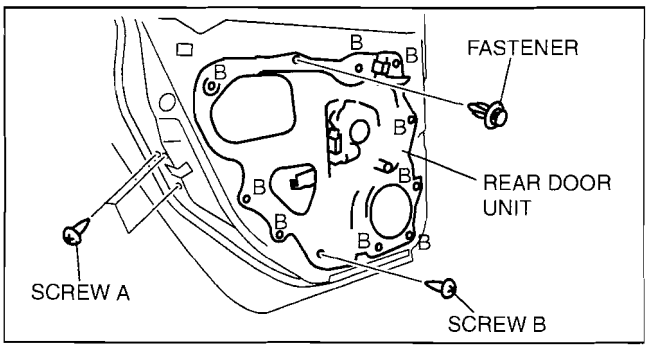
id091100800600

1. Remove the following parts:
   (1) Sail garnish (5 door) (See09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Rear door trim (See09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Rear door garnish (5 door) (See09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
   (5) Rear beltline molding (See09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
   (6) Rear door glass (See09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
   (7) Rear door speaker (See09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)
2. Remove the rod from the outer handle.
3. Disconnect the rear door wiring harness connector.
4. Remove tabs A and B, then remove the rear door wiring harness bracket.



am3uuw0000046

5. Remove screws A, B, and the fastener.
6. Remove the rear door unit.
7. Install in the reverse order of removal.



am3uuw0000047

LIFTGATE REMOVAL/INSTALLATION

id091100800700

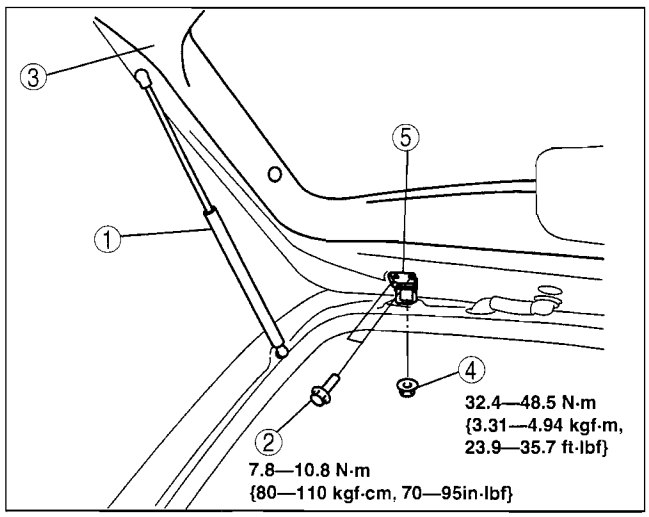
Warning

- **Removing the stay damper without supporting the liftgate can be dangerous. The liftgate may fall and injure you. Always perform the following procedure with at least another person.**

1. Disconnect the negative battery cable.
2. Remove the trunk side upper trims. (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove the C-pillar trims. (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
4. Remove the fasteners on the rear part of the headliner and disconnect the following parts while partially peeling back the headliner.
   - Rear washer hose
   - Liftgate wiring harness connector
5. Remove the grommets from the liftgate.
6. Remove in the order indicated in the table.

1	Stay damper (See 09-11-8 Stay Damper Removal Note.)
2	Bolt
3	Liftgate
4	Nut
5	Liftgate hinge

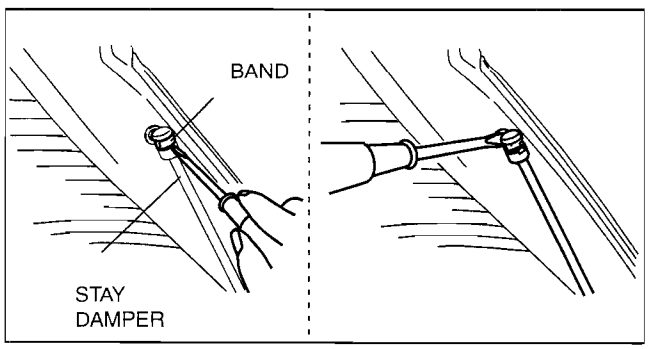
7. Install in the reverse order of removal.
8. Adjust the liftgate. (See 09-11-9 LIFTGATE ADJUSTMENT.)



am3uuw0000047

Stay Damper Removal Note

1. Pry off the stay damper band using a flathead screwdriver.
2. Pry out the connecting parts of the stay damper out of the liftgate with a flathead screwdriver and then remove the stay damper.



am3uuw0000047

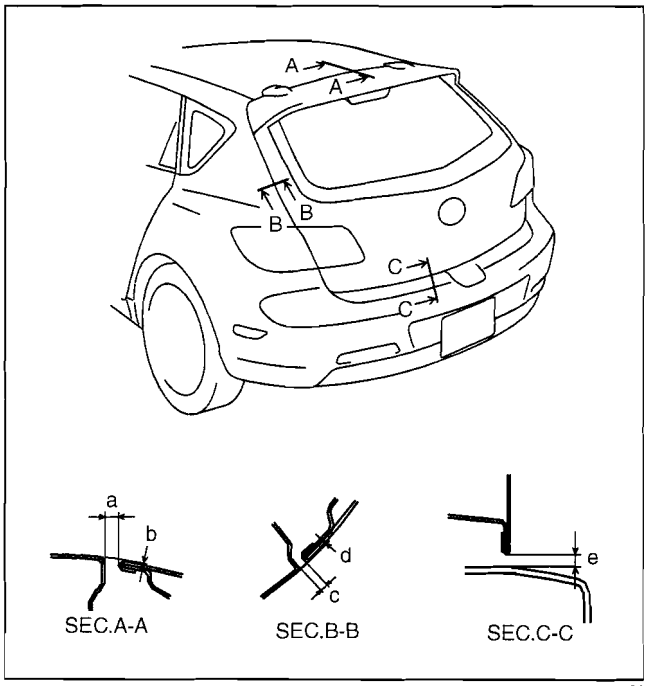
LIFTGATE ADJUSTMENT

id091100800900

1. Measure the gap and height difference between the liftgate and the body.
2. Loosen the liftgate hinge installation nuts and adjust the liftgate.
   - If necessary, loosen the liftgate lock striker installation bolts and adjust the liftgate. (See 09-14-14 LIFTGATE LOCK STRIKER REMOVAL/INSTALLATION.)

   Standard clearance
   a: 5.0—7.0 mm {0.20—0.27 in}
   b: -2.0—0 mm {-0.07—0 in}
   c: 3.5—6.5 mm {0.14—0.25 in}
   d: -1.7—0.7 mm {-0.067—0.027 in}
   e: 4.0—8.0 mm {0.16—0.31 in}

3. Tighten the nuts or bolts.



c3u0911w102

09-11

LIFTGATE STAY DAMPER DISPOSAL

id091100803400

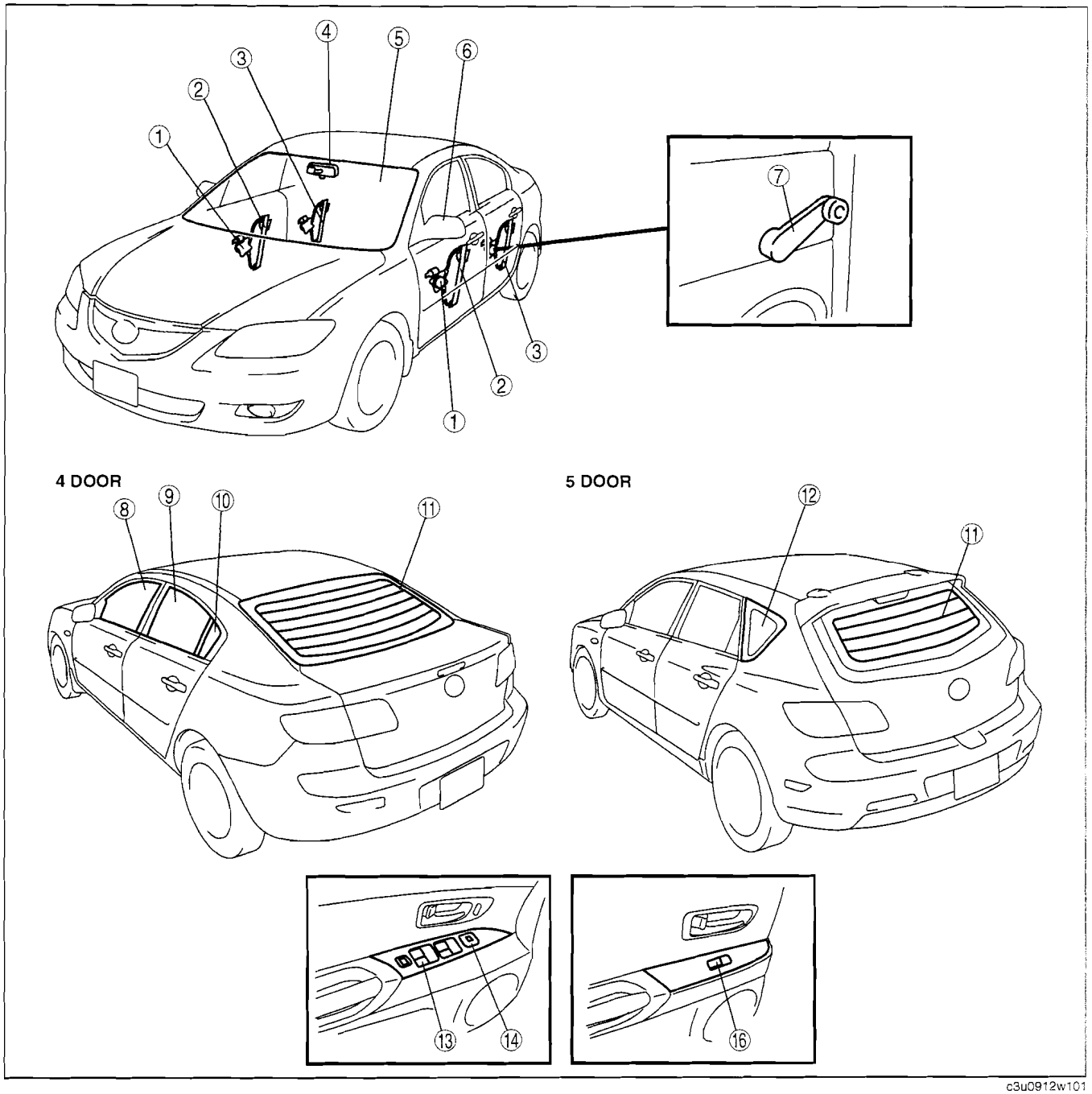
1. Referring to procedures for trunk lid stay damper disposal, dispose of the liftgate stay damper. (See09-10-7 TRUNK LID STAY DAMPER DISPOSAL.)

09-12 GLASS/WINDOWS/MIRRORS

GLASS/WINDOWS/MIRRORS

GLASS/WINDOWS/MIRRORS LOCATION INDEX

id091200800100



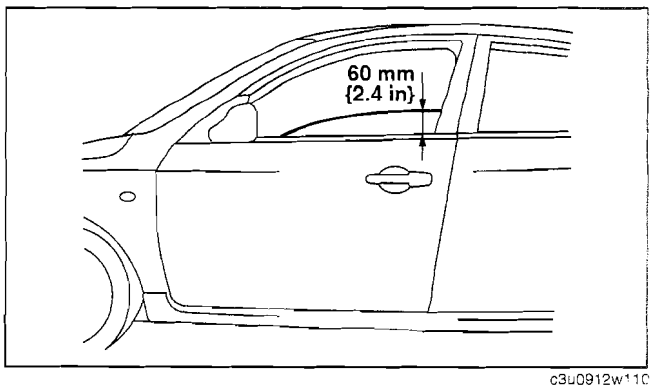
c3u0912w101

1	Power window motor (See 09-12-12 POWER WINDOW MOTOR REMOVAL/INSTALLATION.) (See 09-12-12 POWER WINDOW MOTOR INSPECTION.)
2	Front window regulator (See 09-12-8 FRONT POWER WINDOW REGULATOR REMOVAL/INSTALLATION.) (See 09-12-9 FRONT MANUAL WINDOW REGULATOR REMOVAL/INSTALLATION.)
3	Rear window regulator (See 09-12-10 REAR POWER WINDOW REGULATOR REMOVAL/INSTALLATION.) (See 09-12-11 REAR MANUAL WINDOW REGULATOR REMOVAL/INSTALLATION.)
4	Rearview mirror (See 09-12-36 REARVIEW MIRROR REMOVAL/INSTALLATION.)
5	Windshield (See 09-12-16 WINDSHIELD REMOVAL.) (See 09-12-18 WINDSHIELD INSTALLATION.)

6	Power outer mirror (See 09-12-32 POWER OUTER MIRROR REMOVAL/INSTALLATION.) (See 09-12-33 POWER OUTER MIRROR DISASSEMBLY/ASSEMBLY.) (See 09-12-34 POWER OUTER MIRROR INSPECTION.) (See 09-12-32 OUTER MIRROR GARNISH REMOVAL.) (See 09-12-33 OUTER MIRROR GARNISH INSTALLATION.)
7	Regulator handle (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
8	Front door glass (See 09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
9	Rear door glass (See 09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
10	Rear door quarter glass (See 09-12-7 REAR DOOR QUARTER GLASS REMOVAL/INSTALLATION.)
11	Rear window glass (See 09-12-21 REAR WINDOW GLASS REMOVAL.) (See 09-12-24 REAR WINDOW GLASS INSTALLATION.) (See 09-12-31 FILAMENT INSPECTION.) (See 09-12-32 FILAMENT REPAIR.)
12	Quarter window glass (See 09-12-29 QUARTER WINDOW GLASS REMOVAL.) (See 09-12-30 QUARTER WINDOW GLASS INSTALLATION.)
13	Power window main switch (See 09-12-13 POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.) (See 09-12-14 POWER WINDOW MAIN SWITCH INSPECTION.)
14	Power outer mirror switches (See 09-12-35 POWER OUTER MIRROR SWITCH REMOVAL/INSTALLATION.) (See 09-12-35 POWER OUTER MIRROR SWITCH INSPECTION.)
15	Power window subswitch (See 09-12-15 POWER WINDOW SUBSWITCH REMOVAL/INSTALLATION.) (See 09-12-15 POWER WINDOW SUBSWITCH INSPECTION.)

FRONT DOOR GLASS REMOVAL/INSTALLATION

id091200800400



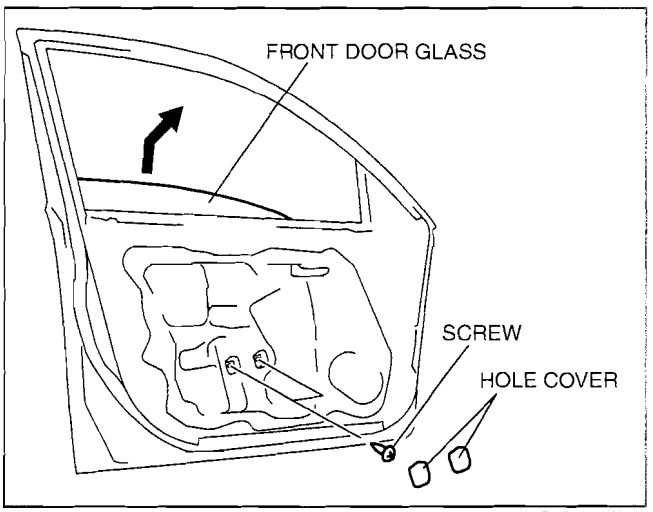
c3u0912w110

1. Adjust the door glass position as shown in the figure.
2. Disconnect the negative battery cable. (Vehicles with power window system)
3. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.)
5. Remove the front door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/ INSTALLATION.)
6. Remove the front door speaker. (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION.)

Note

- For installing the front door glass, the front door speaker must be removed to align the glass edge with the glass run channel by hand, through the speaker installation hole.

7. Remove the hole cover.
8. Remove the screws.
9. Lift the front door glass up and remove it while tilting it in the direction of the arrow.
10. Install in the reverse order of removal.



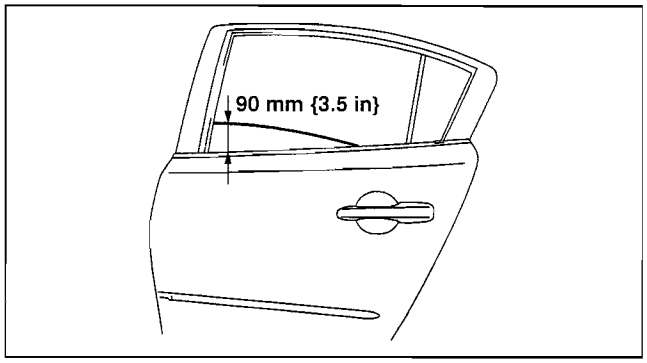
B3E0912W102

REAR DOOR GLASS REMOVAL/INSTALLATION

id091200800500

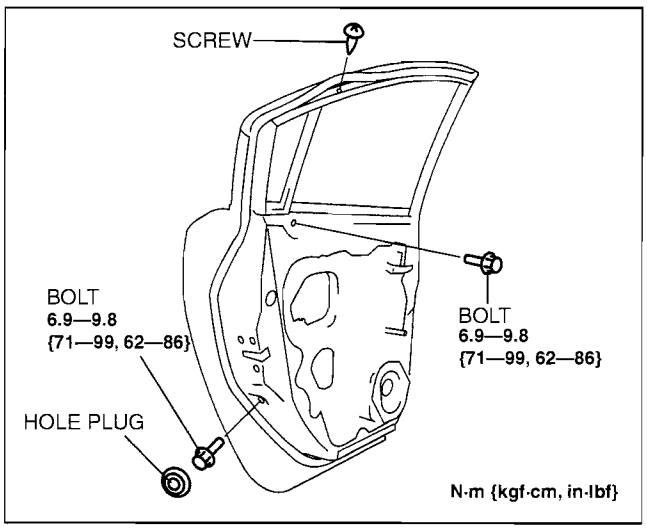
4 Door

1. Fully lower the rear door glass.
2. Remove the rear beltline molding. (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
3. Adjust the door glass position as shown in the figure.
4. Disconnect the negative battery cable. (Vehicles with power window system)
5. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.)
6. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)



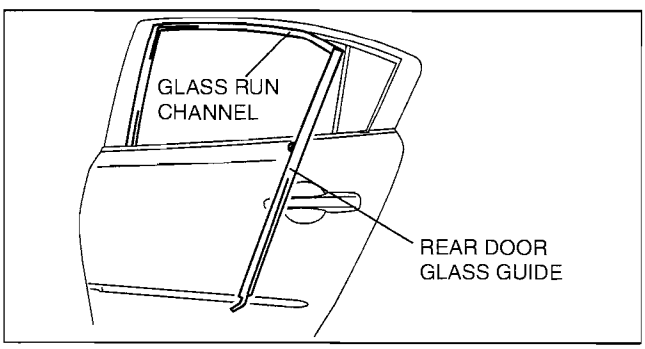
c3u0912w111

7. Remove the bolts and screw.



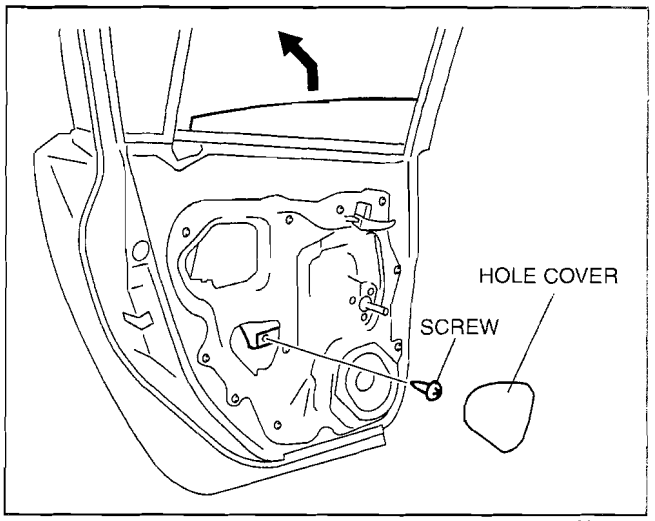
B3E0912W201

8. Remove the rear door glass guide and glass run channel as a single unit.
9. Remove the hole cover.



c3u0912w003

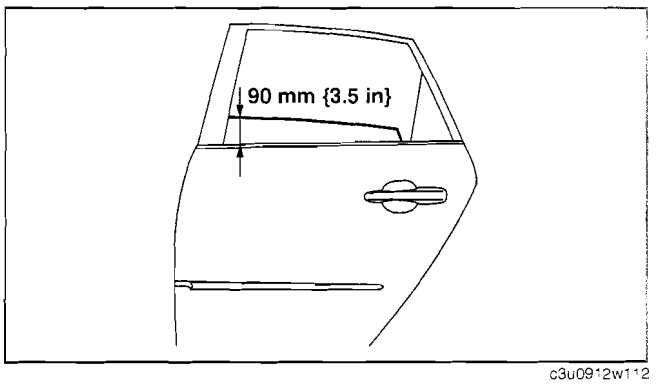
10. Remove the screw.
11. Lift the rear door glass up and remove while tilting it.
12. Install in the reverse order of removal.



c3u0912w005

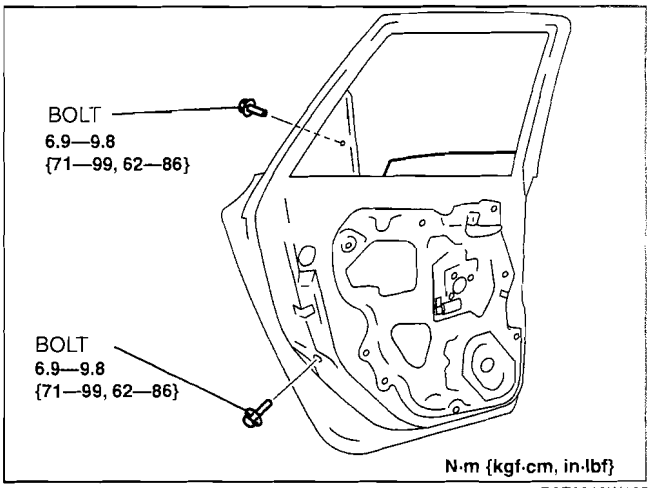
5 Door

1. Fully lower the rear door glass.
2. Remove the sail garnish. (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
3. Remove the rear door garnish. (See 09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
4. Remove the rear beltline molding. (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
5. Adjust the door glass position as shown in the figure.
6. Disconnect the negative battery cable. (Vehicles with power window system)
7. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.)
8. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)



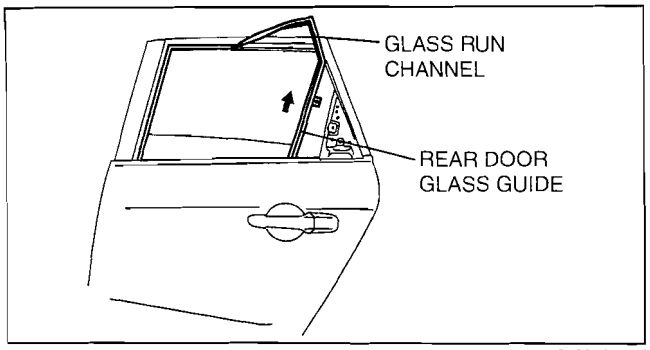
c3u0912w112

9. Remove the bolts.



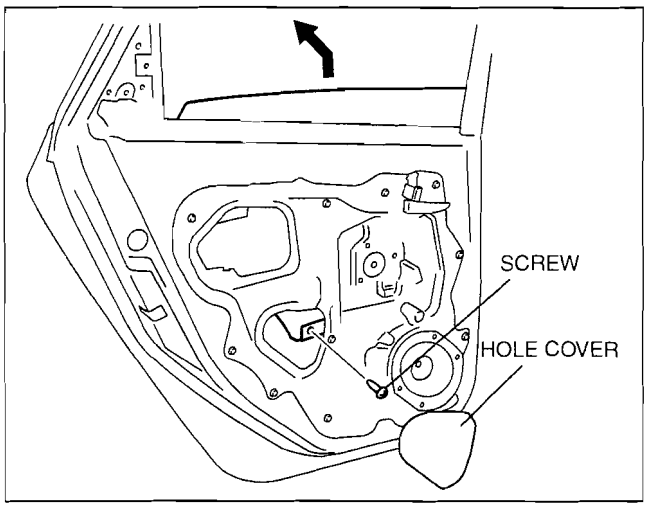
B3E0912W105

10. Remove the rear door glass guide and glass run channel as a single unit.
11. Remove the hole cover.



c3u0912w004

12. Remove the screw.
13. Lift the rear door glass up and remove while tilting it.
14. Install in the reverse order of removal.

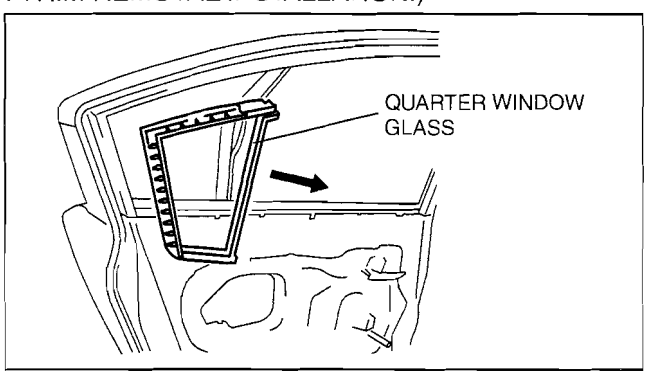


c3u0912w113

REAR DOOR QUARTER GLASS REMOVAL/INSTALLATION

id091200807200

1. Disconnect the negative battery cable. (Vehicles with power window system)
2. Remove the rear beltline molding. (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
3. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.)
4. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
5. Remove the rear door quarter glass.
6. Install in the reverse order of removal.

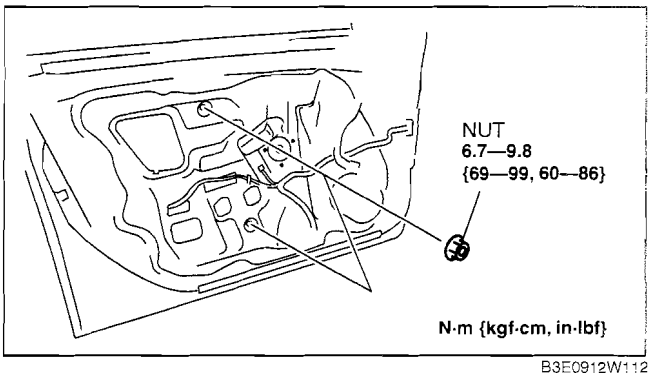


B3E0912W200

FRONT POWER WINDOW REGULATOR REMOVAL/INSTALLATION

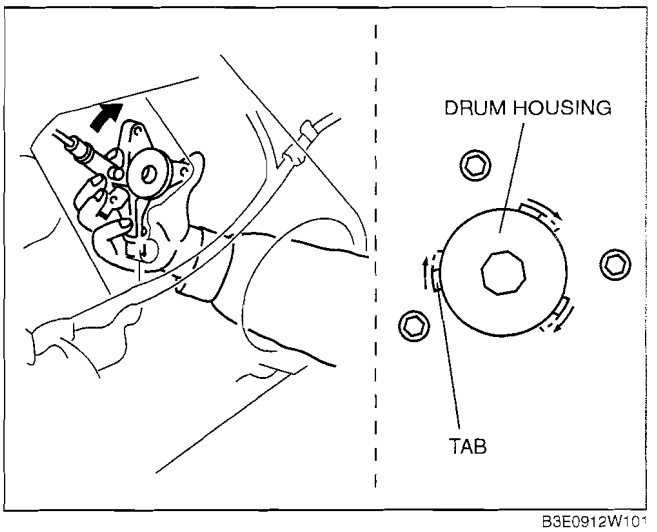
id091200800200

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (3) Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
   (4) Front door glass (See 09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
   (5) Power window motor (See 09-12-12 POWER WINDOW MOTOR REMOVAL/INSTALLATION.)
3. Remove the nuts.



B3E0912W112

4. Insert your hand through the front speaker installation hole, rotate the drum housing in the direction shown in the figure and disengage the tabs from the rear door module.

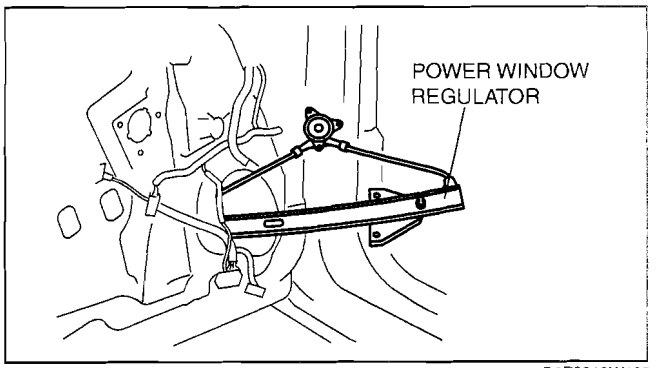


B3E0912W101

5. Remove the front power window regulator through the speaker installation hole.
6. Install in the reverse order of removal.

Caution

- **Make sure the cable does not unspool from the drum housing when installing.**

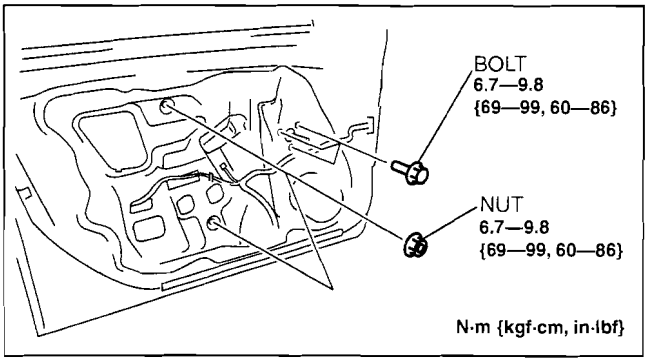


B3E0912W103

FRONT MANUAL WINDOW REGULATOR REMOVAL/INSTALLATION

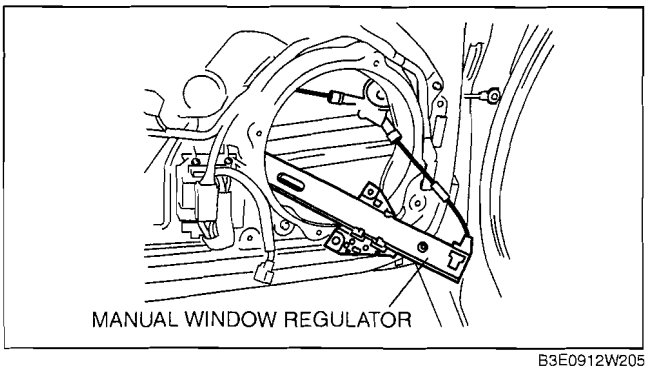
id091200807000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (See 09-12-11 REGULATOR HANDLE REMOVAL.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
   (5) Front door glass (See 09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
3. Remove the nuts and the bolts.



B3E0912W118

4. Remove the front manual window regulator through the speaker installation hole.
5. Install in the reverse order of removal.

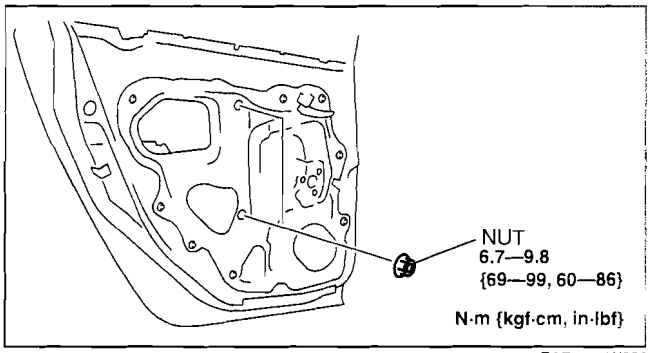


B3E0912W205

REAR POWER WINDOW REGULATOR REMOVAL/INSTALLATION

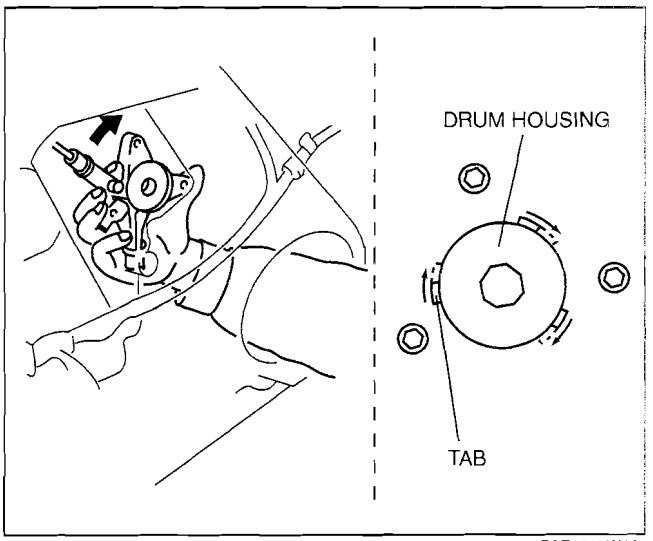
id091200800300

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Rear beltline molding (4 door) (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
   (2) Sail garnish (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
   (3) Rear door garnish (5 door) (See 09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
   (4) Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (5) Rear door speaker (See 09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)
   (6) Rear door glass (See 09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
   (7) Rear power window motor (See 09-12-12 POWER WINDOW MOTOR REMOVAL/INSTALLATION.)
3. Remove the nuts.



B3E0912W220

4. Insert your hand through the rear speaker installation hole, rotate the drum housing in the direction shown in the figure and disengage the tabs from the rear door module.

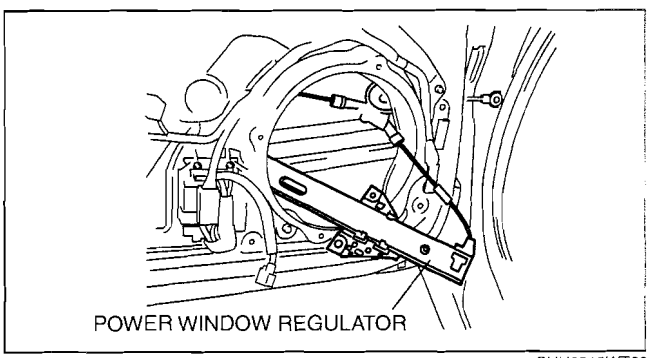


B3E0912W101

5. Remove the rear power window regulator through the speaker installation hole.
6. Install in the reverse order of removal.

Caution

- **Make sure the cable does not unspool from the drum housing when installing.**

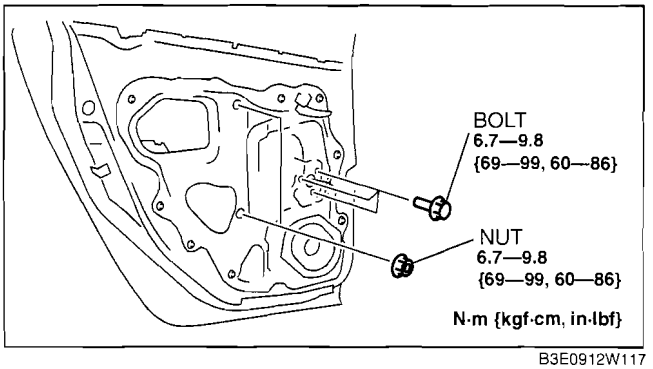


CHU0912WT33

REAR MANUAL WINDOW REGULATOR REMOVAL/INSTALLATION

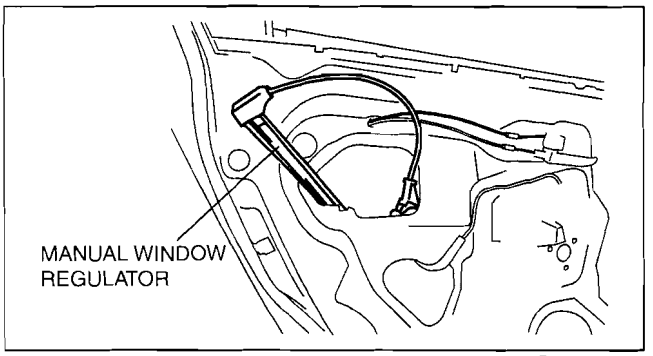
id091200807100

1. Remove the following parts:
   (1) Rear beltline molding (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
   (2) Sail garnish (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
   (3) Rear door garnish (5 door) (See 09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
   (4) Regulator handle (See 09-12-11 REGULATOR HANDLE REMOVAL.)
   (5) Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (6) Rear door glass (See 09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
2. Remove the nuts and the bolts.



B3E0912W117

3. Remove the rear manual window regulator through the rear door unit hole.
4. Install in the reverse order of removal.



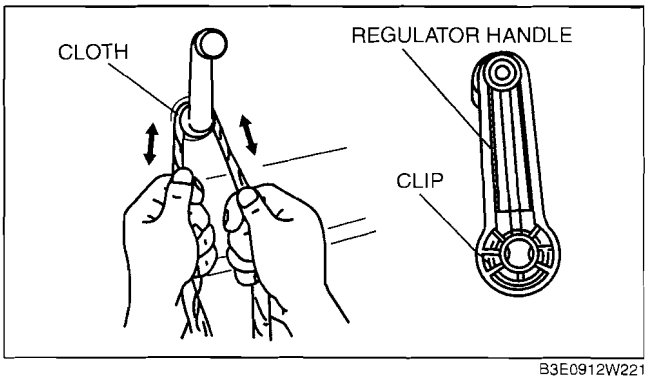
B3E0912W203

09-12

REGULATOR HANDLE REMOVAL

id091200806300

1. Using a cloth, remove the regulator handle installation clip and remove the regulator handle.

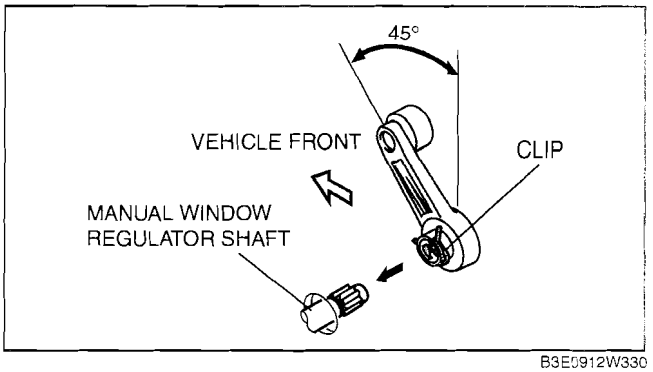


B3E0912W221

REGULATOR HANDLE INSTALLATION

id091200806200

1. Fully raise the door glass.
2. Install the clip to the regulator handle.
3. Install the regulator handle while tilting it as shown in the figure and press it onto the shaft.



B3E0912W330

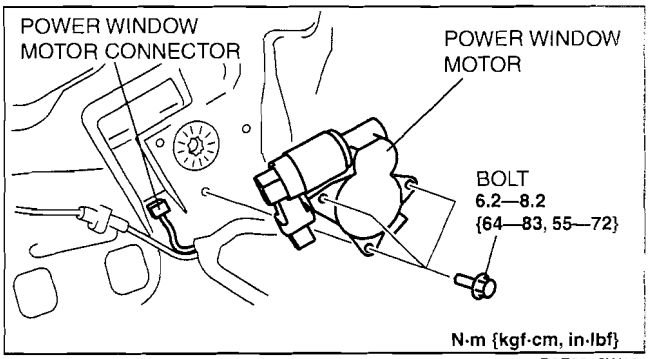
POWER WINDOW MOTOR REMOVAL/INSTALLATION

id091200803700

1. Disconnect the negative battery cable.
2. Remove the following parts:
   Front door
   - Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   - Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)

   Rear door
   - Sail garnish (5 door) (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   - Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
3. Remove the bolts.
4. Remove the power window motor from the power window regulator drum.
5. Disconnect the power window motor connector.
6. Install in the reverse order of removal.

Note
- When installing the power window motor to the power window regulator drum, the drum housing tab may come off the door unit. If this happens, remove the door speaker, insert your hand in the speaker installation hole, connect the drum housing tabs, and while supporting the drum housing, install the power window motor to the drum.



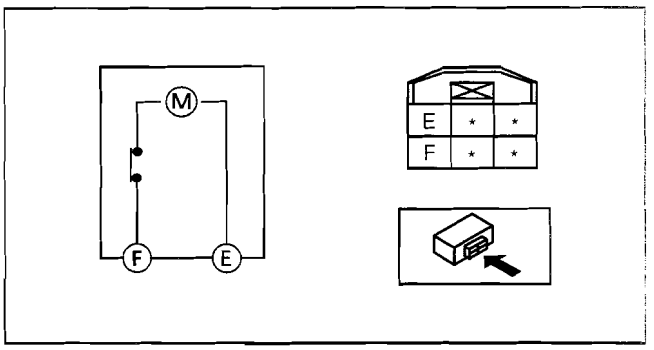
B3E0912W104

POWER WINDOW MOTOR INSPECTION

id091200800800

1. Apply battery positive voltage and connect ground to power window motor terminals E and F, and then inspect the power window motor operation.
   - If the power window motor does not operate as indicated in the table, replace it.

Operation	Terminal	
	Front: F Rear: E	Front: E Rear: F
Open	GND	B+
Closed	B+	GND

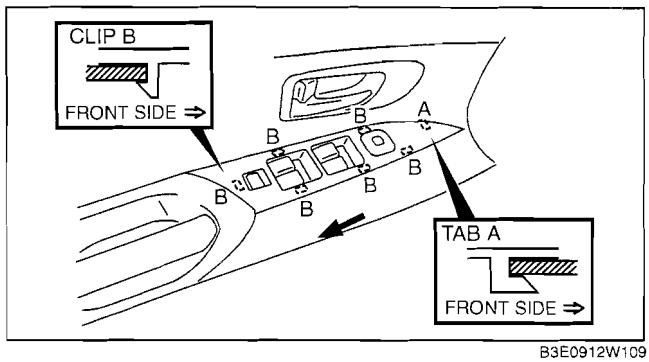


c3u0912w102

POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION

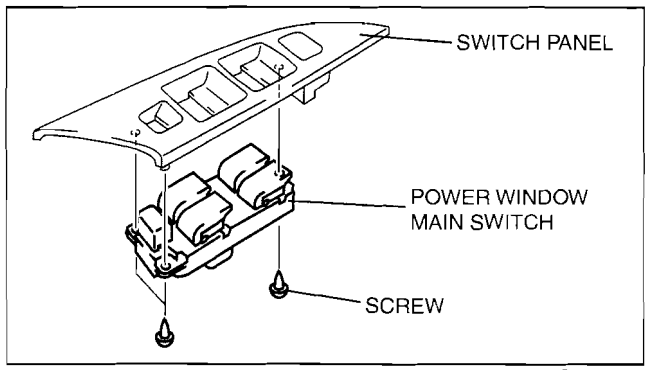
id091200801900

1. Disconnect the negative battery cable.
2. Remove the clips B using a flathead screwdriver wrapped with protective tape.
3. Remove the switch panel from the front door trim while sliding it in the direction of the arrow as shown in the figure.
4. Disconnect the power window main switch connector and the power outer mirror switch connector.



B3E0912W109

5. Remove the screws, then remove the power window main switch.
6. Install in the reverse order of removal.



B3E0912W113

POWER WINDOW MAIN SWITCH INSPECTION

id091200802000

1. When inspecting the passenger-side and rear power windows, turn the power-cut switch to UNLOCK.
2. Inspect for continuity between the power window main switch terminals.
   - If not as specified, replace the power window main switch.
3. Connect battery positive voltage to terminal E and ground to terminal I. Verify that there is continuity.
   - If not as specified, replace the power window main switch.

Driver's side ○—○ : Continuity

Switch position	Terminal			
	E	L	N	P
CLOSED	○		○	
	○			○
OFF		○	○	○
MANUAL OPEN AUTO OPEN	○			○
	○		○	

Passenger's side ○—○ : Continuity

Switch position	Terminal			
	E	L	D	B
CLOSED	○		○	
	○			○
OFF		○	○	○
OPEN	○			○
	○		○	

Rear right ○—○ : Continuity

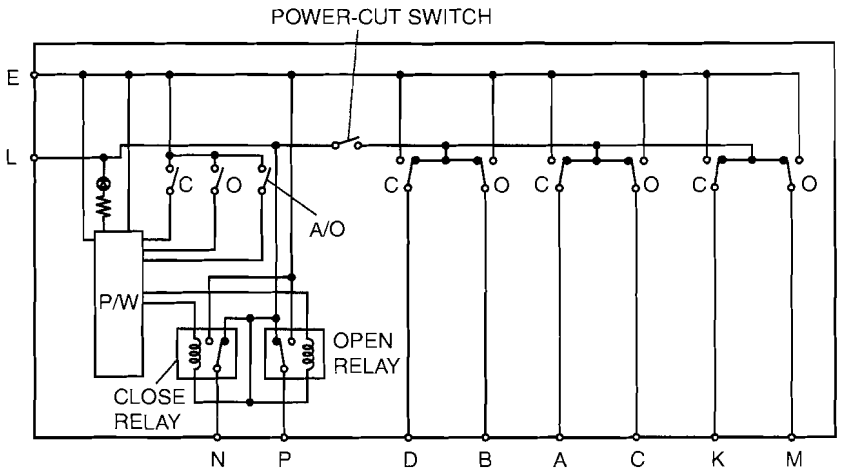
Switch position	Terminal			
	E	L	A	C
CLOSED	○		○	
	○			○
OFF		○	○	○
OPEN	○			○
	○		○	

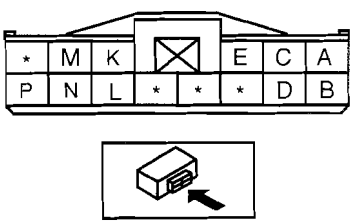
Rear left ○—○ : Continuity

Switch position	Terminal			
	E	L	K	M
CLOSED	○		○	
	○			○
OFF		○	○	○
OPEN	○			○
	○		○	

Power-cut switch ○—○ : Continuity

Switch position	Terminal								
	L	N	P	D	B	A	C	K	M
UNLOCK	○	○	○	○	○	○	○	○	○
LOCK	○	○	○	○	○	○	○	○	○





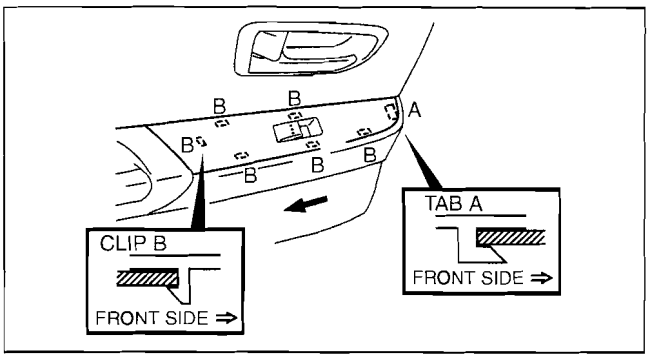
A/O : AUTO OPEN C : CLOSE O : OPEN

c3u0912w103

POWER WINDOW SUBSWITCH REMOVAL/INSTALLATION

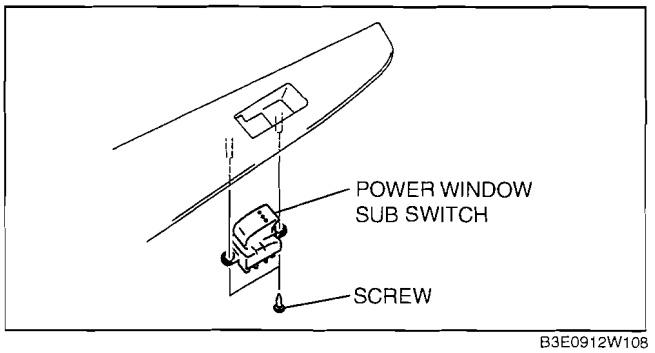
id091200802100

1. Disconnect the negative battery cable.
2. Remove the clips B using a flathead screwdriver wrapped with protective tape.
3. Remove the switch panel from the door trim while sliding it in the direction of the arrow as shown in the figure.
4. Disconnect the power window subswitch connector.



B3E0912W110

5. Remove the screws, then remove the power window subswitch.
6. Install in the reverse order of removal.



B3E0912W108

POWER WINDOW SUBSWITCH INSPECTION

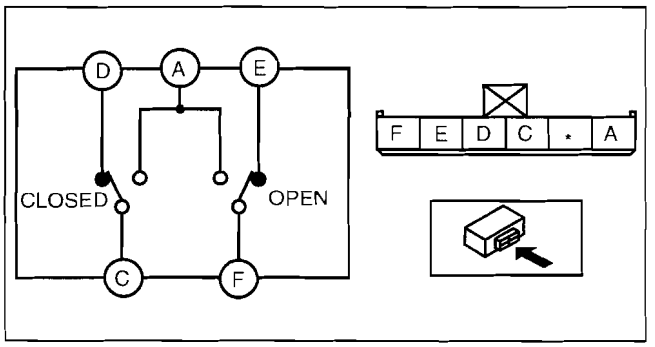
id091200802200

1. Verify continuity as indicated in the table.
   - If not as indicated in the table, replace the power window subswitch.

O—O : Continuity

Switch position	Terminal				
	A	C	D	E	F
CLOSED	O—O			O—O	
OFF		O—O		O—O	
OPEN	O—O	O—O			O

c3u0912w105

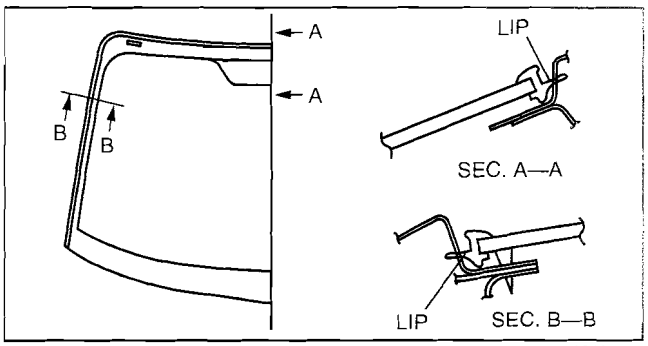


c3u0912w104

WINDSHIELD REMOVAL

id091200801300

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (2) Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
   (3) Rearview mirror (See 09-12-36 REARVIEW MIRROR REMOVAL/INSTALLATION.)
   (4) Rain sensor (Vehicles with auto wiper system) (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)
   (5) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (6) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (7) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
3. Set the headliner out of the way.
4. Apply protective tape along the edge of the body.
5. Apply protective tape to the dashboard to protect it from damage.
6. Cut the windshield molding lip using a razor.



c3u0912w114

Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note

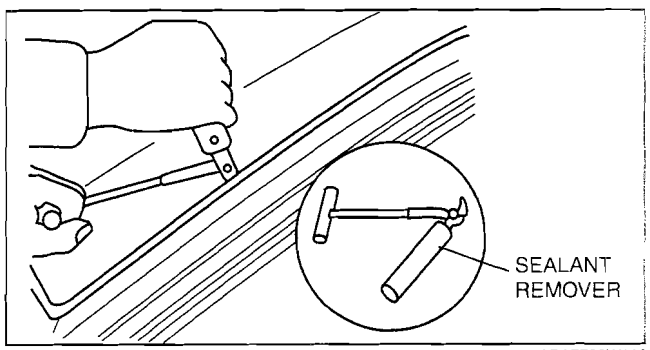
- The windshield molding is a replacement part.
- Vehicles with the auto wiper system have a lens sensor which is embedded in the windshield. If the lens sensor has a malfunction, it must be replaced together with the windshield. Since once the rain sensor initial setting has been performed, it cannot be used with any other lens sensor, also replace the rain sensor with a new one.

Not Reusing Windshield

Note

- For the areas of the sealant that are difficult to cut, use the **SST** (piano wire) and follow the procedure under "Reusing Windshield".

1. Cut out the sealant all around the glass using a sealant remover.
2. Remove the sealant by pulling it off.
3. Remove the windshield.

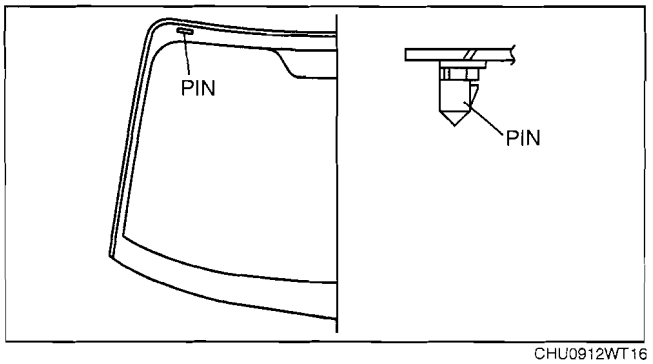


ADA7738W002

Reusing Windshield

Note
- Before removing the windshield from the body, mark the position of the windshield by affixing tape to the windshield and body panel.

1. Make a hole through the sealant from the inside of the vehicle using an awl, avoiding the pins.

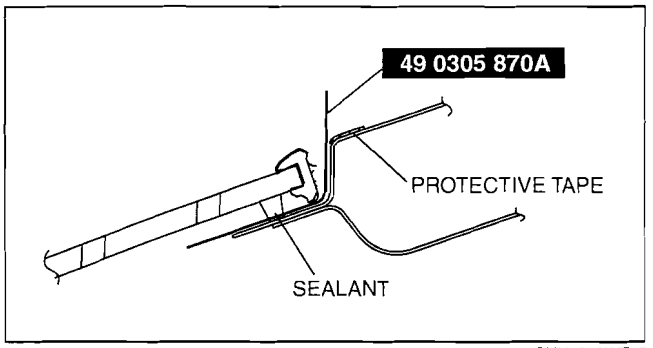


CHU0912WT16

2. Pass the **SST** (piano wire), cut to sufficient length, through the hole.

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

3. Wind each end of the **SST** (piano wire) around a bar.

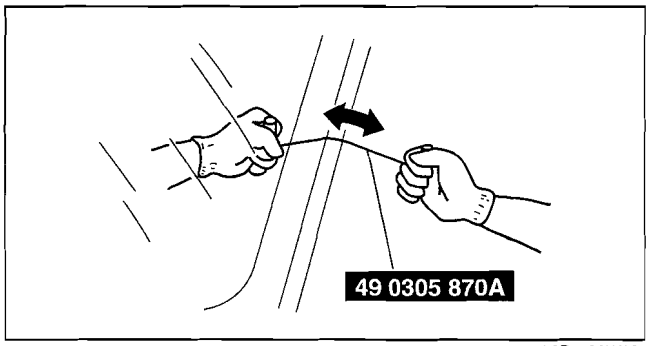


CHU0912WT17

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

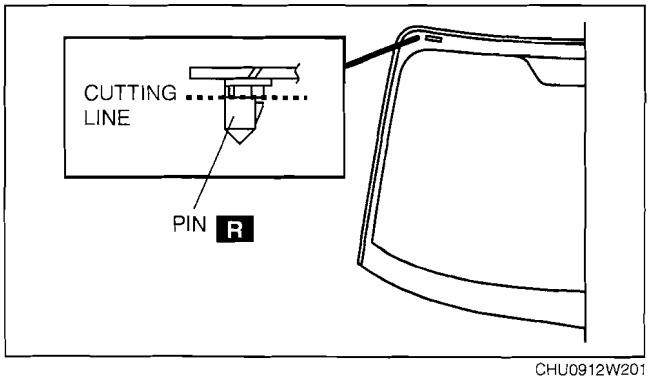
4. Fix one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the windshield.

Note
- As the upper part of the pin adheres to the sealant, cut it using the **SST** (piano wire).



A6E7738W021

5. Cut the pins out.
6. Remove the windshield.
7. Mark the seating positions of the pins and remove the pins from the windshield.
8. Remove the windshield molding from the windshield.



CHU0912W201

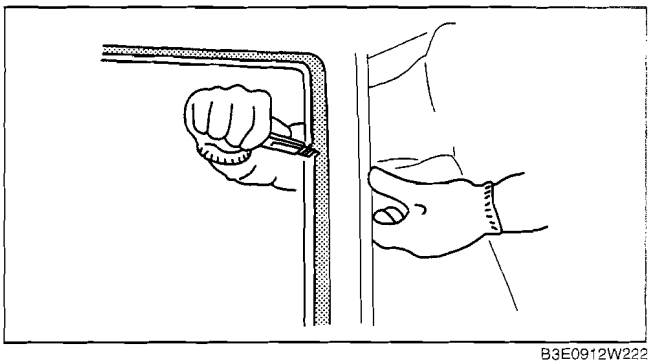
WINDSHIELD INSTALLATION

id091200801400

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

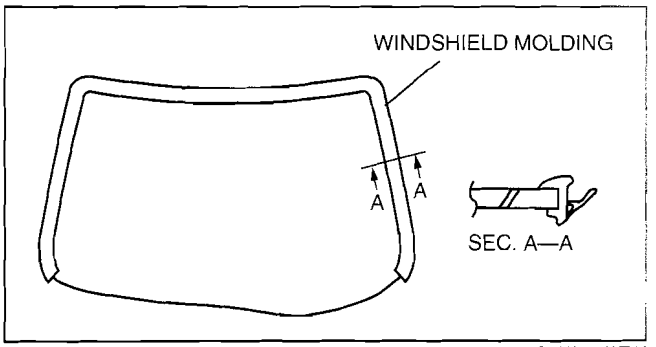
Caution
- **Proper installation of the windshield may be difficult if sealant is cracked or the glass is pushed out by air pressure when a door is opened/closed with all the window glass closed. Leave all the windows open until the windshield is installed completely.**

1. Cut away the old sealant using a razor so that a **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.
2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it to dry for **approx. 30 min**. Then apply a **2 mm {0.08 in}** thickness of sealant.
3. Clean and degrease an **approx. 50 mm {1.97 in}** wide strip along the perimeter of the windshield and the bonding area on the body.



B3E0912W222

4. If installing a reused windshield, perform the following procedure:
   (1) Attach the pins to the seating positions marked during removal.
   (2) Install the windshield molding.

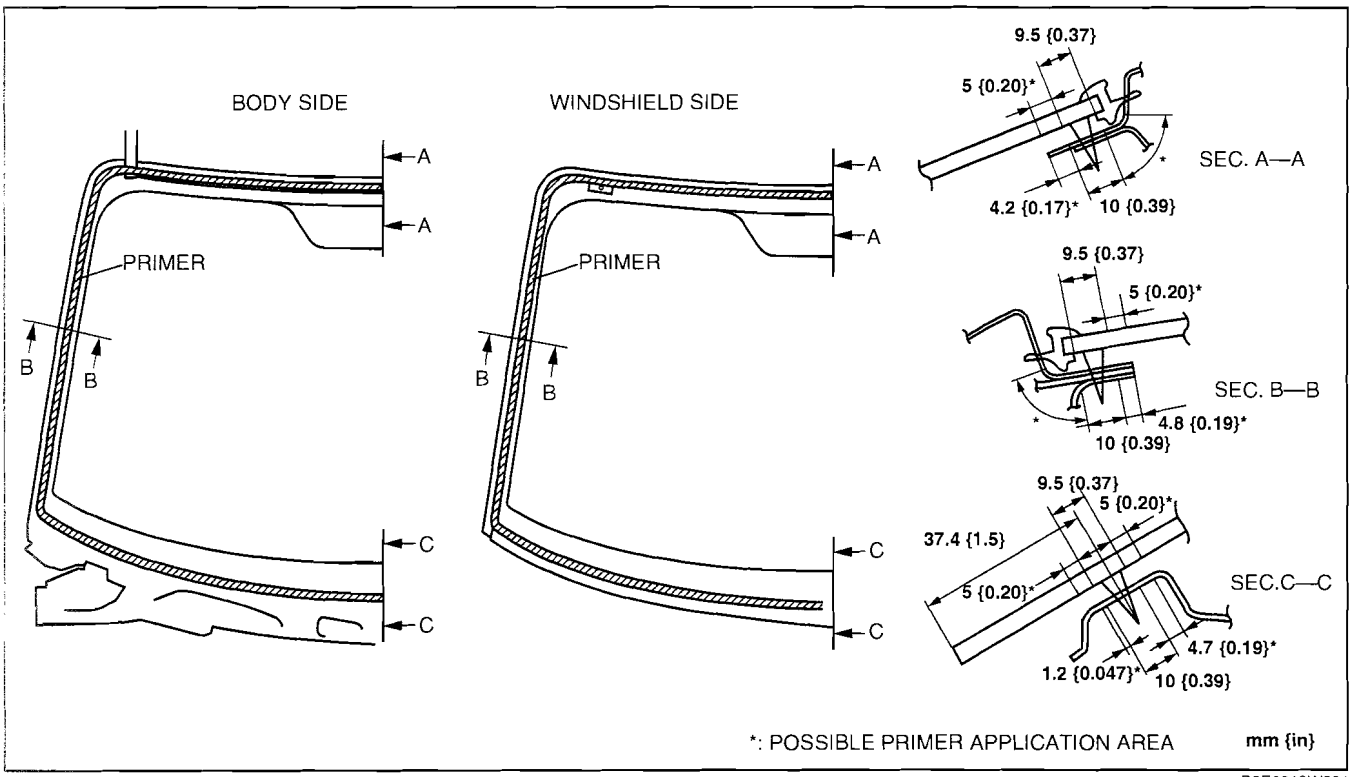


CHU0912W112

5. Apply glass primer on the glass, and body primer on the body and the molding, then allow it to dry for **approx. 30 min.**

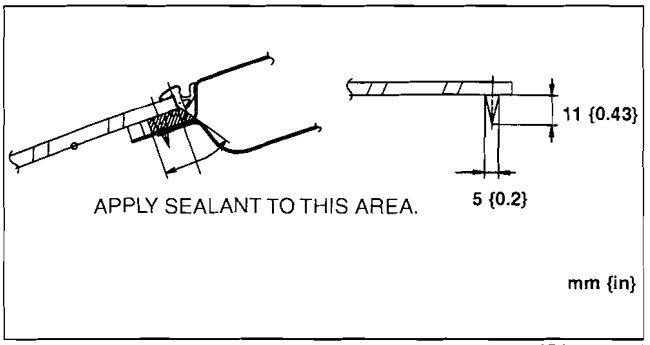
Caution

- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass and body, which may cause leakage.**



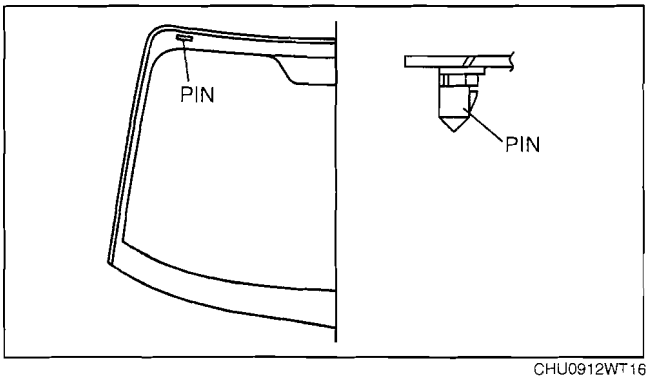
B3E0912W304

6. Apply sealant to the glass surface as shown in the figure.
7. Insert the positioning pins into the body, then install the windshield.



ADA7738W009

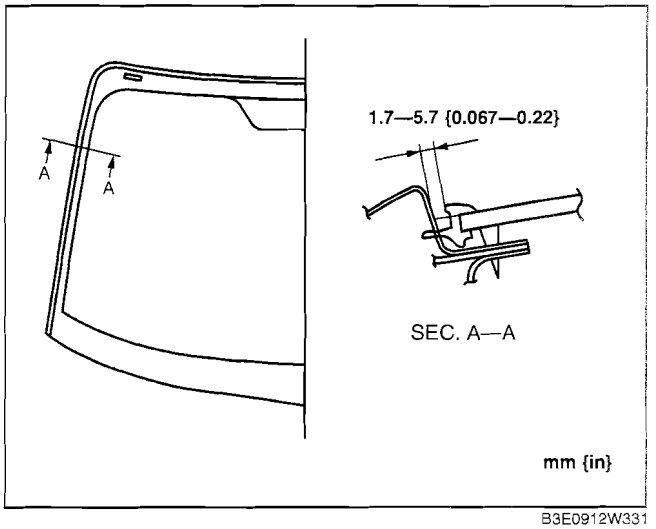
8. Press the windshield pins to engage the tabs to the body.



CHU0912W016

9. Press completely along the perimeter of the glass so that the measurement of the molding lip gap is within the specification.
10. Install the following parts:
    (1) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
    (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
    (3) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
    (4) Rain sensor (With automatic wiper system) (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)
    (5) Rearview mirror (See 09-12-36 REARVIEW MIRROR REMOVAL/INSTALLATION.)
    (6) Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
    (7) Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
11. Allow the sealant to harden completely.

Sealant hardening time: 24 h



B3E0912W331

REAR WINDOW GLASS REMOVAL

id091200801500

4 Door

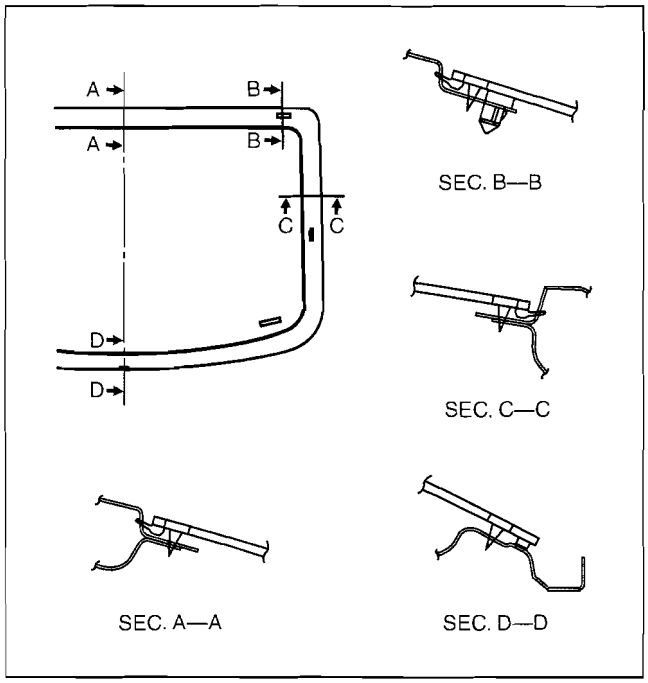
1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (5) Rear package trim (See 09-17-16 REAR PACKAGE TRIM REMOVAL/INSTALLATION.)
3. Disconnect the filament connector.
4. Set the headliner out of the way.
5. Apply protective tape along the edge of the body.
6. Cut the rear window glass molding lip using a razor.

Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note

- The rear window glass molding is a replacement part.



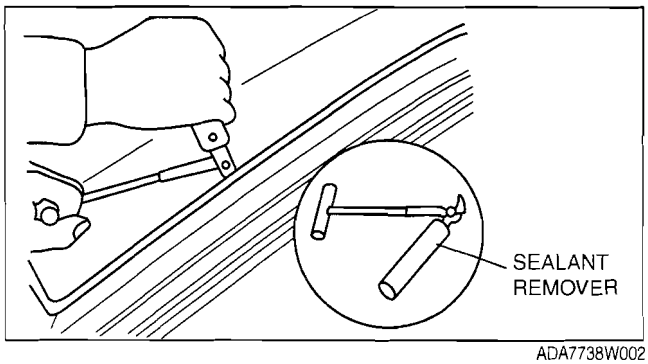
B3E0912W308

Not Reusing Rear Window Glass

Note

- For the areas of the sealant that are difficult to cut, use the **SST** (piano wire) and follow the procedure under "Reusing Rear Window Glass".

1. Cut out the sealant all around the glass using a sealant remover.
2. Remove the sealant by pulling it off.
3. Remove the rear window glass.

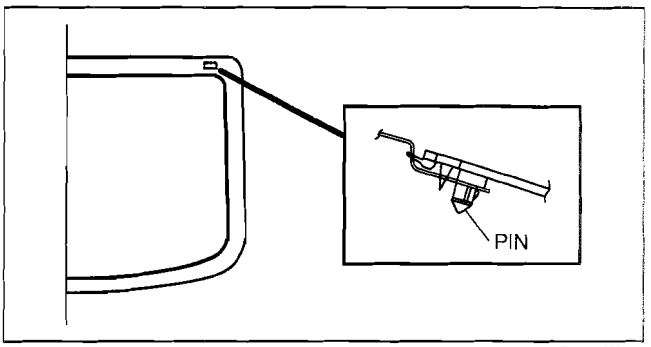


ADA7738W002

Reusing Rear Window Glass

Note
- Before removing the rear window glass from the body, mark the position of the glass by affixing tape to the glass and body panel.

1. Make a hole through the sealant from the inside of the vehicle using an awl, avoiding the pins.

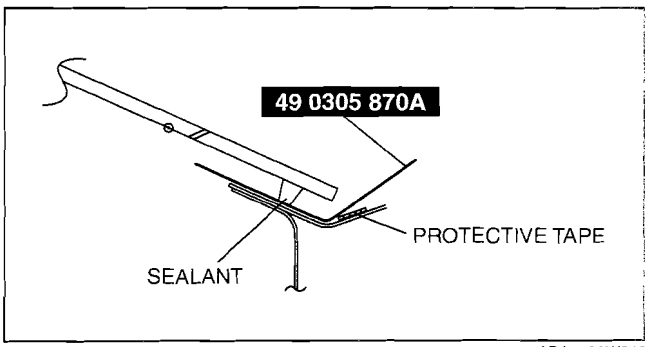


B3E0912W309

2. Pass the **SST** (piano wire), cut to sufficient length, through the hole.

Warning
- **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

3. Wind each end of the **SST** (piano wire) around a bar.

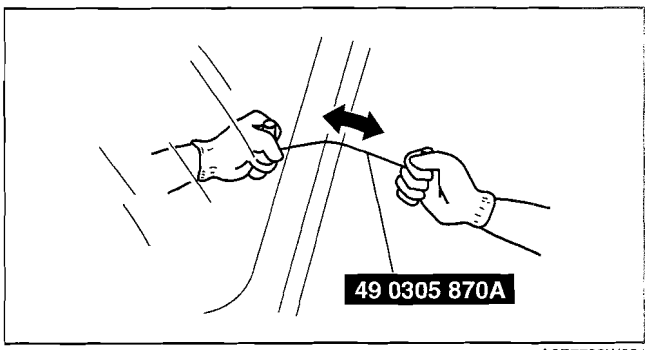


ADA7738W013

Note
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

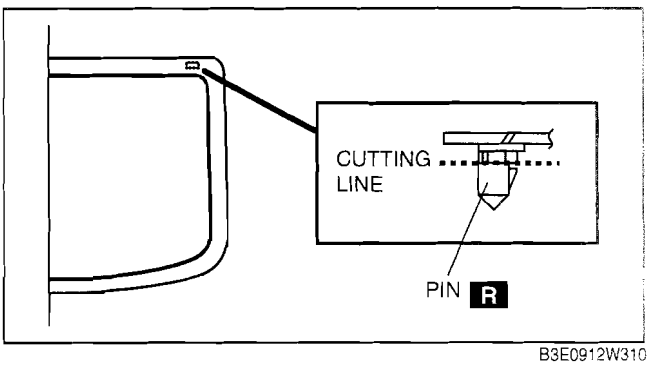
4. Fix one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the rear window glass.

Note
- As the upper part of the pin adheres to the sealant, cut it using the **SST** (piano wire).



A6E7738W021

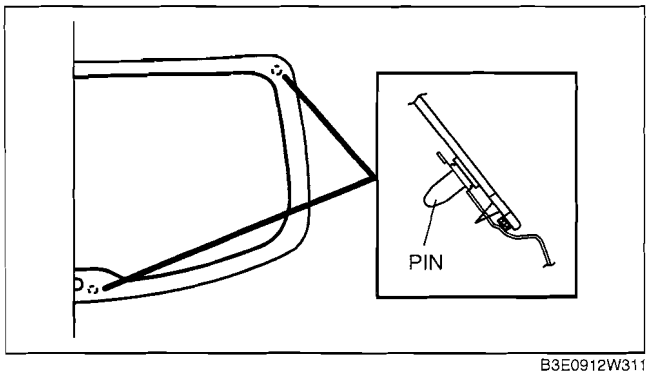
5. Cut the pins out.
6. Remove the rear window glass.
7. Mark the seating positions of the pins and remove the pins from the rear window glass.
8. Remove the rear window glass molding from the rear window glass.



B3E0912W310

5 Door

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Liftgate upper trim (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
   (2) Liftgate side trim (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Liftgate lower trim (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
   (4) High-mount brake light (See 09-18-16 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION.)
   (5) Rear wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (6) Rear wiper motor (See 09-19-13 REAR WIPER MOTOR REMOVAL/INSTALLATION.)
   (7) Rear spoiler (See 09-16-9 REAR SPOILER REMOVAL/INSTALLATION.)
3. Disconnect the filament connector.
4. Apply protective tape along the edge of the body.
5. Mark the position of the glass by affixing tape to the glass and body panel.
6. Make a hole through the sealant from the inside of the vehicle using an awl, avoiding the pins.



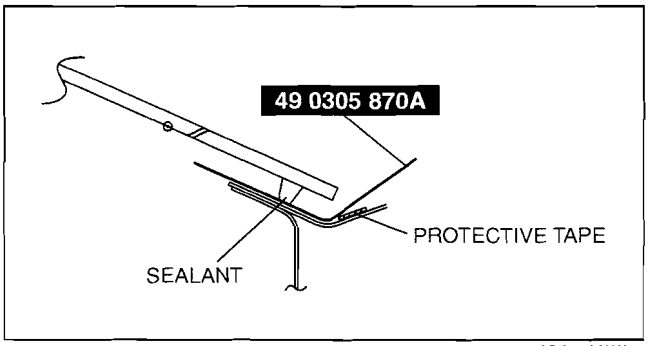
B3E0912W311

7. Pass the **SST** (piano wire), cut to sufficient length, through the hole.

   Warning
   - **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**

8. Wind each end of the **SST** (piano wire) around a bar.

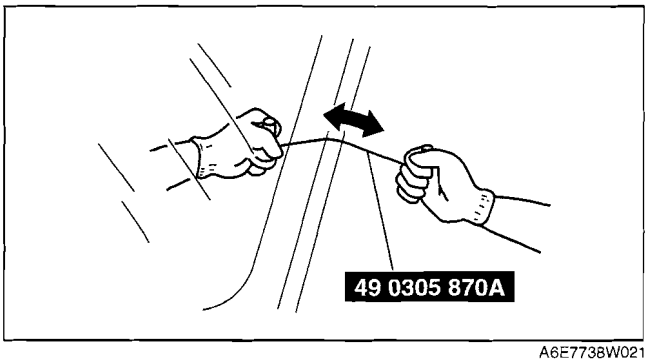
   Note
   - Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.



ADA7738W013

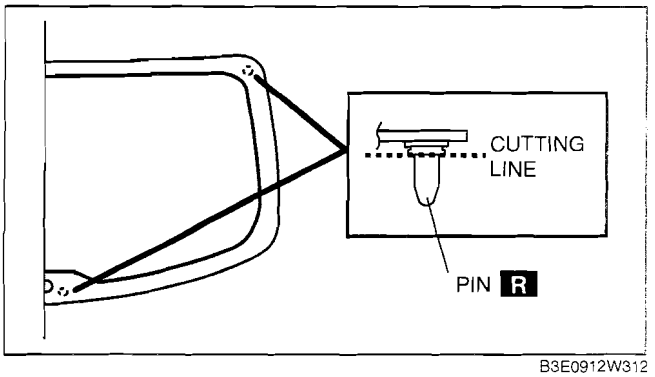
9. Fix one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the rear window glass.

   Note
   - As the upper part of the pin adheres to the sealant, cut it using the **SST** (piano wire).



A6E7738W021

10. Cut the pins out.
11. Remove the rear window glass.
12. Mark the seating positions of the pins and remove the pins from the rear window glass.



B3E0912W312

REAR WINDOW GLASS INSTALLATION

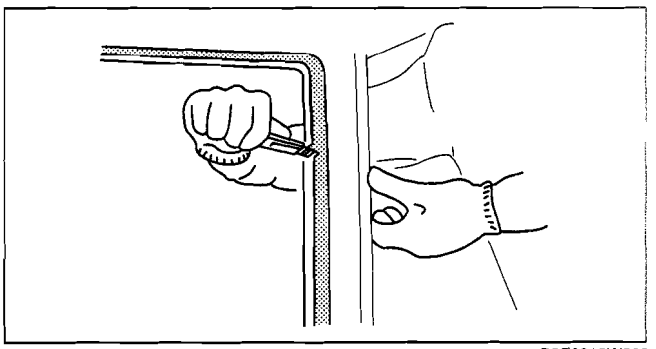
id091200801600

4 Door

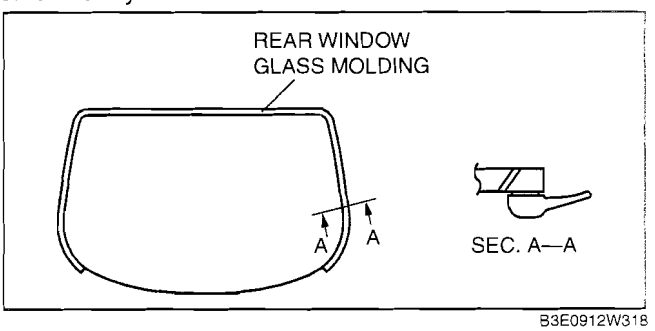
Caution
- **Proper installation of the rear window glass may be difficult if sealant is cracked or the glass is pushed out by air pressure when a door is opened/closed with all the window glass closed. Leave all the windows open until the rear window glass is installed completely.**

1. Cut away the old sealant using a razor so that a **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.

   Warning
   - **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**


B3E0912W222

2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it to dry for **approx. 30 min**. Then apply a **2 mm {0.08 in}** thickness of sealant.
3. Clean and degrease the perimeter **approx. 50 mm {1.97 in}** from the glass end and the bonding area on the body.
4. If installing a reused rear window glass, install the rear window glass molding according to the following procedure.
   (1) Clean and degrease the rear window glass molding installation area of the rear window glass.
   (2) Apply the glass primer to the rear window glass molding installation area of the rear window glass.

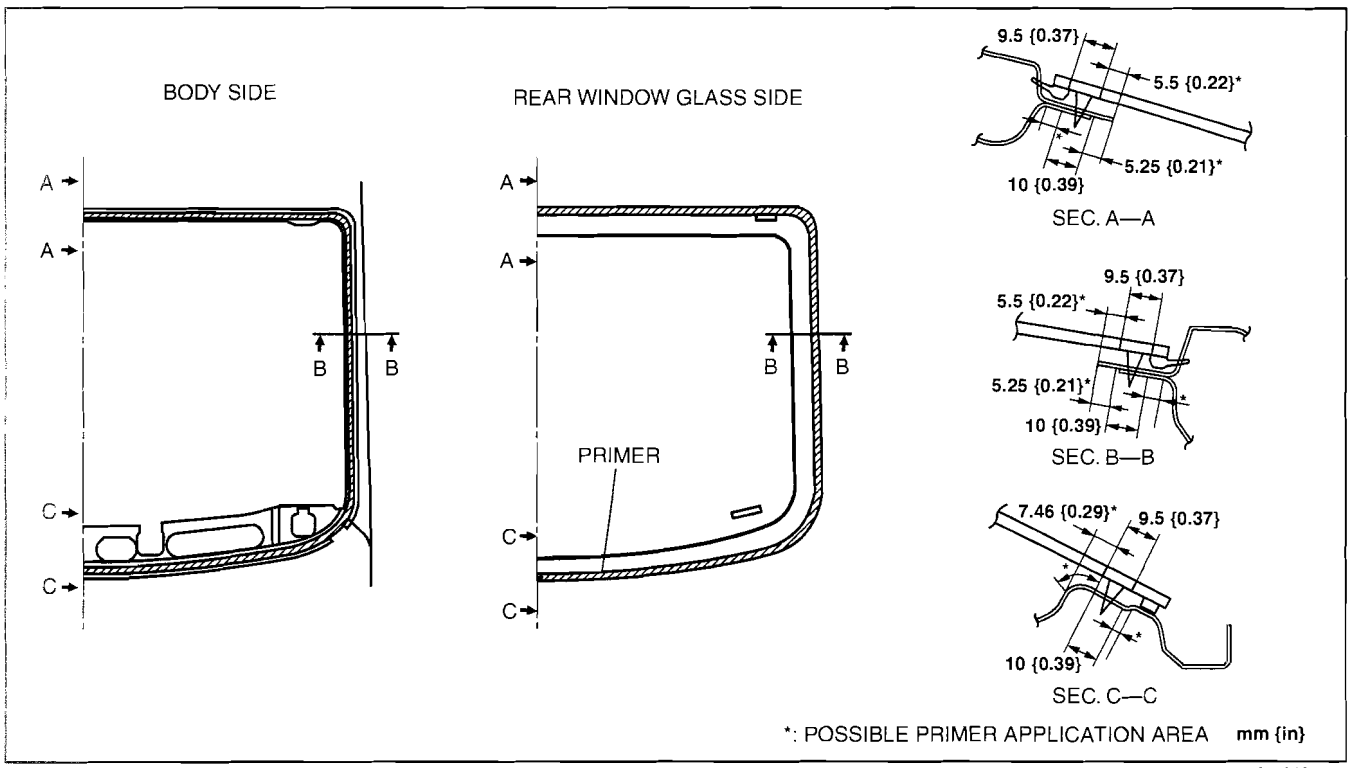


B3E0912W318

5. Apply glass primer on the rear window glass, and body primer on the rear window glass molding as shown in the figure. Allow it to dry for **approx. 30 min**.

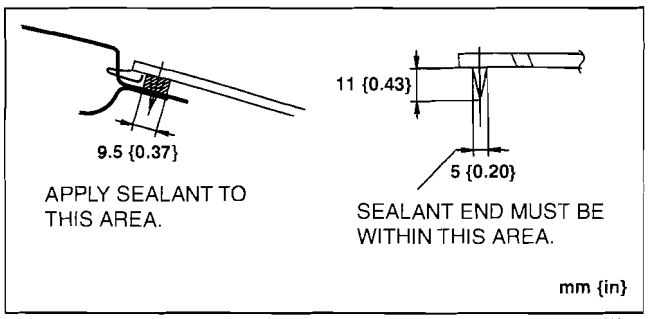
Caution

- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass and body, which may cause leakage.**



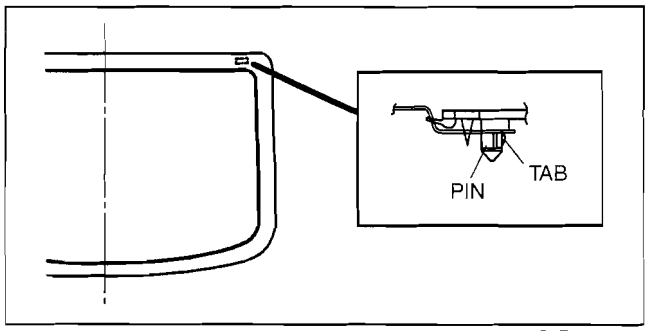
c3u0912w115

6. Apply sealant to the glass surface as shown in the figure.
7. Insert the positioning pins into the body, then install the rear window.



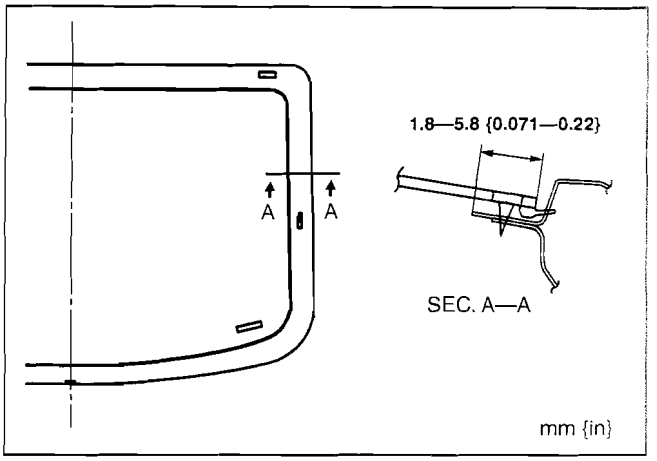
B3E0912W206

8. Press the rear window pins to engage the tabs to the body.



B3E0912W314

9. Press completely along the perimeter of the glass so that the measurement of the molding lip gap is within the specification.
10. Connect the filament connector.
11. Install the following parts:
    (1) Rear package trim (See 09-17-16 REAR PACKAGE TRIM REMOVAL/INSTALLATION.)
    (2) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
    (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
    (4) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
    (5) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
12. Allow the sealant to harden completely.



c3u0912w116

Sealant hardening time: 24 h

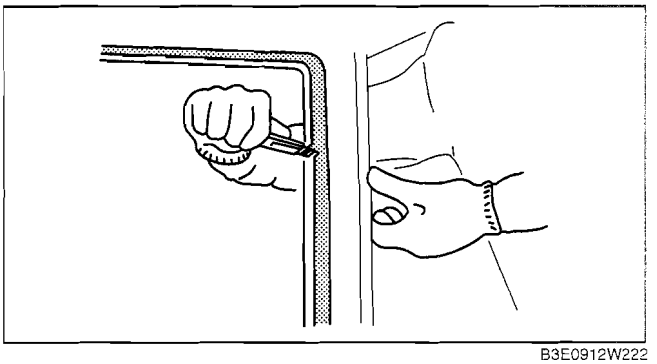
13. Apply soapy water to the rear window glass molding side and blow air from the interior, then verify that there are no bubbles or air leakage.
    - If there are any bubbles or air leakage, repair the damaged part of the sealant and verify it again.

5 Door

Caution
- **Proper installation of the rear window glass may be difficult if sealant is cracked or the glass is pushed out by air pressure when a door is opened/closed with all the window glass closed. Leave all the windows open until the rear window glass is installed completely.**

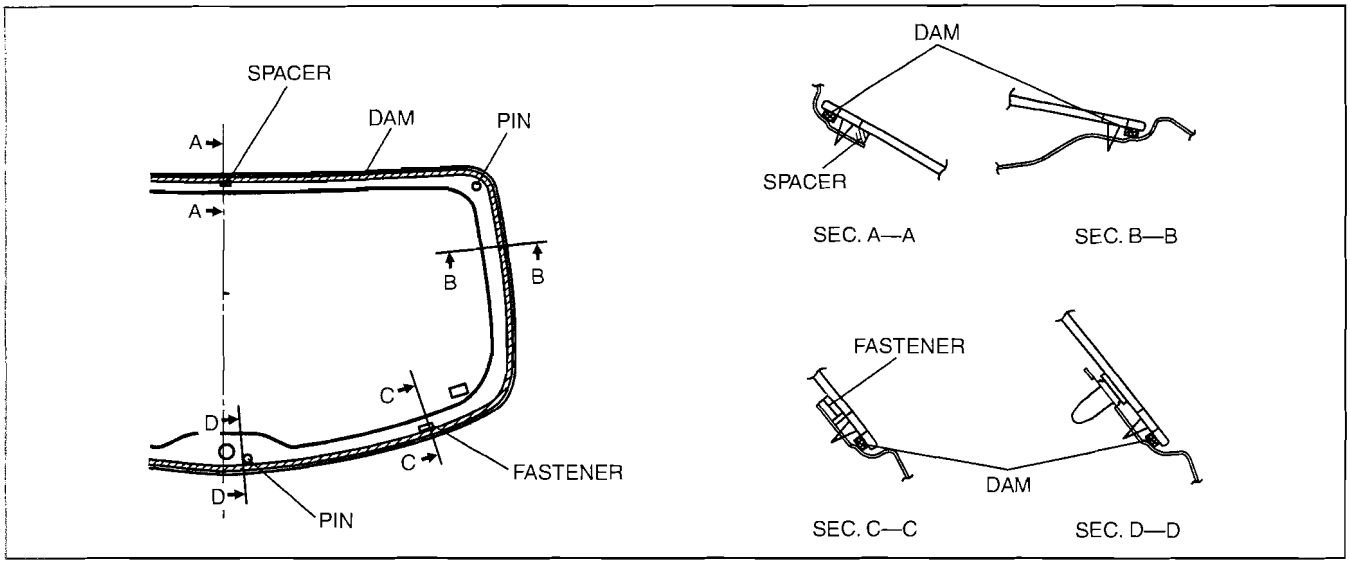
1. Cut away the old sealant using a razor so that a **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**


B3E0912W222

2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it to dry for **approx. 30 min**. Then apply a **2 mm {0.08 in}** thickness of sealant.
3. Clean and degrease the perimeter **approx. 50 mm {1.97 in}** from the glass end and the bonding area on the body.

4. Install the dam along the perimeter of the glass.



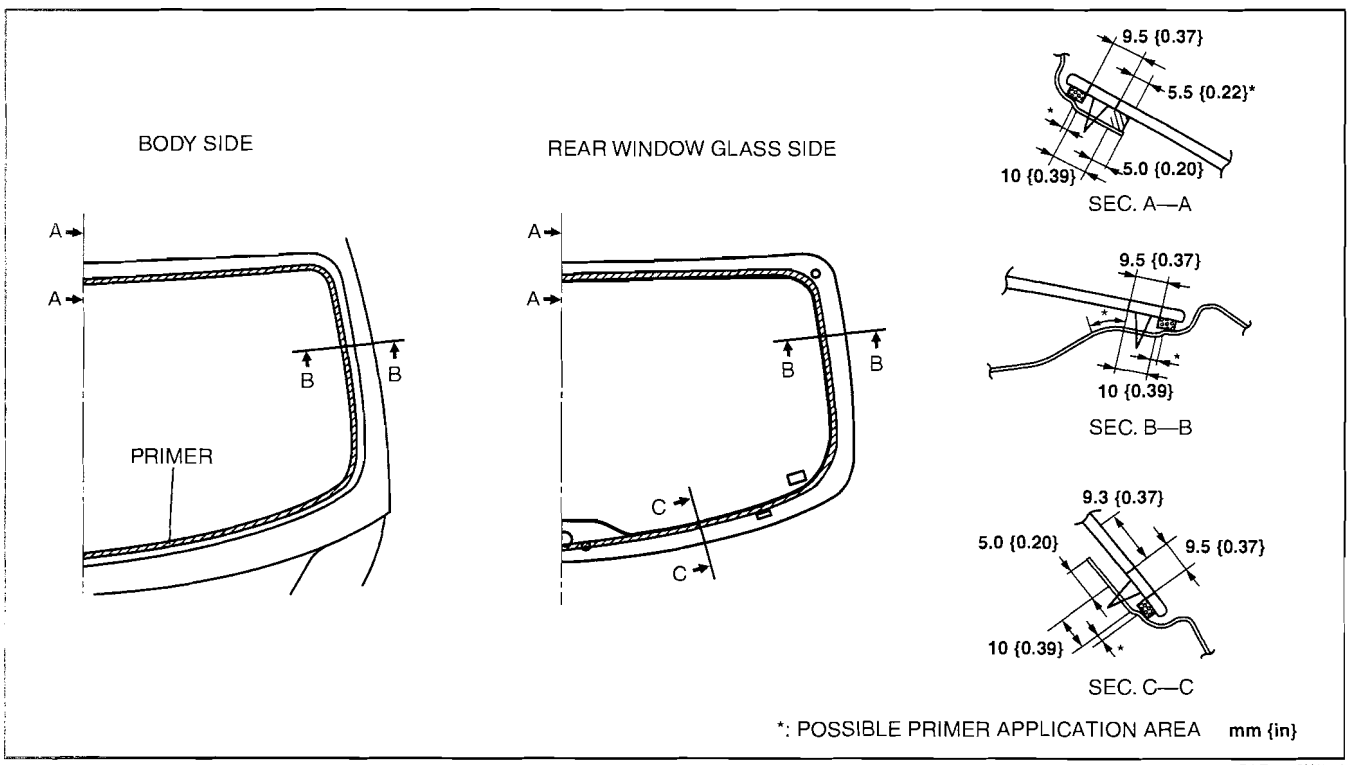
B3E0912W317

5. Attach the fasteners and spacer to the area shown in the figure.
6. Attach the pins to the seating positions where marked during removal.
7. Apply glass primer on the rear window glass, and body primer on the rear window glass molding as shown in the figure. Allow it to dry for **approx. 30 min**.

Caution

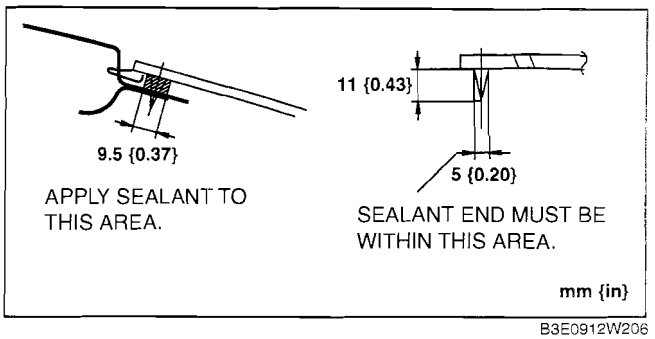
- **Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass and body, which may cause leakage.**

09-12



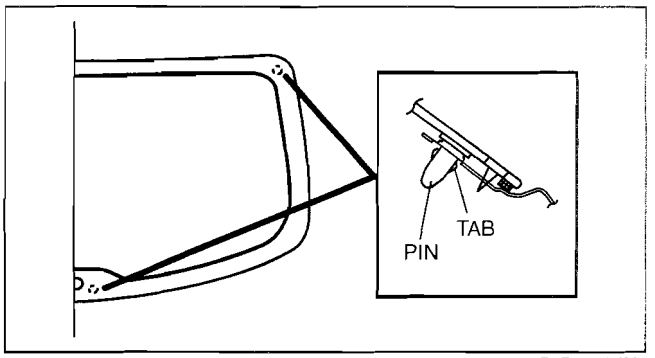
B3E0912W316

8. Apply sealant to the glass surface as shown in the figure.
9. Insert the positioning pins into the body, then install the rear window.



B3E0912W206

10. Press the rear window pins to engage the tabs to the body.
11. Press completely along the perimeter of the glass.
12. Connect the filament connector.
13. Install the following parts:
    (1) Rear spoiler (See 09-16-9 REAR SPOILER REMOVAL/INSTALLATION.)
    (2) Rear wiper motor (See 09-19-13 REAR WIPER MOTOR REMOVAL/INSTALLATION.)
    (3) Rear wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
    (4) High-mount brake light (See 09-18-16 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION.)
    (5) Liftgate lower trim (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
    (6) Liftgate side trim (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
    (7) Liftgate upper trim (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
14. Allow the sealant to harden completely.



B3E0912W207

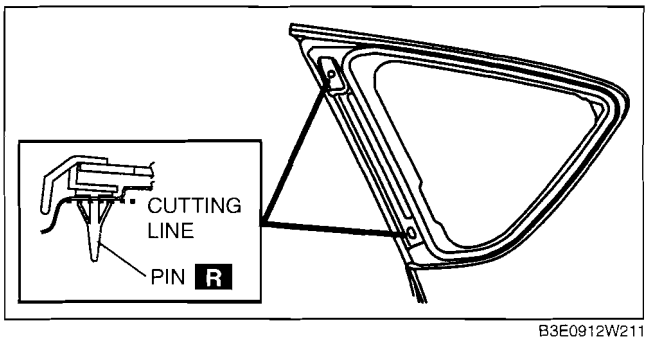
Sealant hardening time: 24 h

15. Apply soapy water to the rear window glass molding side and blow air from the interior, then verify that there are no bubbles or air leakage.
    - If there are any bubbles or air leakage, repair the damaged part of the sealant and verify it again.

QUARTER WINDOW GLASS REMOVAL

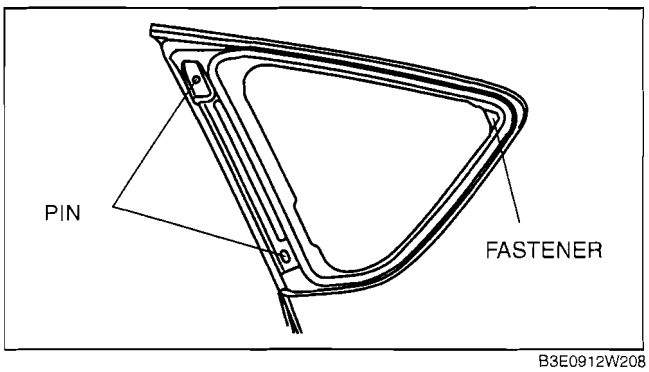
id091200801700

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (5) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
2. Set the headliner out of the way.
3. Apply protective tape along the edge of the body and the quarter window glass.
4. Cut off the pins.



B3E0912W211

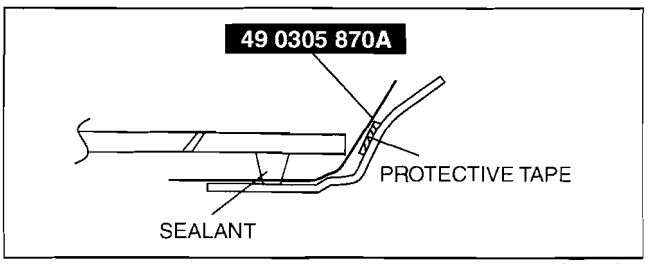
5. Make a hole through the sealant from the inside of the vehicle using an awl, avoiding the pins and fastener.



B3E0912W208

6. Pass the **SST** (piano wire), cut to sufficient length, through the hole.

   Warning
   - **Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).**



B3E0912W230

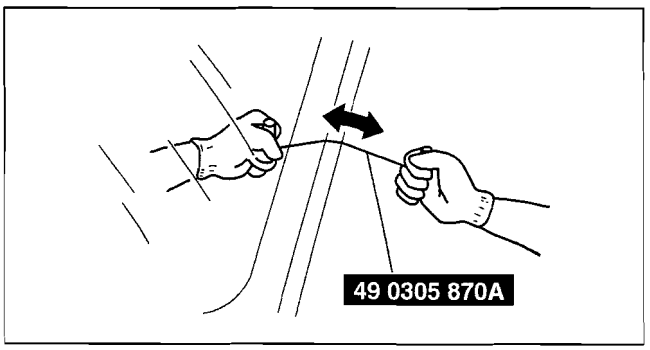
7. Wind each end of the **SST** (piano wire) around a bar.

   Note
   - Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

8. Fix one end of the SST (piano wire), and while pulling the other end, cut the sealant around the quarter window glass.

   Note
   - As the upper part of the pin adheres to the sealant, cut it using the **SST** (piano wire).

9. Remove the quarter window glass.



A6E7738W021

QUARTER WINDOW GLASS INSTALLATION

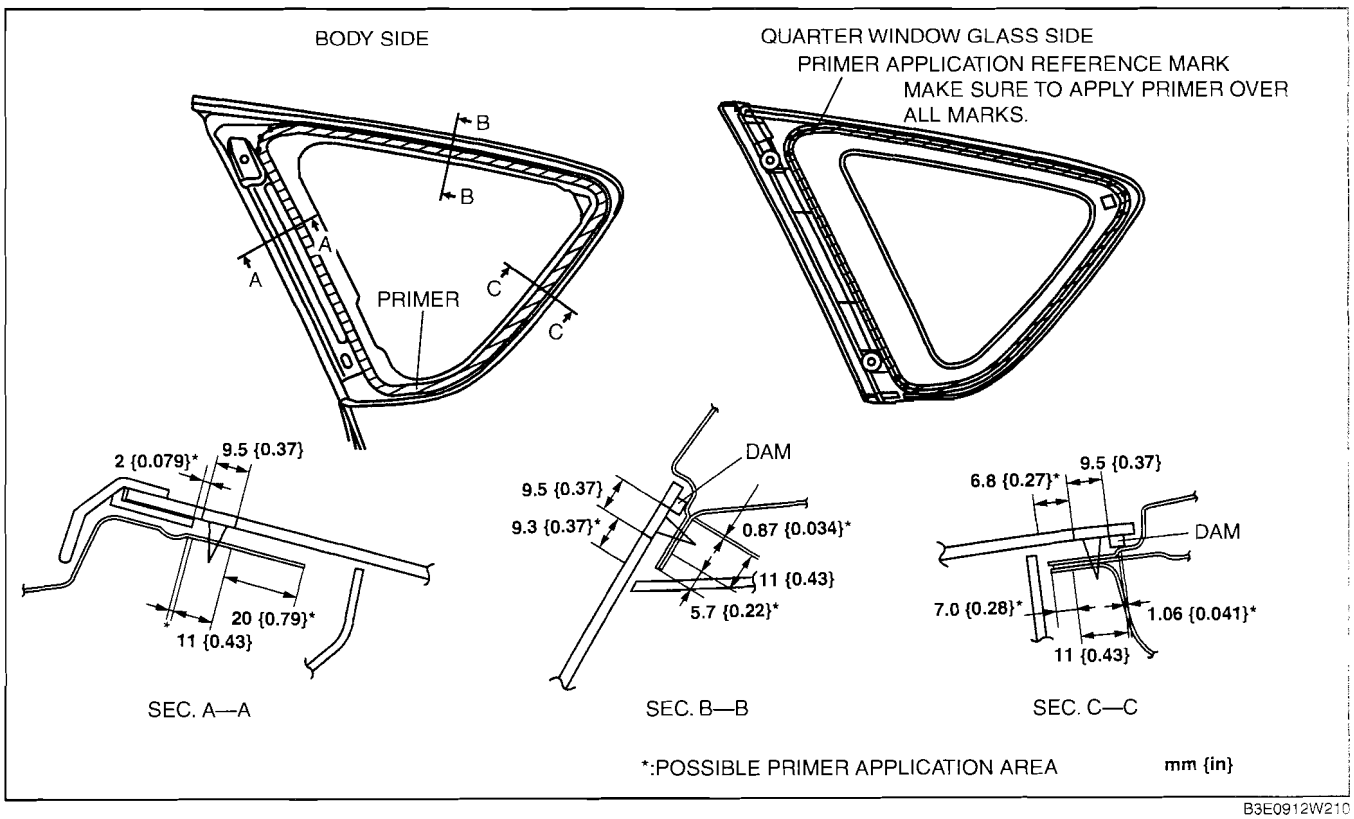
id091200801800

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Caution
- **Proper installation of the glass may be difficult if sealant is cracked or the glass is pushed out by air pressure when a door is opened/closed with all the window glass closed. Leave all the windows open until the quarter window glass is installed completely.**

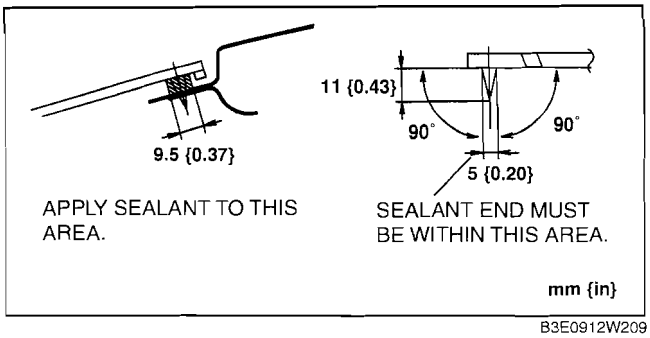
1. Cut away the old sealant using a razor so that **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.
2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approx. 30 min** to dry. Then apply **2 mm {0.08 in}** thickness of new sealant.
3. Clean and degrease an **approx. 50 mm {2.0 in}** wide strip along the perimeter of the glass and the bonding area on the body.
4. Install the dam along the perimeter of the glass.
5. Use only glass primer on the quarter window glass, and body primer on the body, then allow it to dry for **approx. 30 min**.

Caution
- **To prevent weakening of the primer adhesion, keep the bonding surface free of dirt, moisture, and grease. Do not touch the surface with your hand.**



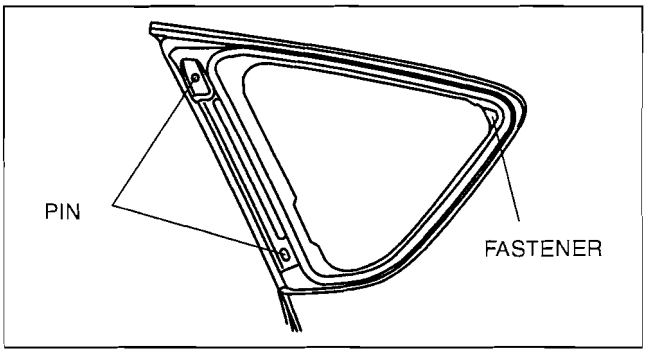
B3E0912W210

6. Apply sealant to the area of the glass surface as shown in the figure.



B3E0912W209

7. Insert the positioning pins and fastener to the body and install the quarter window glass.
8. Press the areas where the pins are located on the quarter window glass to allow the pin tabs to be engaged with the body.
9. Install the following parts:
   (1) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
10. Allow the sealant to harden completely.



B3E0912W208

Sealant hardening time: 24 h

FILAMENT INSPECTION

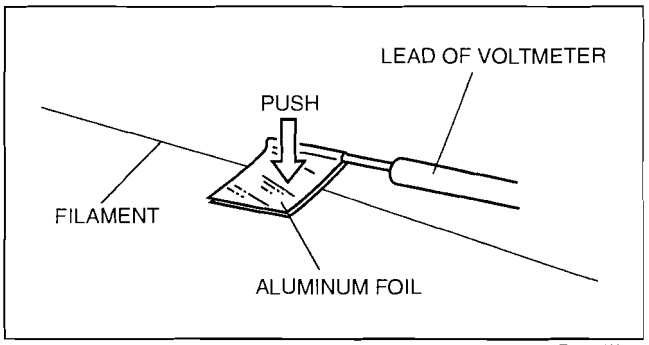
id091200801000

1. Turn the ignition switch to the ON position.
2. Turn the rear window defroster switch on.

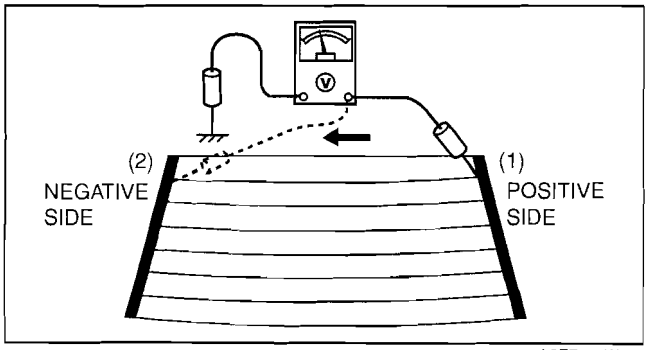
Caution
- **Directly touching the rear window defroster filament with the lead of the tester could damage it. Wrap aluminum foil around the end of the lead and inspect the filament by touching it with the foil.**

3. Connect the positive lead of the tester to the positive side of each filament and the negative lead to ground.
4. Gradually slide the positive lead from the positive side to the negative side and verify that the voltage decreases accordingly.
   - If the voltage changes rapidly, the filament has a malfunction. Repair the filament.

Measured part	Voltage (Reference)
(1) to (2)	Approx. 12 V to 0 V



A6E7736W001



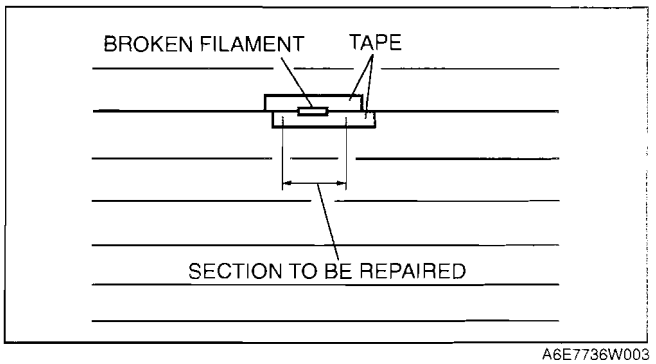
A6E7736W002

FILAMENT REPAIR

id091200801100

1. Clean the filament using isopropyl alcohol.
2. Attach tape to both sides of the filament.
3. Using a small brush or marking pen, apply silver paint.
4. After **2—3 min**, carefully remove the tape without damaging the applied area.

Caution
- **Do not operate the rear window defroster until the paint is completely dry. It may cause other malfunctions if it is used before the paint is dry.**



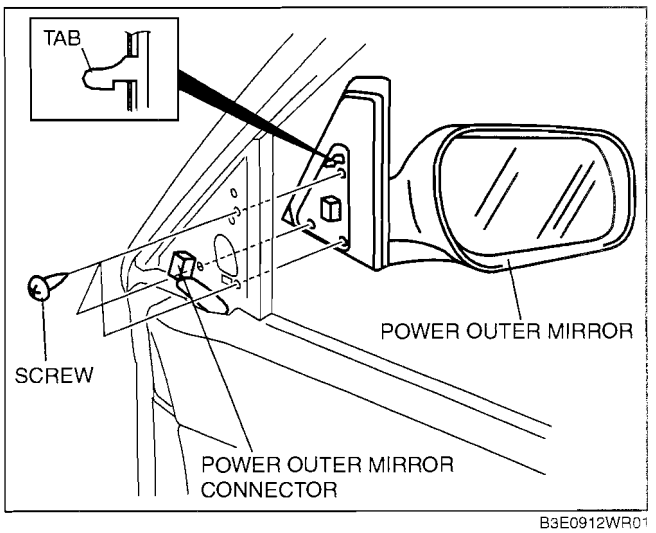
A6E7736W003

5. Dry the repaired part according to the following procedure.
   - When the room temperature is **25 °C {77 °F}**, leave it as it is for **24 h**.
   - When a hot air blower is used, dry with the **150 °C {302 °F}** air for **30 min**.

POWER OUTER MIRROR REMOVAL/INSTALLATION

id091200802500

1. Disconnect the negative battery cable.
2. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
3. Disconnect the power outer mirror connector.
4. Remove the screws.
5. Push the power outer mirror against the vehicle and detach the tab while lifting the mirror up to remove.
6. Install in the reverse order of removal.

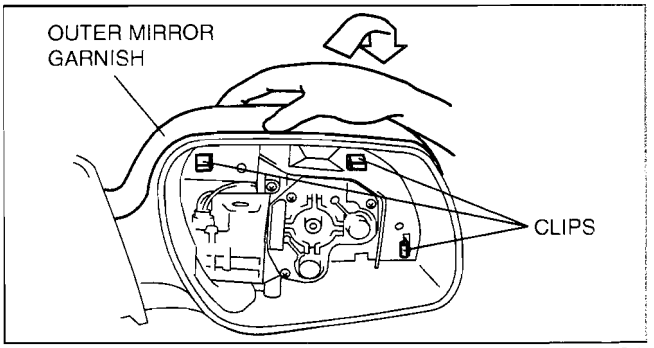


B3E0912WR01

OUTER MIRROR GARNISH REMOVAL

id091200802800

1. Remove the mirror glass from the outer mirror.
2. Pinch the clip ends using pincers and detach the clips by pushing them forward.
3. Grasp the upper side of the outer mirror garnish and remove it by pulling it in the direction of the arrow.

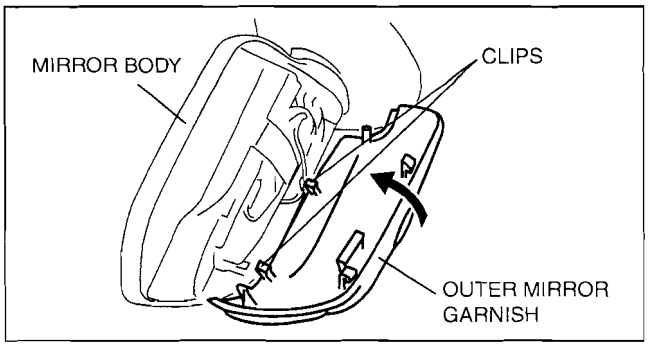


c3u912zw5si1

OUTER MIRROR GARNISH INSTALLATION

1. Position the outer mirror garnish against the mirror body in the direction of the arrow shown in the figure, and insert the outer mirror garnish clips (6 locations) into the mirror body.
2. Install the outer mirror garnish so that there are no gaps around the component.

id091200802900



c3u912zw5si2

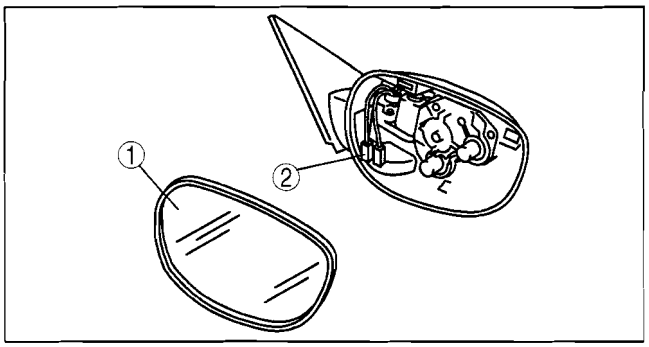
POWER OUTER MIRROR DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Outer mirror glass (See 09-12-33 Outer Mirror Glass Disassembly Note09-12-33 Outer Mirror Glass Disassembly Note.) (See 09-12-34 Outer Mirror Glass Assembly Note09-12-34 Outer Mirror Glass Assembly Note.)
2	Connector (Vehicles with heated outer mirrors)

2. Assemble in the reverse order of disassembly.

id091200807300

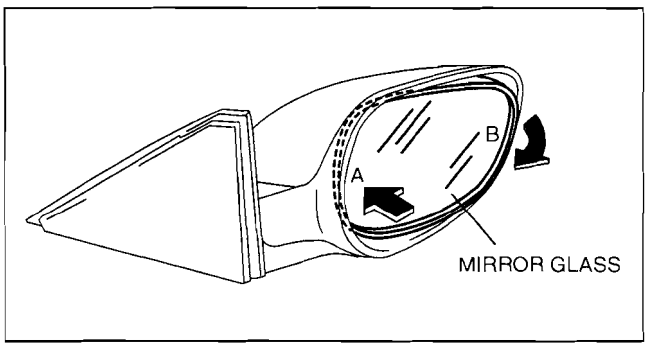


am3uuw0000082

09-12

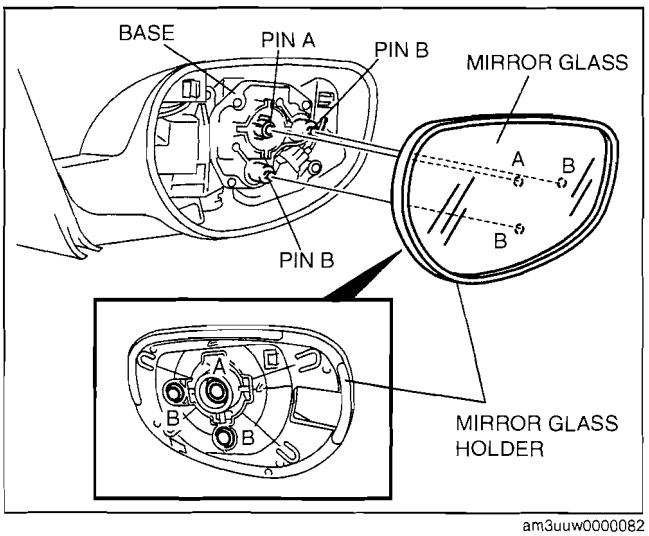
Outer Mirror Glass Disassembly Note

1. Press area A of the mirror glass so that area B moves outward.



am3uuw0000082

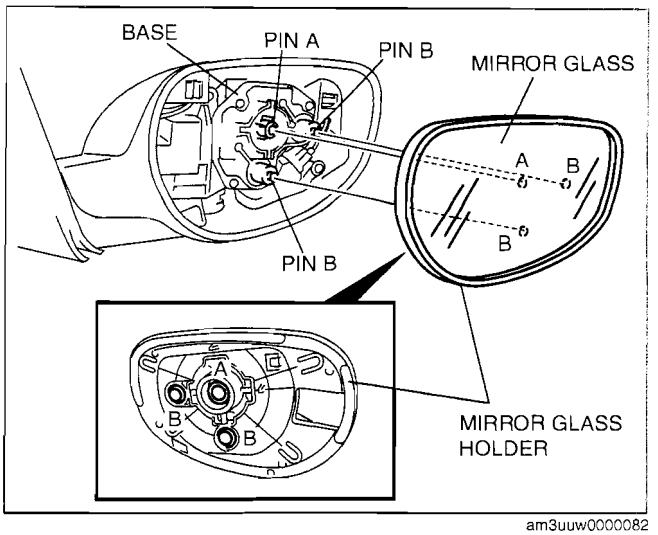
2. Detach pin A while lifting up the inside of the mirror glass holder.
3. Pull out the mirror glass holder and detach pins B.
4. Remove the mirror glass holder and the mirror glass as a single unit.



am3uuw0000082

Outer Mirror Glass Assembly Note

1. Press area A of the mirror glass into the base to attach pin A.
2. Press areas B of the mirror glass into the base to attach pins B.



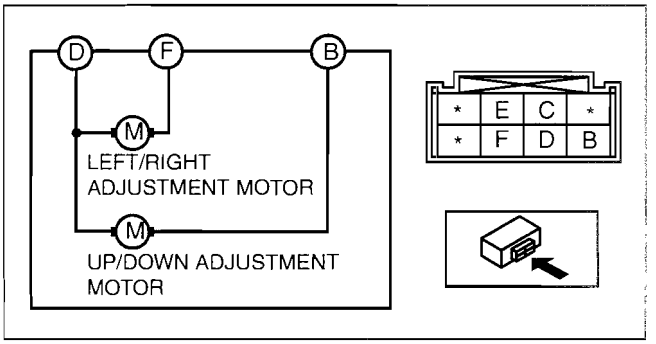
am3uuw0000082

POWER OUTER MIRROR INSPECTION

1. Apply battery positive voltage to the power outer mirror terminals and inspect the operation of the power outer mirror.
   - If not as specified, replace the power outer mirror.

Mirror operation	Terminal	
	B+	GND
Up	B	D
Down	D	B
Left	F	D
Right	D	F

id091200803000



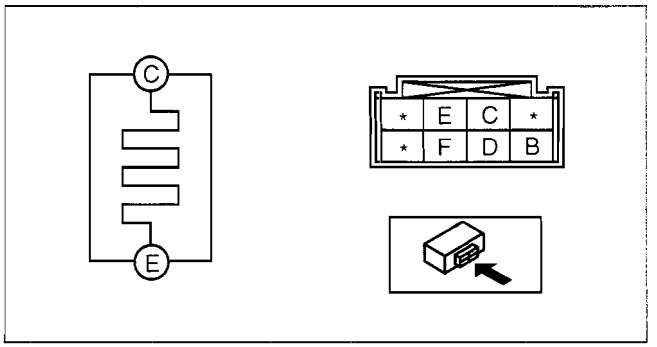
B3E0912WR05

2. Inspect for continuity between the power outer mirror heater terminals.
   - If not as specified, replace the power outer mirror.

O—O : Continuity

Mirror operation	Terminal	
	C	E
Heater	O	O

A6E7732W010

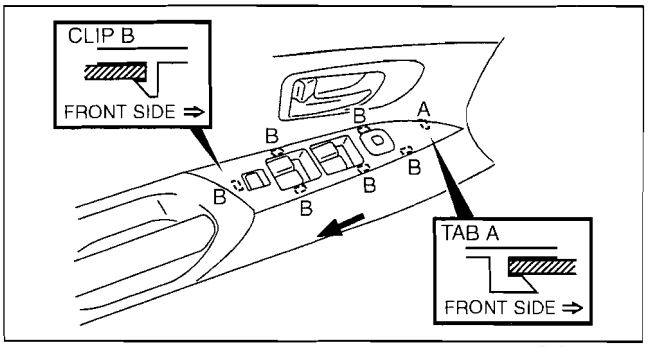


B3E0912WR06

POWER OUTER MIRROR SWITCH REMOVAL/INSTALLATION

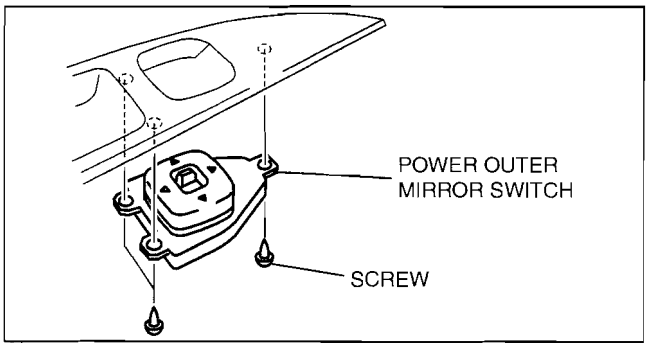
id091200802300

1. Disconnect the negative battery cable.
2. Remove the clips B using a flathead screwdriver wrapped with protective tape.
3. Remove the switch panel from the front door trim while sliding it in the direction of the arrow as shown in the figure.
4. Disconnect the power window main switch connector and the power outer mirror switch connector.



B3E0912W109

5. Remove the screws, then remove the power outer mirror switch.
6. Install in the reverse order of removal.



B3E0912WR04

09-12

POWER OUTER MIRROR SWITCH INSPECTION

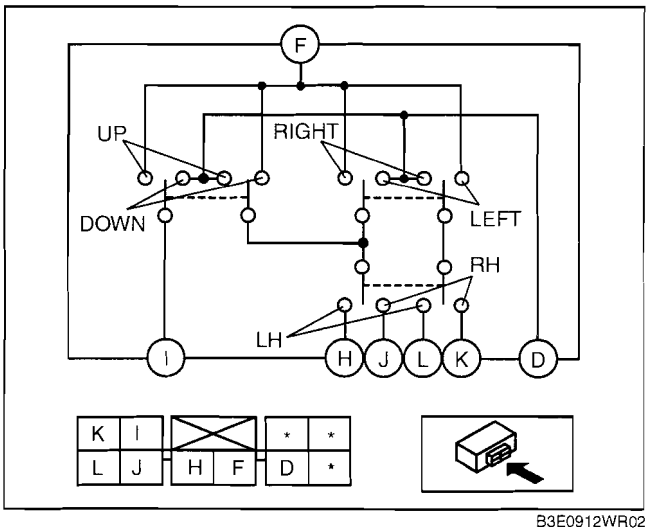
id091200802400

1. Inspect for continuity between the power outer mirror switch terminals.
   - If not as specified, replace the power outer mirror switch.

○—○ : Continuity

Operation		F	D	H	L	J	K	I
LH	Up	○		○				○
	Down	○		○				○
	Left	○		○	○			
	Right	○		○	○			
RH	Up	○				○		○
	Down	○				○		○
	Left	○				○	○	
	Right	○				○	○	

B3E0912WR03

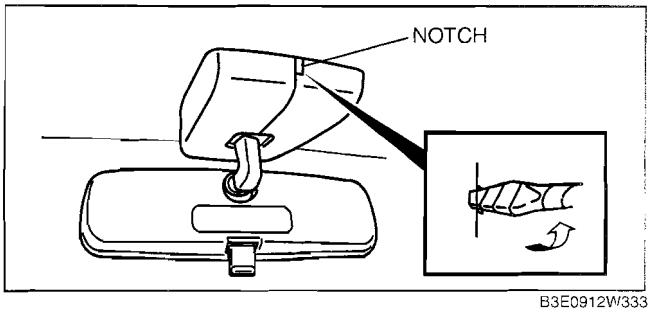


B3E0912WR02

REARVIEW MIRROR REMOVAL/INSTALLATION

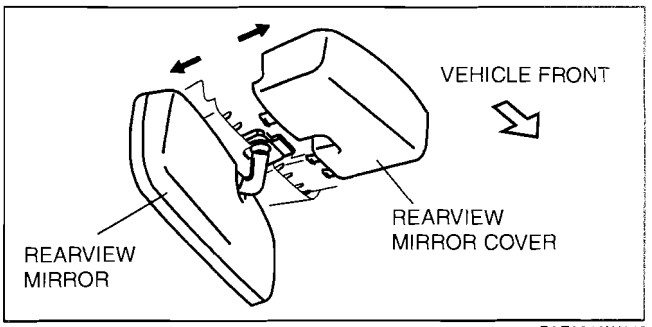
id091200803100

1. Insert a tape-wrapped flathead screwdriver into the notch and pry with the screwdriver in the direction shown by the arrow to remove the covers. (Vehicles with auto wiper system)



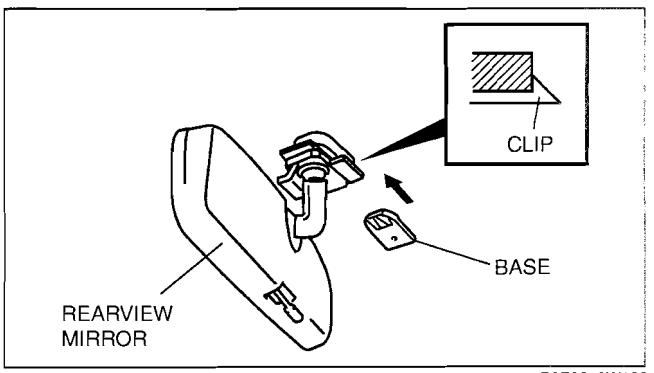
B3E0912W333

2. Remove the covers. (Vehicles with auto wiper system)
3. Remove the rain sensor. (Vehicles with auto wiper system) (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)



B3E0912W119

4. Remove the clip, and then remove the rearview mirror upward.
5. Install in the reverse order of removal.

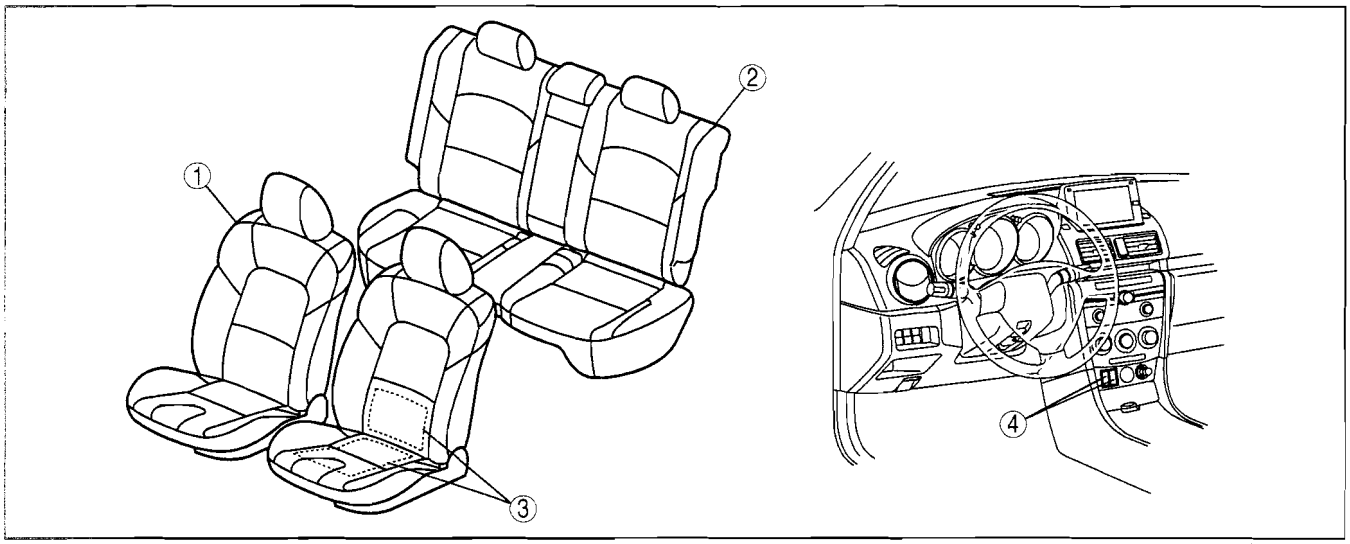


B3E0912W122

09-13 SEATS

SEATS LOCATION INDEX

id091300803000



d3u913zwa000

1	Front seat (See 09-13-2 FRONT SEAT REMOVAL/ INSTALLATION.) (See 09-13-3 FRONT SEAT DISASSEMBLY/ ASSEMBLY.)
2	Rear seat (See 09-13-6 REAR SEAT REMOVAL/ INSTALLATION.) (See 09-13-7 REAR SEAT DISASSEMBLY/ ASSEMBLY.)

3	Seat warmer unit (See 09-13-9 SEAT WARMER UNIT INSPECTION.)
4	Seat warmer switch (See 09-13-8 SEAT WARMER SWITCH REMOVAL/ INSTALLATION.) (See 09-13-8 SEAT WARMER SWITCH INSPECTION.)

FRONT SEAT REMOVAL/INSTALLATION

id091300800200

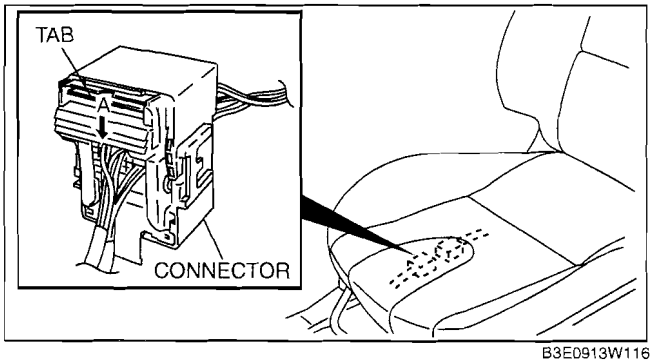
Warning

- **Handling the front seat (side air bag) improperly can accidently deploy the side air bag, which may seriously injure you. Read service warnings and cautions before handling the front seat. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS, 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

Caution

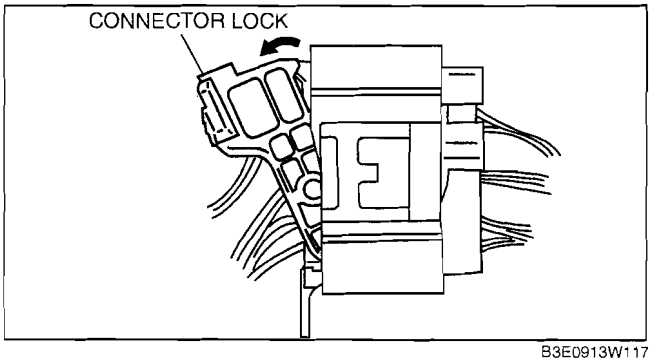
- **For vehicles with the two-step deployment air bag system, when the passenger's seat is removed, perform the seat weight sensor inspection using the M-MDS after installing the passenger's seat. (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)**
- **For vehicles with the two-step deployment air bag system, when the passenger's seat is replaced with a new one, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Press connector tab A in the direction of the arrow.



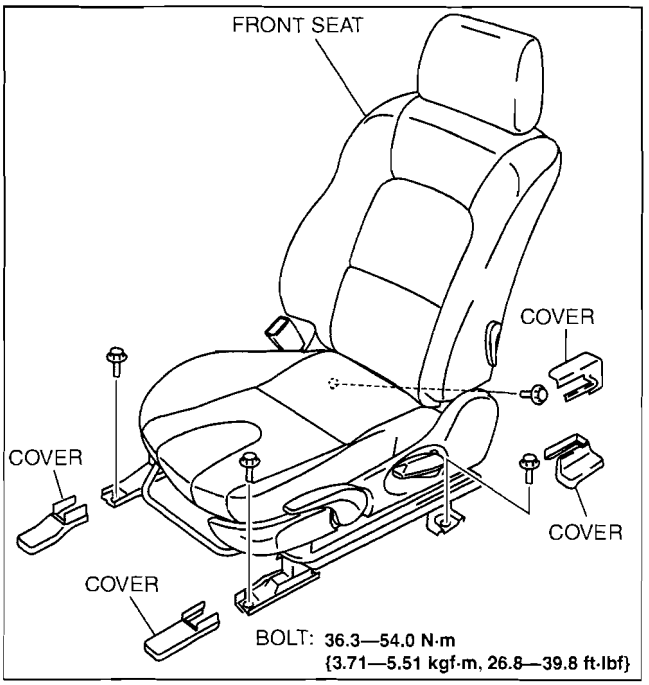
B3E0913W116

4. Pull out the connector lock in the direction of the arrow and disconnect the connector.
5. Remove the seat belt anchor (RH). (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)



B3E0913W117

6. Remove the covers.
7. Remove the bolts, then remove the front seat.
8. Install in the reverse order of removal.
9. Perform the weight sensor initialization procedure. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)



c3u0913w102

FRONT SEAT DISASSEMBLY/ASSEMBLY

id091300800300

Warning

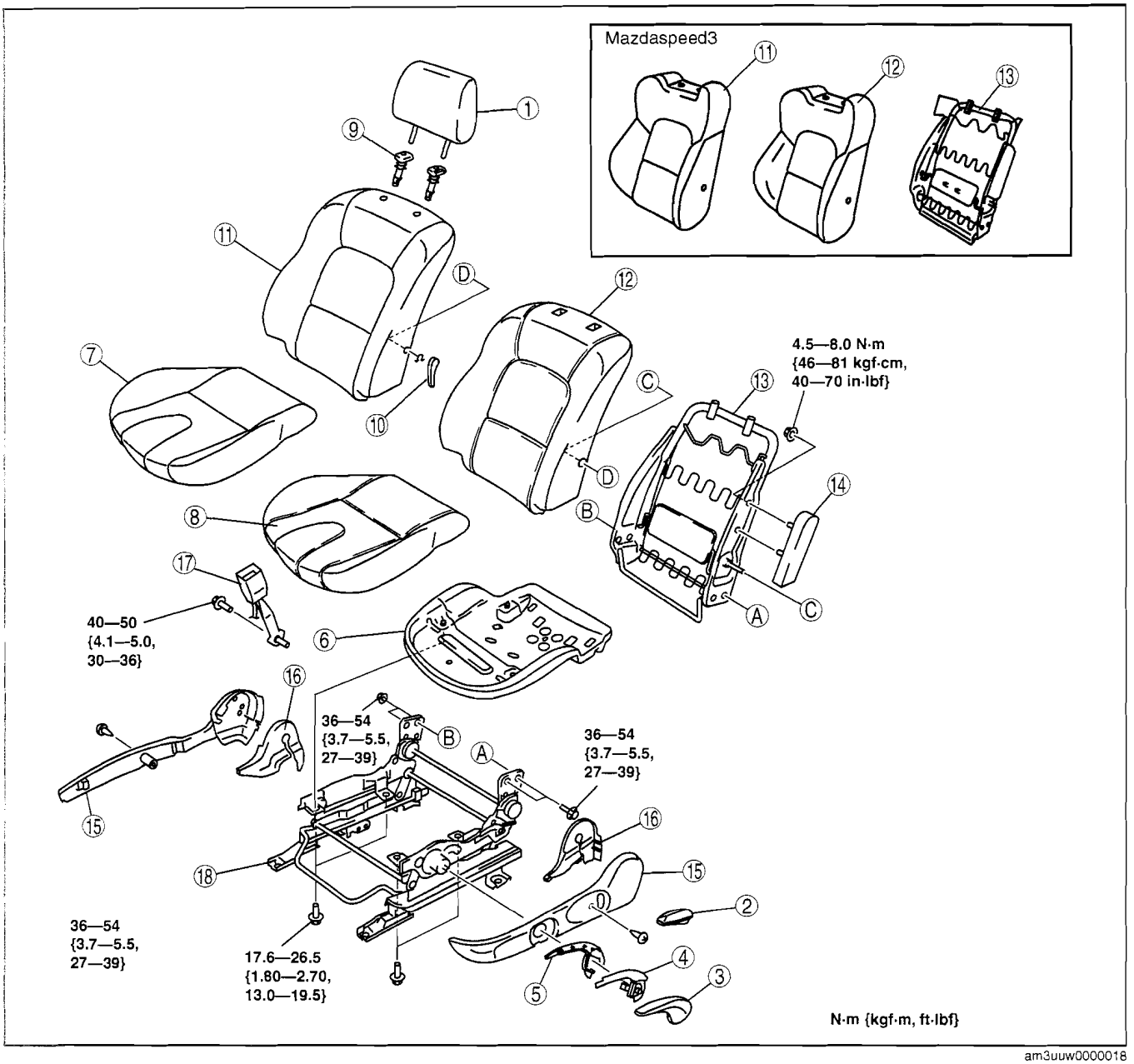
- **Handling the front seat (side air bag, seat weight sensor) improperly can accidentally deploy the side air bag, which may seriously injure you. Read the service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

Caution

- **For vehicles with the two-step deployment air bag system, if any of the following work is performed, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**
  - **— Replacement with a new seat weight sensor**
  - **— Replacement with a new seat weight sensor control module**
  - **— Replacement with new passenger-side seat parts**
  - **— Disassembly of the passenger-side seat**
- **For vehicles with the two-step deployment air bag system, if any of the following work is performed, perform the seat weight sensor inspection using the M-MDS. (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)**
  - **— Removal of the passenger-side seat**
  - **— Loosening and retightening of passenger's seat fixing bolts**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

Driver's Seat

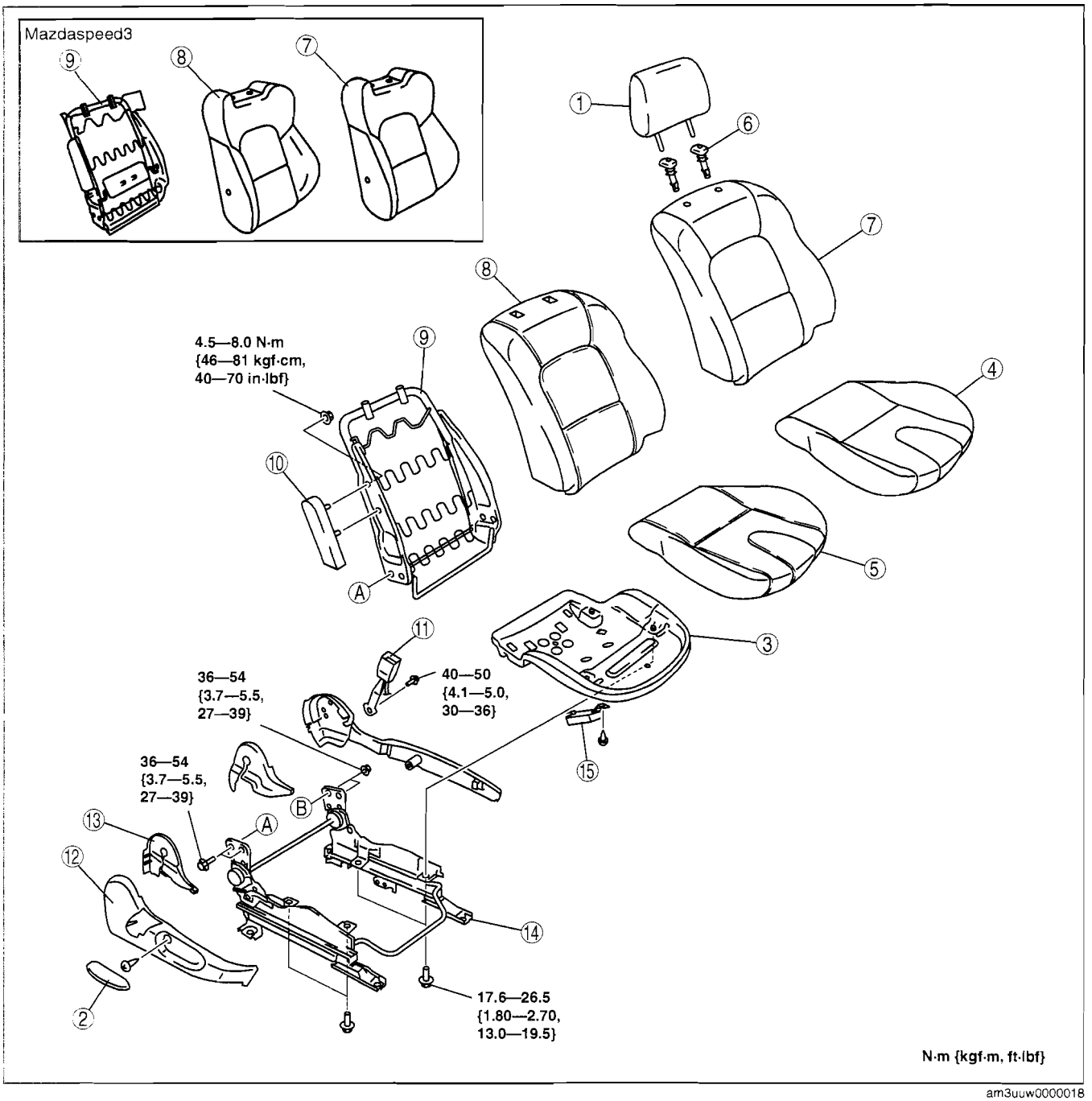


am3uuw0000018

1	Headrest
2	Recliner lever
3	Outer lift lever cover
4	Lift lever
5	Inner lift lever cover
6	Seat cushion frame
7	Seat cushion trim
8	Seat cushion pad
9	Pole guide
10	Lumbar support lever

11	Seat back frame
12	Seat back trim
13	Seat back pad
14	Side air bag module (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
15	Side cover
16	Reverse cover
17	Front buckle
18	Slide adjuster

Passenger's Seat



am3uuw0000018

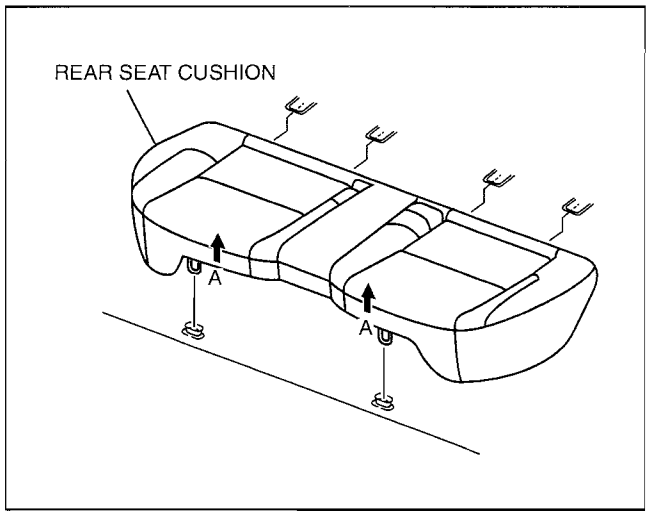
1	Headrest
2	Recliner lever
3	Seat cushion frame
4	Seat cushion trim
5	Seat cushion pad
6	Pole guide
7	Seat back trim
8	Seat back pad

9	Seat back frame
10	Side air bag module (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
11	Front buckle
12	Side cover
13	Reverse cover
14	Slide adjuster
15	Seat weight sensor control module

REAR SEAT REMOVAL/INSTALLATION

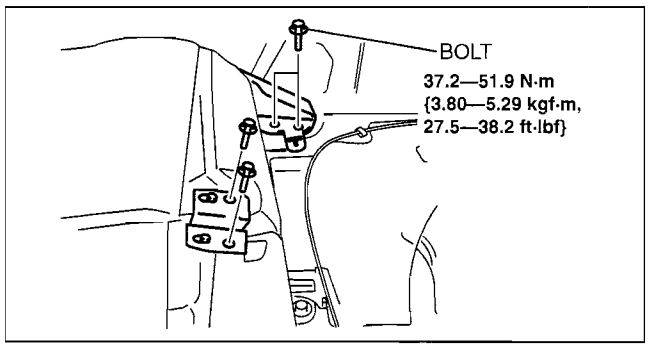
id091300800400

1. Lift points A in the direction of the arrows and remove the rear seat cushion.
2. Fold the rear seat back.



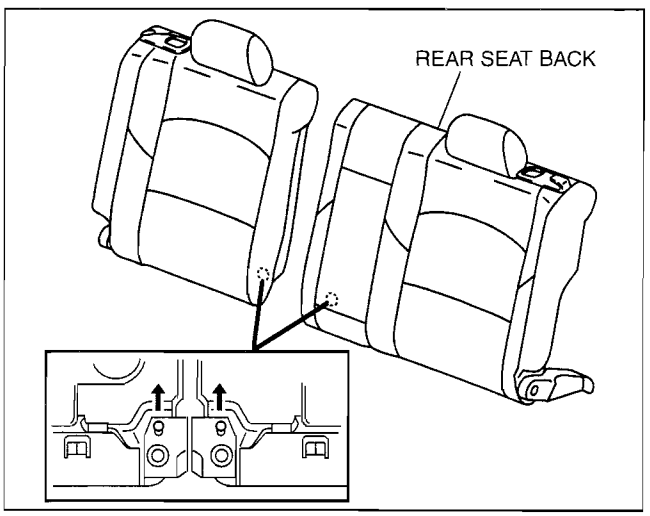
B3E0913W113

3. Remove the bolts.



B3E0913W114

4. Raise the rear seat back in the direction of the arrows and detach the connecting part between the rear seat back and bracket.
5. Remove the rear seat back.
6. Install in the reverse order of removal.

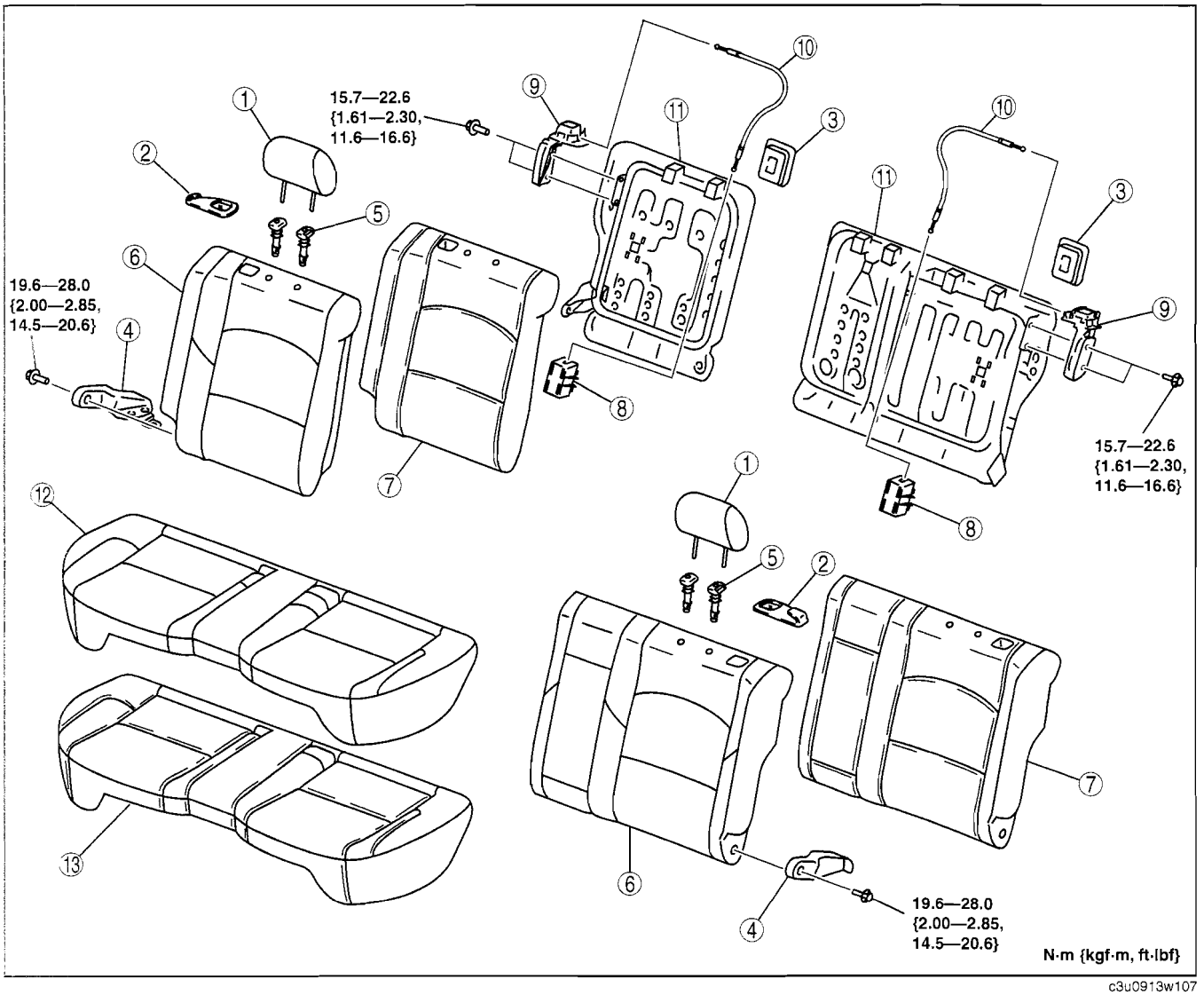


c3u0913w106

REAR SEAT DISASSEMBLY/ASSEMBLY

id091300800500

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



c3u0913w107

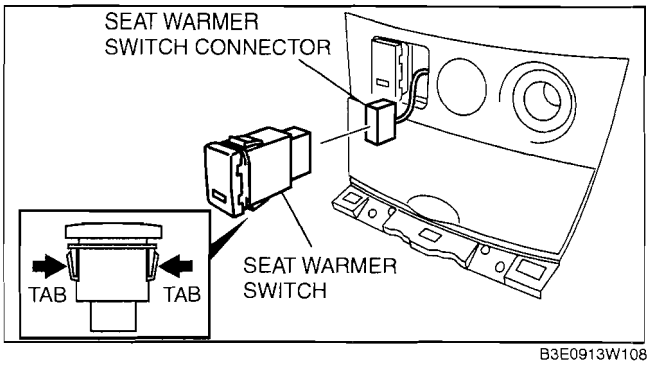
1	Headrest
2	Fold-down switch cover
3	Rear seat back lock cover
4	Rear seat back side hinge
5	Pole guide
6	Rear seat back trim
7	Rear seat back pad

8	Rear seat back lock
9	Fold-down switch
10	Remote wire
11	Rear seat back frame
12	Rear seat cushion trim
13	Rear seat cushion pad

SEAT WARMER SWITCH REMOVAL/INSTALLATION

id091300801200

1. Disconnect the negative battery cable.
2. Remove the ashtray panel. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Disconnect the connector.
4. Squeeze the tabs of seat warmer switch and pull it outward to remove it.
5. Install in the reverse order of removal.

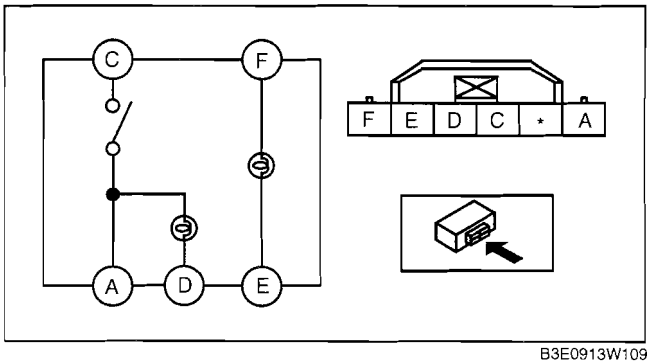


B3E0913W108

SEAT WARMER SWITCH INSPECTION

id091300801300

1. Verify that the continuity between the seat warmer switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the seat warmer switch.



B3E0913W109

○—○ : Continuity ○-⊗-○ : Bulb

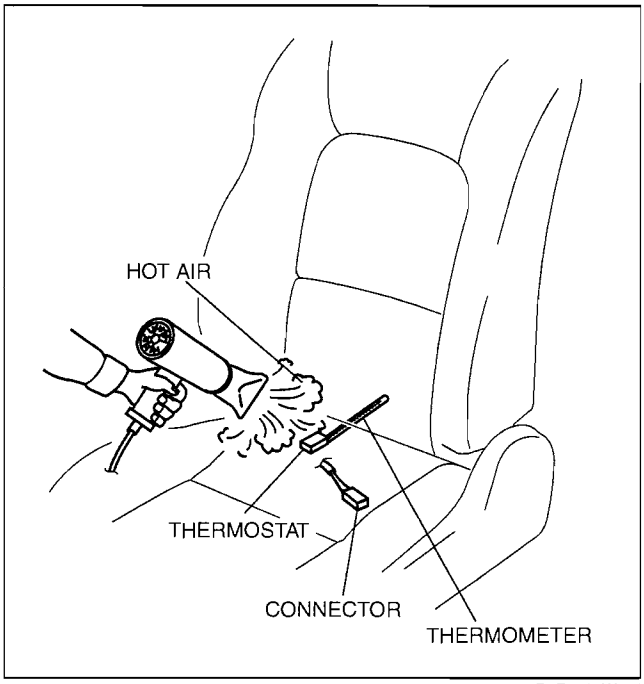
Switch position	Terminal				
	C	A	D	E	F
On	○	○	⊗	○	○
Off				○	○

B3E0913W110

SEAT WARMER UNIT INSPECTION

id091300801400

1. Remove the front seat. (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
2. Remove the seat cushion trim. (See 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.)
3. While inspecting for continuity between the terminals A and B of the connector, use a dryer to warm the thermostat of the seat warmer unit on seat cushion.



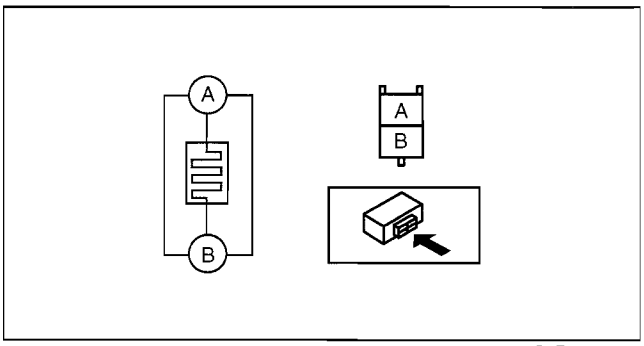
B3E0913W111

4. Verify that the continuity between the seat warmer terminals is as indicated in the table.
   - If not as indicated in the table, replace the seat warmer switch.

O—O : Continuity

Thermostat temperature	Terminal	
	A	B
More than approx. 37 °C {99 °F}		
Less than approx. 27 °C {81 °F}	O	O

B3E0913W115



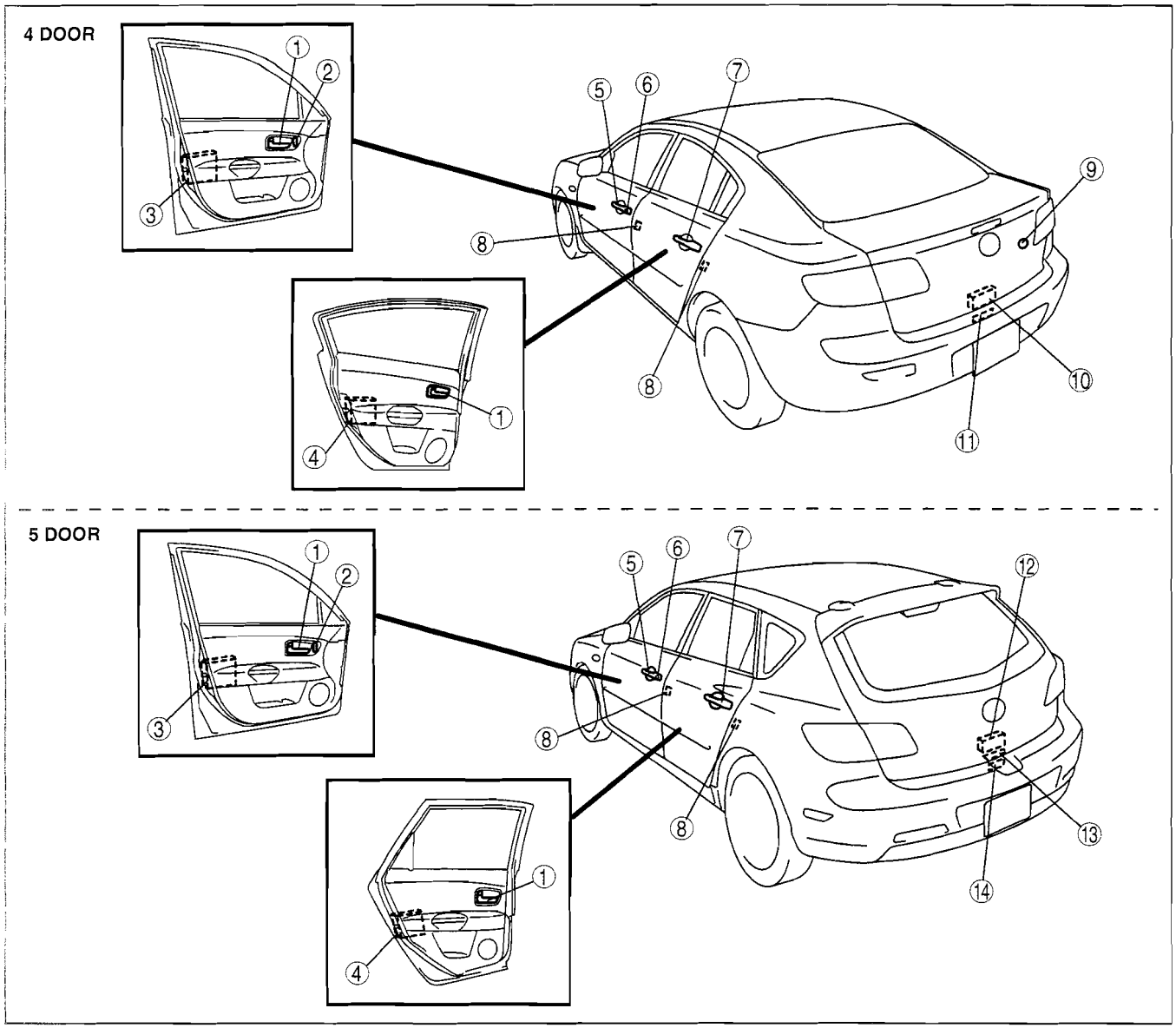
B3E0913W112

09-13

09-14 SECURITY AND LOCKS

SECURITY AND LOCKS LOCATION INDEX

id091400800100



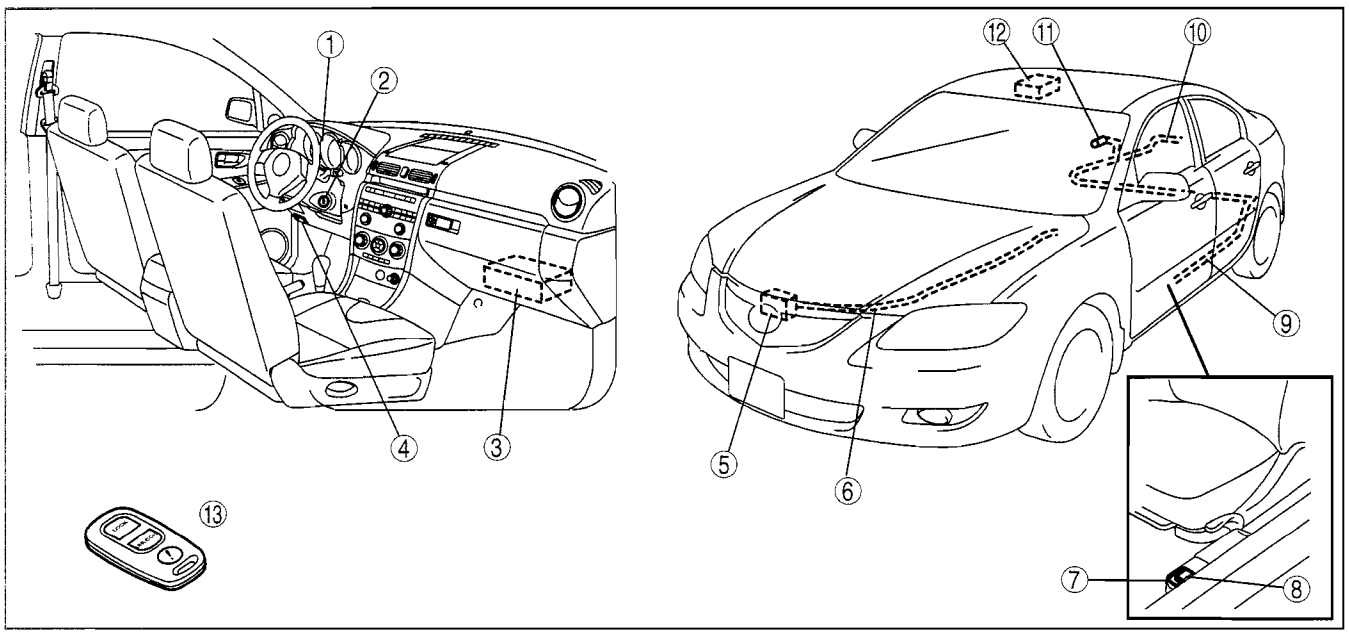
C3U0914W019

1	Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
2	Door lock switch (See 09-14-9 DOOR LOCK SWITCH REMOVAL/INSTALLATION.) (See 09-14-9 DOOR LOCK SWITCH INSPECTION.)
3	Front door latch and lock actuator (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) (See 09-14-7 FRONT DOOR LOCK ACTUATOR INSPECTION.) (See 09-14-7 FRONT DOOR LATCH SWITCH INSPECTION.) (See 09-14-8 DOOR LOCK-LINK SWITCH INSPECTION.) (See 09-14-8 FRONT DOOR KEY CYLINDER SWITCH INSPECTION.)

4	Rear door latch and lock actuator (See 09-14-5 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-6 REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION.) (See 09-14-7 REAR DOOR LOCK ACTUATOR INSPECTION.) (See 09-14-8 REAR DOOR LATCH SWITCH INSPECTION.)
5	Front outer handle (See 09-14-10 FRONT OUTER HANDLE REMOVAL/INSTALLATION.)
6	Front door key cylinder (See 09-14-4 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION.)
7	Rear outer handle (See 09-14-11 REAR OUTER HANDLE REMOVAL/INSTALLATION.)
8	Door lock striker (See 09-14-9 DOOR LOCK STRIKER REMOVAL/INSTALLATION.)

9	Trunk lid key cylinder (See 09-14-28 TRUNK LID KEY CYLINDER REMOVAL/INSTALLATION.) (See 09-14-28 TRUNK LID KEY CYLINDER SWITCH INSPECTION.)
10	Trunk lid latch (See 09-14-28 TRUNK LID LATCH REMOVAL/INSTALLATION.) (See 09-14-29 TRUNK LID LATCH SWITCH INSPECTION.)
11	Trunk lid lock striker (See 09-14-29 TRUNK LID LOCK STRIKER REMOVAL/INSTALLATION.)

12	Liftgate latch and lock actuator (See 09-14-13 LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-13 LIFTGATE LOCK ACTUATOR INSPECTION.) (See 09-14-14 LIFTGATE LATCH SWITCH INSPECTION.)
13	Liftgate outer handle (See 09-14-12 LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION.)
14	Liftgate lid lock striker (See 09-14-14 LIFTGATE LOCK STRIKER REMOVAL/INSTALLATION.)



C3U0914W102

1	Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
2	Coil antenna (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
3	PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.) (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.)
4	Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)

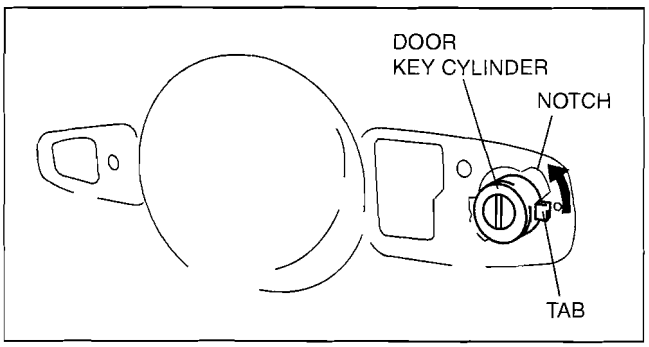
5	Hood latch (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.) (See 09-14-23 HOOD LATCH SWITCH INSPECTION.)
6	Hood cable (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
7	Trunk lid opener lever (See 09-14-30 TRUNK LID OPENER REMOVAL/INSTALLATION.)
8	Fuel-filler lid opener lever (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
9	Fuel-fuller lid opener cable (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
10	Trunk lid opener cable (See 09-14-30 TRUNK LID OPENER REMOVAL/INSTALLATION.)

11	Fuel-fuller lid opener (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
12	Keyless control module (See 09-14-27 KEYLESS CONTROL MODULE REMOVAL/INSTALLATION.) (See 09-14-27 KEYLESS CONTROL MODULE INSPECTION.)
13	Transmitter (See 09-14-24 TRANSMITTER BATTERY REPLACEMENT.) (See 09-14-25 TRANSMITTER BATTERY INSPECTION.) (See 09-14-26 TRANSMITTER ID CODE REGISTRATION.)

FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION

id091400800300

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Fully roll up the front door glass.
3. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front outer handle (See 09-14-10 FRONT OUTER HANDLE REMOVAL/INSTALLATION.)
4. Remove the rod from the front door key cylinder.
5. Turn the key cylinder in the direction indicated by the arrow and move the tab to the notch.
6. Pull the front door key cylinder outward to remove it.
7. Install in the reverse order of removal.

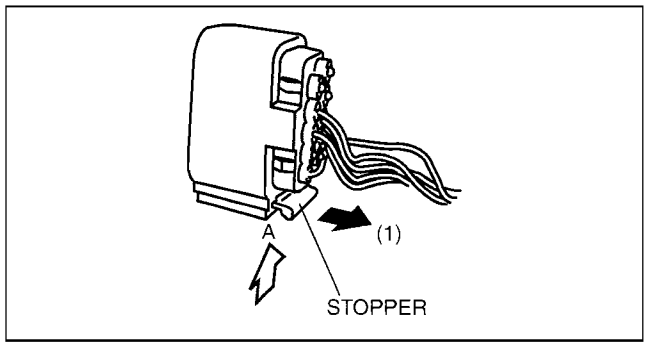


B6U0914WS20

FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

id091400800400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front door glass (See 09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
   (5) Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
   (6) Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
   (7) Front door unit (See 09-11-6 FRONT DOOR UNIT REMOVAL/INSTALLATION.)
3. Pull the stopper of the front door lock actuator connector in the direction of the arrow (1).
4. Disconnect the front door lock actuator connector while pushing at point A.
5. Remove the front door latch and lock actuator from the front door unit.
6. Install in the reverse order of removal.



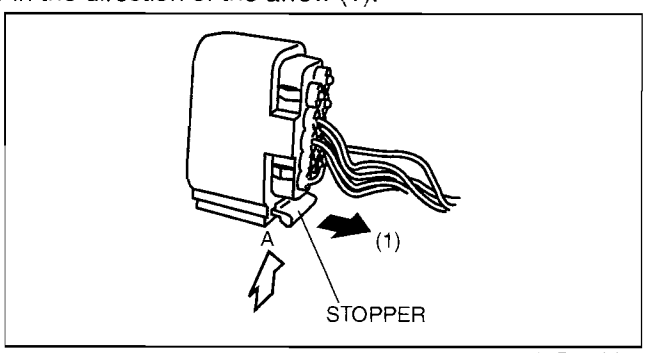
B3E0914W043

REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

id091400800500

09-14

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Sail garnish (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
   (2) Rear door garnish (5 door) (See 09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
   (3) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (4) Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (5) Rear door glass (See 09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
   (6) Rear door speaker (See 09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)
   (7) Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
   (8) Rear door unit (See 09-11-7 REAR DOOR UNIT REMOVAL/INSTALLATION.)
3. Pull the stopper of the rear door lock actuator connector in the direction of the arrow (1).
4. Disconnect the rear door lock actuator connector while pushing at point A.
5. Remove the rear door latch and lock actuator from the rear door unit.
6. Install in the reverse order of removal.

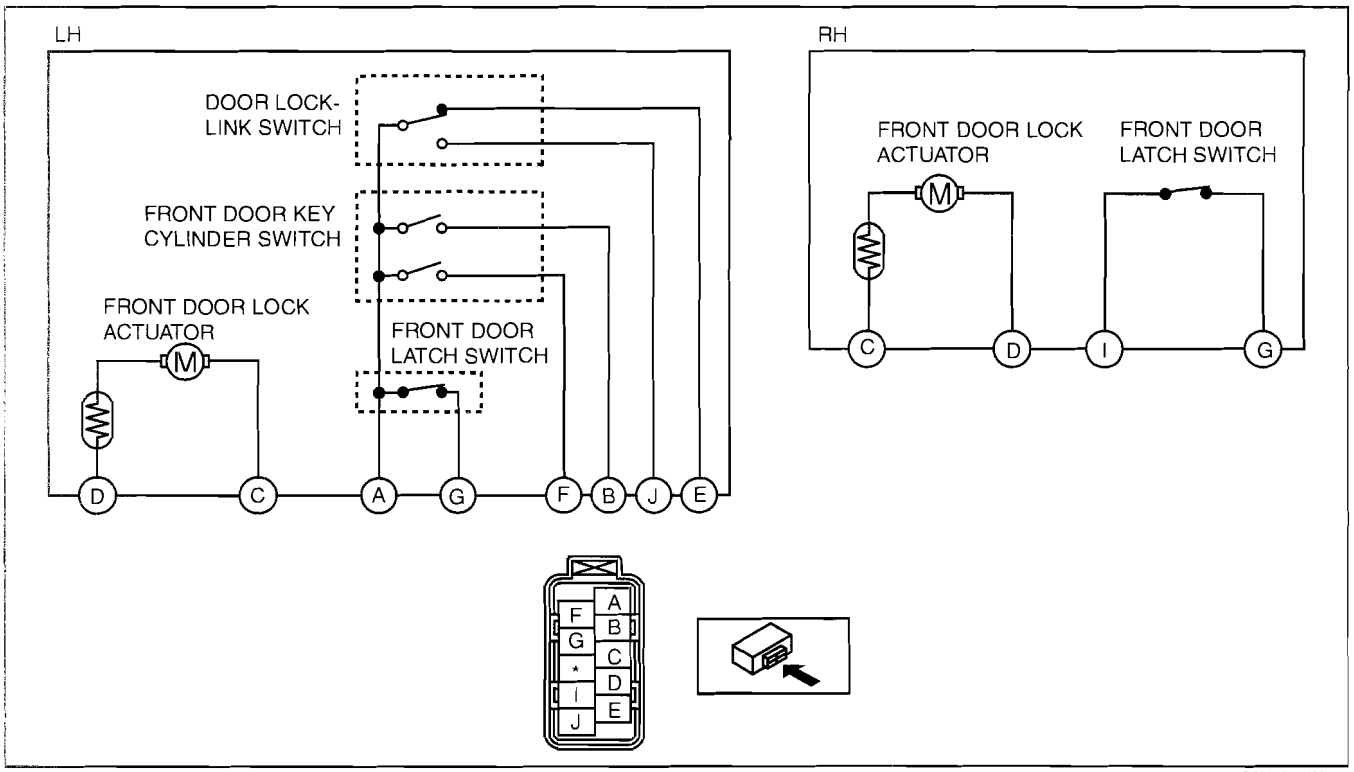


B3E0914W043

FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION

id091400800600

1. The following actuators and switches are integrated with the front door latch and lock actuator. Inspect the front door latch and lock actuator according to each inspection procedure for the following items.
   - Front door lock actuator (See 09-14-7 FRONT DOOR LOCK ACTUATOR INSPECTION.)
   - Front door latch switch (See 09-14-7 FRONT DOOR LATCH SWITCH INSPECTION.)
   - Front door key cylinder switch (Driver's side) (See 09-14-8 FRONT DOOR KEY CYLINDER SWITCH INSPECTION.)
   - Door lock-link switch (Driver's side) (See 09-14-8 DOOR LOCK-LINK SWITCH INSPECTION.)

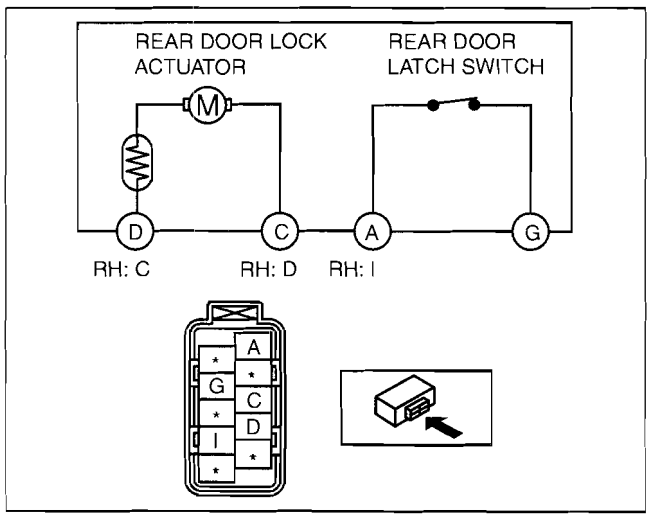


C3U0914W103

REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION

id091400800700

1. The following actuator and switch are integrated with the rear door latch and lock actuator. Inspect the rear door latch and lock actuator according to each inspection procedure for the following items.
   - Rear door lock actuator (See 09-14-7 REAR DOOR LOCK ACTUATOR INSPECTION.)
   - Rear door latch switch (See 09-14-8 REAR DOOR LATCH SWITCH INSPECTION.)



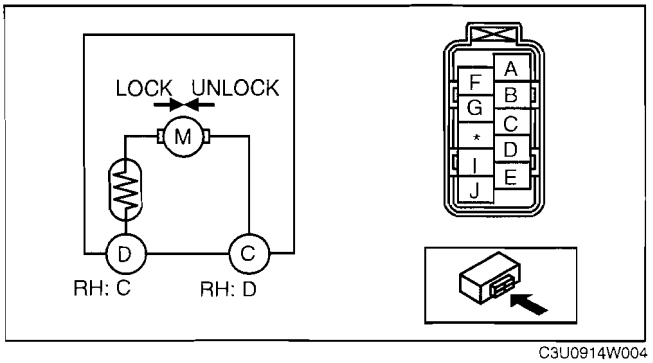
C3U0914W003

FRONT DOOR LOCK ACTUATOR INSPECTION

1. Apply battery positive voltage and connect ground to the corresponding front door lock actuator terminals, and inspect the front door lock actuator operation.
   - If not as specified, replace the front door latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	LH: D RH: C	LH: C RH: D
Unlock	LH: C RH: D	LH: D RH: C

id091400800800



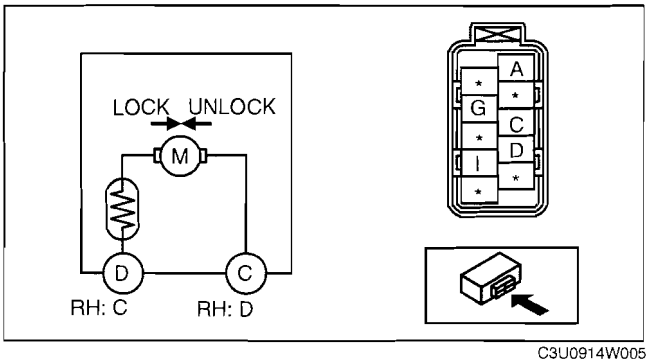
C3U0914W004

REAR DOOR LOCK ACTUATOR INSPECTION

1. Apply battery positive voltage and connect ground to the corresponding rear door lock actuator terminals, and inspect the rear door lock actuator operation.
   - If not as specified, replace the rear door latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	LH: D RH: C	LH: C RH: D
Unlock	LH: C RH: D	LH: D RH: C

id091400800900



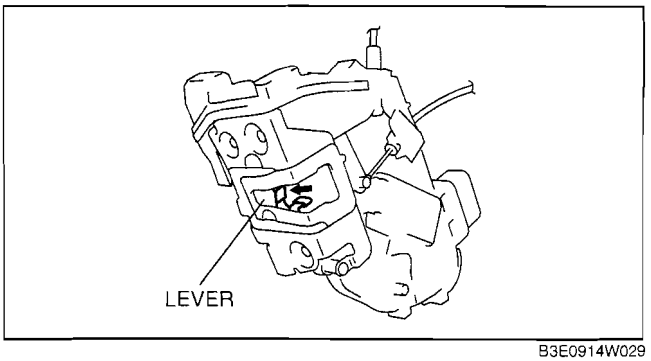
C3U0914W005

09-14

FRONT DOOR LATCH SWITCH INSPECTION

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.

id091400801000



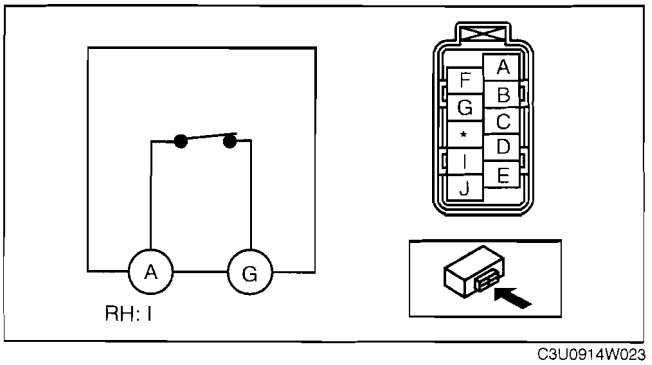
B3E0914W029

2. Inspect for continuity between the front door latch switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	LH: A RH: I	G
Latch (door is closed)	O	O
Unlatch (door is open)		

B3E0914W012

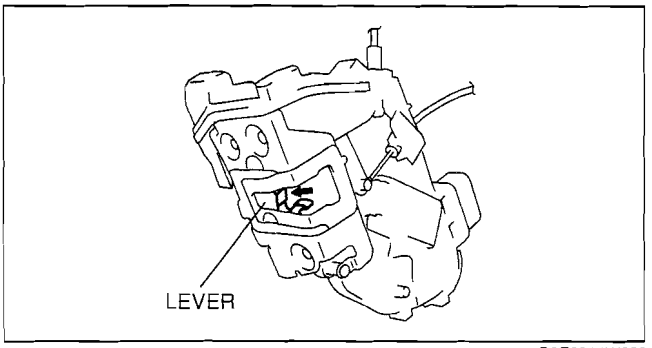


C3U0914W023

REAR DOOR LATCH SWITCH INSPECTION

id091400801100

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



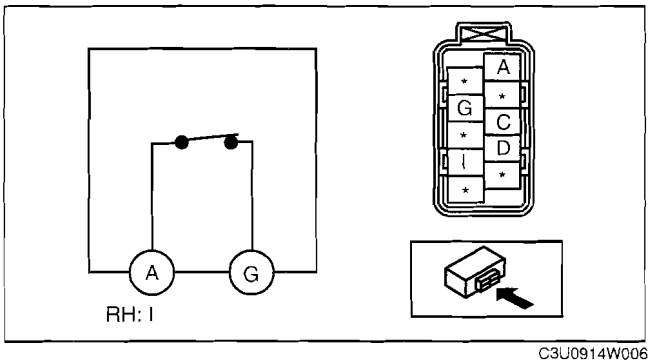
B3E0914W029

2. Inspect for continuity between the rear door latch switch terminals.
   - If not as specified, replace the rear door latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	LH: A RH: I	G
Latch (door is closed)	O	O
Unlatch (door is open)		

B3E0914W012



C3U0914W006

DOOR LOCK-LINK SWITCH INSPECTION

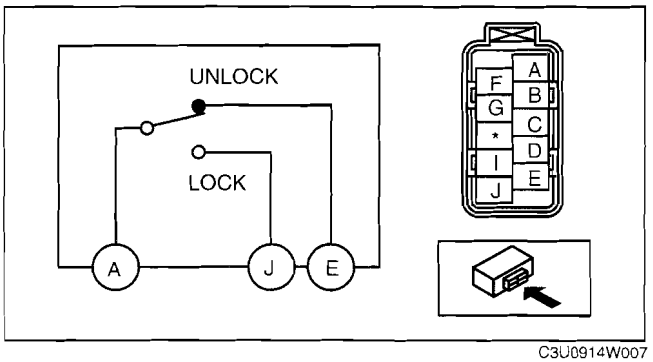
id091400801200

1. Inspect for continuity between the door lock-link switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Lock knob position	Terminal		
	E	LH: A RH: I	J
Lock		O	O
Unlock	O	O	

B3E0914W014



C3U0914W007

FRONT DOOR KEY CYLINDER SWITCH INSPECTION

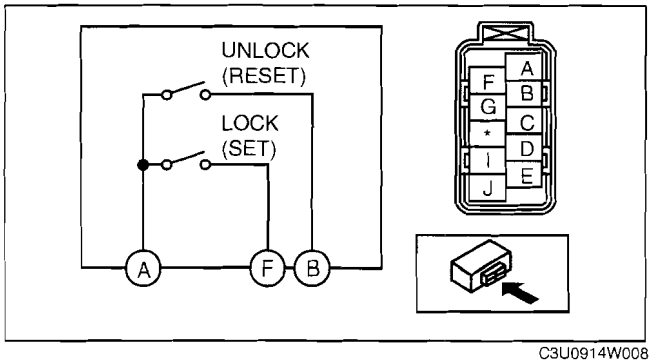
id091400801300

1. Inspect for continuity between the front door key cylinder switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Key cylinder position	Terminal		
	B	LH: A RH: I	F
Lock (Set)		O	O
Unlock (Reset)	O	O	
Neutral			

B3E0914W016

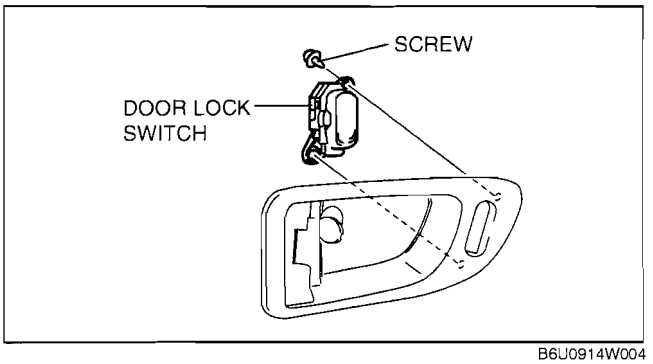


C3U0914W008

DOOR LOCK SWITCH REMOVAL/INSTALLATION

id091400801400

1. Disconnect the negative battery cable.
2. Remove the inner handle cover. (See09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
3. Remove the screws, then remove the door lock switch.
4. Install in the reverse order of removal.



B6U0914W004

DOOR LOCK SWITCH INSPECTION

id091400801500

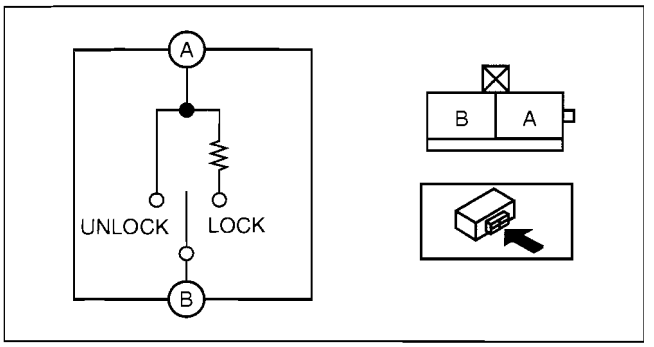
1. Inspect for continuity between the door lock switch terminals using an ohmmeter.
   - If not as specified, replace the door lock switch.

O—O: Continuity O-WW-O: Resistance

Position	Terminal	
	A	B
Lock	O—WW—	—O R
Unlock	O—	—O

R: 940—1,060 ohms

C3U0914W009

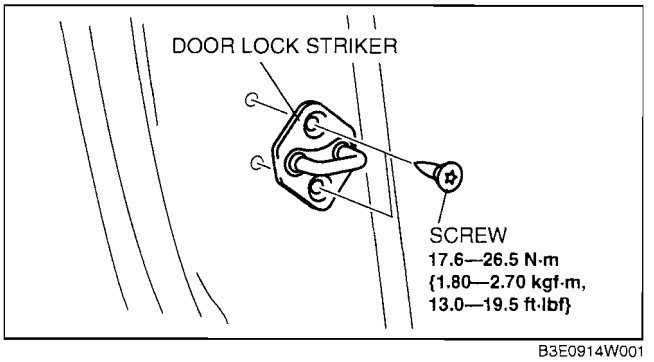


C3U0914W110

DOOR LOCK STRIKER REMOVAL/INSTALLATION

id091400801600

1. Remove the screws, then remove the door lock striker.
2. Install in the reverse order of removal.
3. Adjust the door. (See 09-11-5 DOOR ADJUSTMENT.)

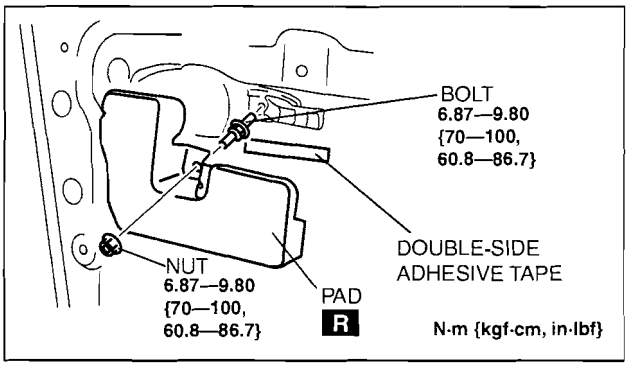


B3E0914W001

FRONT OUTER HANDLE REMOVAL/INSTALLATION

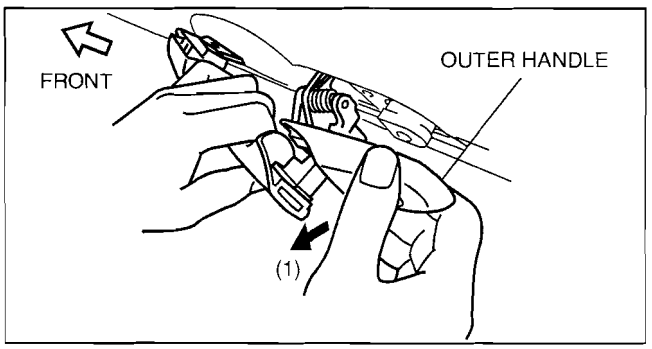
id091400803100

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Fully roll up the front door glass.
3. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
5. Remove the front door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
6. Remove the hole cover.
7. Remove the nut, then remove the pad.
8. Remove the bolt.
9. Detach the rod from the outer handle.



B3E0914W040

10. Secure the rear part of the front outer handle and, with the front outer handle lever pulled outward (1), remove the rear part of the front outer handle from the front door.
11. Pull out the front side of the front outer handle from the front door.
12. Install in the reverse order of removal.

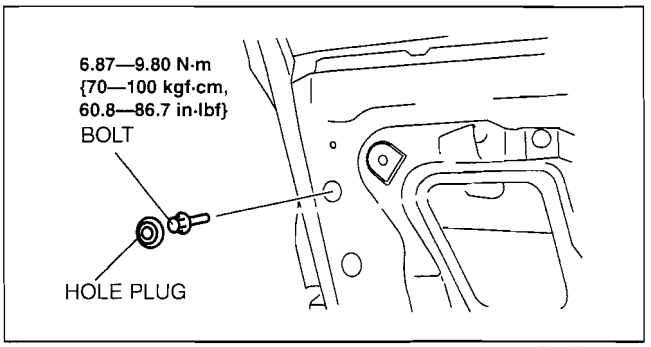


A6E7714W005

REAR OUTER HANDLE REMOVAL/INSTALLATION

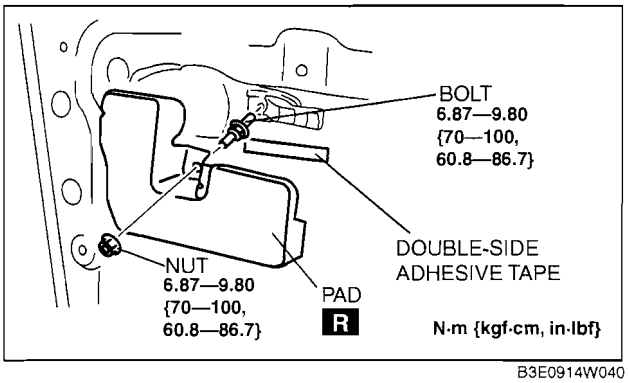
id091400803200

1. Disconnect the negative battery cable. (Vehicles with power window system)
2. Fully roll up the rear door glass.
3. Remove the sail garnish. (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
5. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
6. Remove the hole cover.
7. Remove the hole plug.
8. Remove the bolt.
9. Remove the nut, then remove the pad.



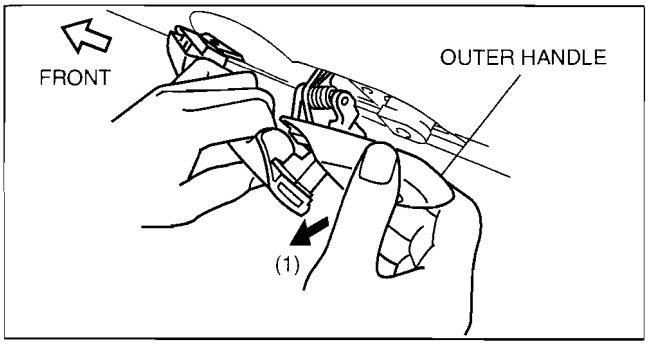
C3U0914W001

10. Remove the bolt.
11. Detach the rod from the outer handle.



B3E0914W040

12. Secure the rear part of the rear outer handle and, with the rear outer handle lever pulled outward (1), remove the rear part of the rear outer handle from the rear door.
13. Install in the reverse order of removal.

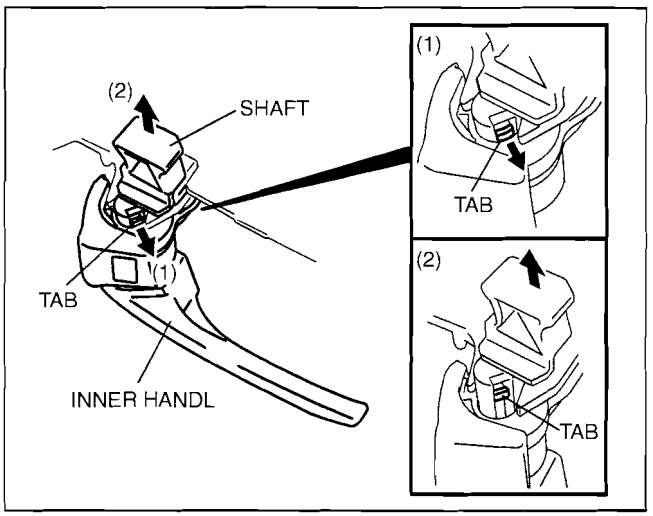


A6E7714W005

INNER HANDLE REMOVAL/INSTALLATION

id091400803300

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Remove the inner garnish. (front) (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
3. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
4. Remove the front door trim or rear door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.) (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
5. Using a flathead screwdriver, press and hold the tab in the direction indicated by arrow (1), and remove the shaft by pulling it in the direction indicated by arrow (2).
6. Pull off the inner handle, and remove the door lock knob cable and inner handle cable.
7. Install in the reverse order of removal.

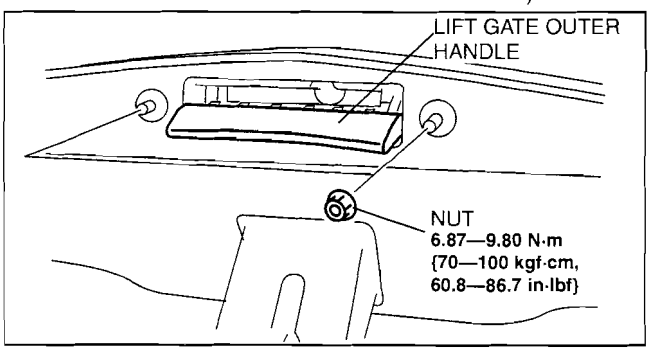


C3U0914W027

LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION

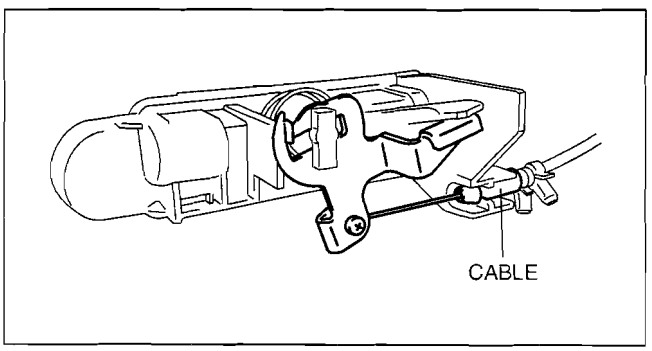
id091400803700

1. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
2. Remove the liftgate side trim. (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove the liftgate lower trim. (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
4. Remove the nuts.



B3E0914W032

5. Detach the cable.
6. Install in the reverse order of removal.

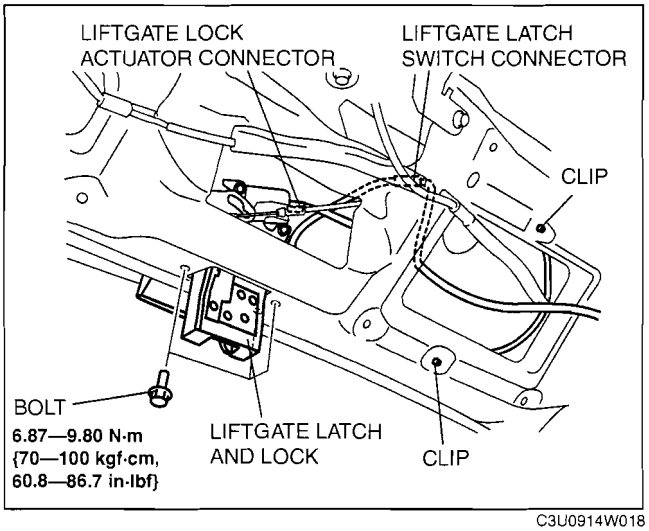


B3E0914W033

LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

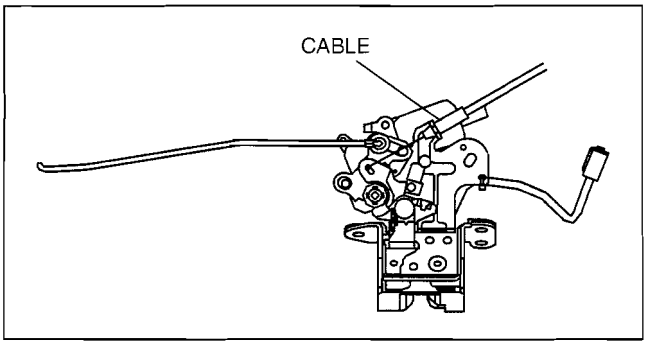
id091400803800

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove the liftgate side trim. (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
4. Remove the liftgate lower trim. (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
5. Disconnect the liftgate lock actuator connector and liftgate latch switch connector.
6. Detach the rod from the liftgate key cylinder.
7. Remove the clips.
8. Remove the bolts.
9. Remove the liftgate latch and lock actuator



C3U0914W018

10. Detach the cable from the liftgate latch and lock actuator.
11. Install in the reverse order of removal.



B3E0914W035

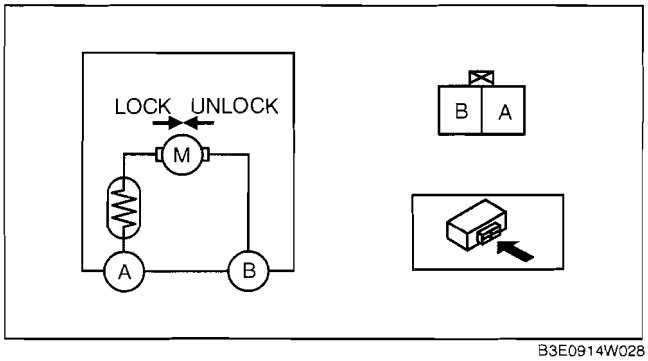
09-14

LIFTGATE LOCK ACTUATOR INSPECTION

id091400803900

1. Apply battery positive voltage and connect ground to the corresponding liftgate lock actuator terminals, and inspect the liftgate lock actuator operation.
   - If not as specified, replace the liftgate latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	A	B
Unlock	B	A

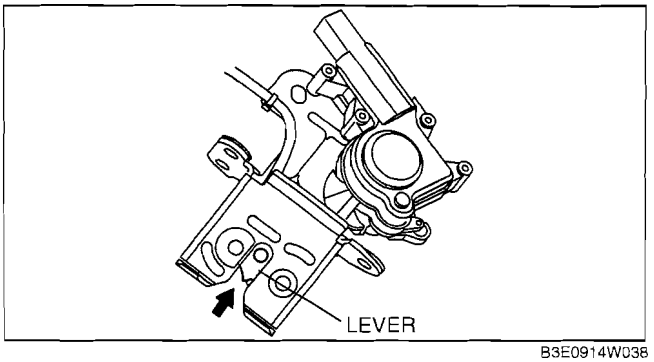


B3E0914W028

LIFTGATE LATCH SWITCH INSPECTION

id091400804000

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



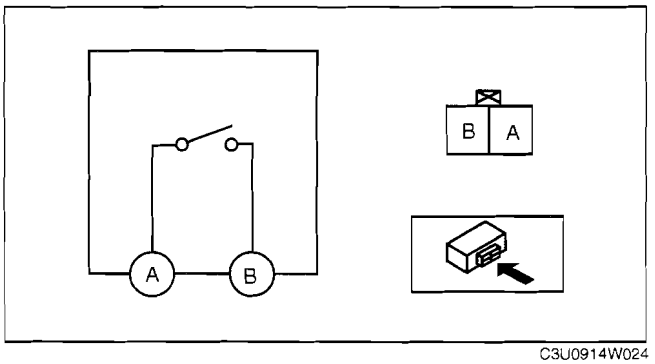
B3E0914W038

2. Inspect for continuity between the liftgate latch switch terminals.
   - If not as specified, replace the liftgate latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (liftgate is closed)		
Unlatch (liftgate is open)	O	O

B3E0914W021

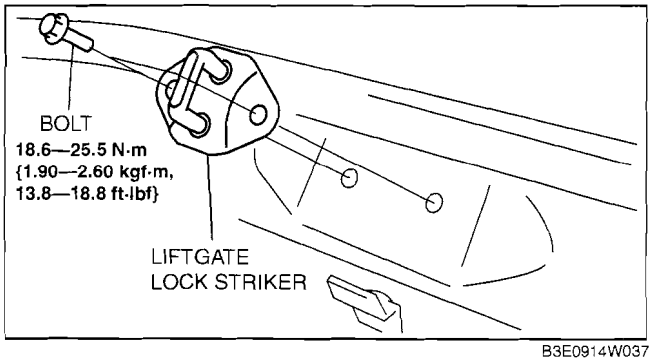


C3U0914W024

LIFTGATE LOCK STRIKER REMOVAL/INSTALLATION

id091400804100

1. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
2. Remove the bolts, then remove the liftgate lock striker.
3. Install in the reverse order of removal.
4. Adjust the liftgate. (See 09-11-9 LIFTGATE ADJUSTMENT.)

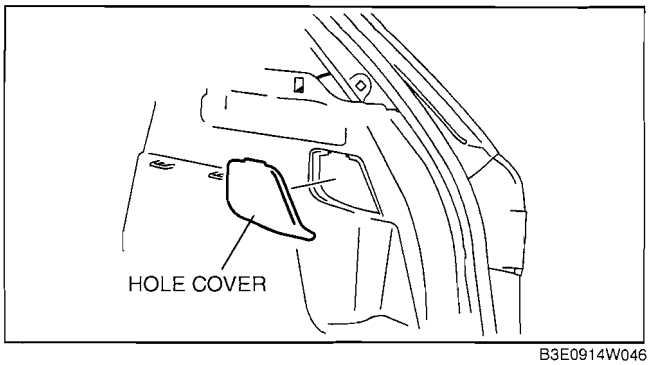


B3E0914W037

FUEL-FILLER LID OPENER REMOVAL/INSTALLATION

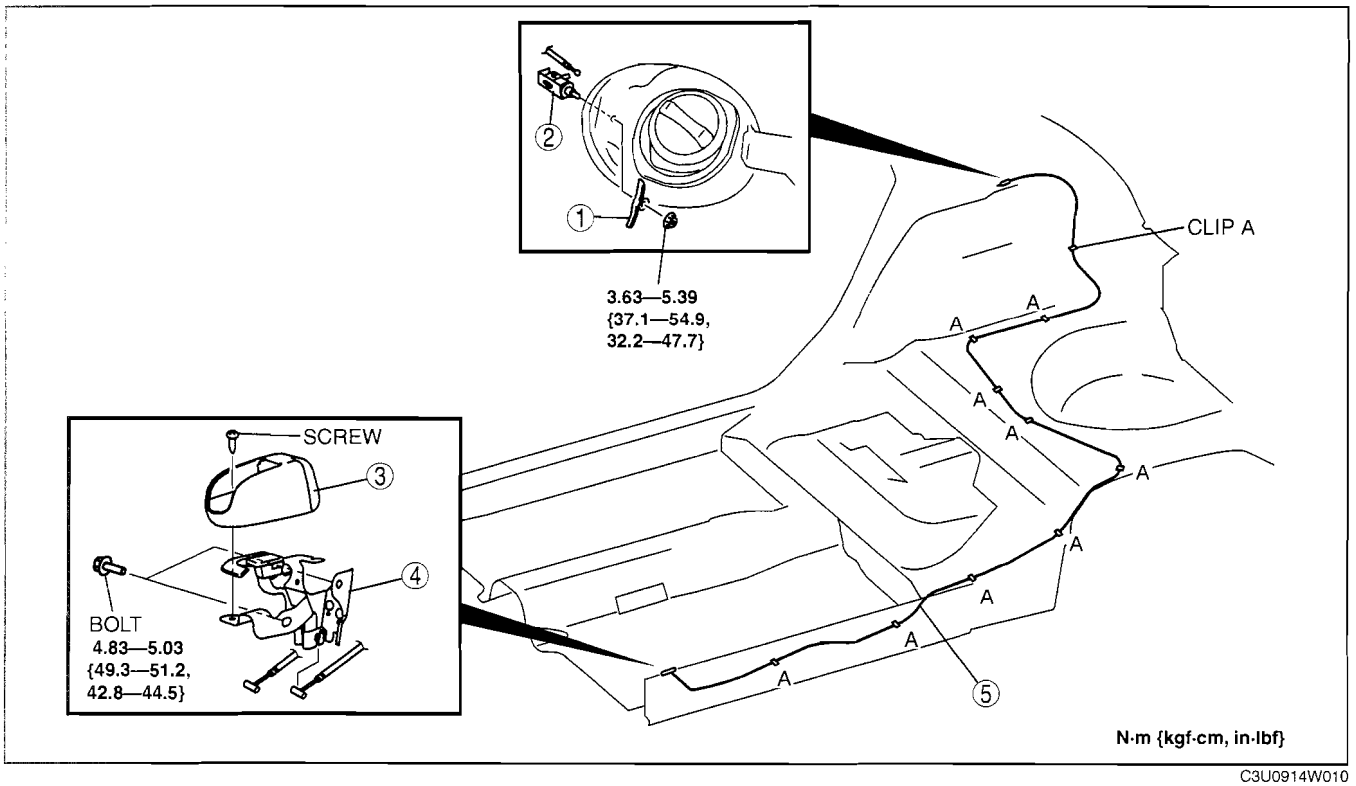
id091400804700

1. To remove the fuel-filler lid opener, remove the following procedure:
   - 5 door
     - — Remove the hole cover on the trunk side trim. (RH)
   - 4 door
     - — Remove the trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
     - — Slightly bend back the trunk side trim. (RH) (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
2. To remove the fuel-filler lid opener lever, remove the following part:.
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)



B3E0914W046

3. When removing the fuel-filler lid opener cable, perform the following procedure:
   (1) Remove the following parts:
      1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
      2) Rear scuff plate (Driver's side) (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
      3) Tire house trim (Driver's side) (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
      4) B-pillar lower trim (Driver's side) (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (2) Partially peel back the floor covering so that the fuel-filler lid opener cable can be removed.
   (3) Remove the fuel-filler lid opener cable from clips A.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



C3U0914W010

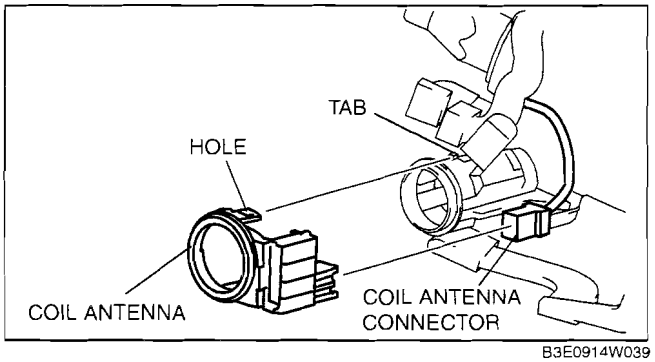
1	Lift spring
2	Fuel-filler lid opener
3	Opener lever cover
4	Fuel-filler lid opener lever and trunk lid opener lever
5	Fuel-filler lid opener cable

COIL ANTENNA REMOVAL/INSTALLATION

id091400804900

Note
- Do not remove the coil antenna unless you are replacing it.

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Hood release lever (See09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (2) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Disconnect the coil antenna connector.
4. Detach the steering lock tabs from the holes on the coil antenna.
5. Install in the reverse order of removal.



B3E0914W039

IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING

id091400805000

Foreword

- When performing the following procedures, the immobilizer resetting procedure using the M-MDS must also always be performed: "instrument cluster replacement", "PCM replacement", "instrument cluster and PCM joint replacement", "Key ID number clearing". The engine will not start unless all work is performed using the M-MDS.
- There are two methods for registering an additional key: Using the M-MDS and using two keys that are able to start the engine.
- When replacing any of the immobilizer system component parts, adding/erasing keys or performing other functions, refer to the following table and perform the applicable procedure (No.1 to 5).

Reference number	Situation	Required items	Cautionary notes
1	Making a spare key when the customer has two or more keys that can start the engine. Or registering an additional key.	• Registration key	• If the additional key registration method has been changed to "Customer spare key programming disabled" (inhibiting the method that uses two keys that are able to start the engine), the M-MDS is required when registering the additional key. In that case, perform procedure No.2.
2	Making a spare key when the customer has one key that can start the engine or no keys. Or registering an additional key.	• Registration key • M-MDS	-
3	Clearing previously registered key ID numbers.	• Registration keys (two or more) • M-MDS	• All the key ID numbers registered in the vehicle will be cleared. • Unless keys are re-registered after clearing the key ID numbers, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
3	Replace all the keys. (Key cylinder replacement)	• Registration keys (two or more) • M-MDS	• When replacing the key cylinder, have two or more keys ready for registration before beginning the procedure, since the previous keys will be invalid.
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is disabled.)	• M-MDS	• After performing this procedure it is not possible to register additional keys according to procedure No.1. The system can be returned to the original setting. The M-MDS must always be used to change the system setting.
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is enabled.)	• M-MDS	• This is the default setting on new vehicles.
5	Replacing the instrument cluster.	• Replacement instrument cluster • Registration keys (two or more) • M-MDS	• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
5	Replacing the PCM.	• Replacement PCM • M-MDS	-

Reference number	Situation	Required items	Cautionary notes
5	Replacing the PCM and instrument cluster.	• Replacement PCM • Replacement instrument cluster • Registration keys (two or more) • M-MDS	• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
	Replacing the coil antenna.	• New coil antenna	• It is not necessary to reset the immobilizer system.

Caution

- **If any of the following items are touching or near the key head, signal communication between the key and vehicle is negatively affected, resulting in the engine not starting or the key registration failure. Do not perform the procedure if any of the following items are touching or near the key head.**
  - **— Any metallic object**
  - **— Spare keys or keys for other vehicles equipped with an immobilizer system**
  - **— Any electronic device, or any credit or other cards with magnetic strips**

EXAMPLES:

METAL RING LYING ON KEY HEAD

METAL PART OF ANOTHER KEY TOUCHING KEY HEAD

KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

am3uuw0000082

Note

- Within the following procedures, the term a "valid key" means a "key that can start the engine".
- After adding/registering keys, clearing ID numbers or replacing any component part of the immobilizer system, verify that all keys can start the engine **within 5 s**.
- When verifying that the keys can start the engine, wait at least **5 s or more** between inserting them.
- If the engine cannot be started using a registered key, repeat the procedure from the beginning.
- Do not start the engine until the key registration procedure for all the necessary keys is completed. If the engine is started during the registration procedure, registration is stopped at that point. Repeat the procedure starting from the beginning if the engine is started before completion.
- Two or more key ID numbers must be registered for the engine to start.
- A maximum of eight key ID numbers can be registered for one vehicle. The M-MDS can be used to verify the number of key ID numbers registered to a single vehicle.
- Do not select screen menus of the M-MDS that are not indicated within the procedures.

No.1 Additional Key Registration Procedure (Using Two Valid Keys)

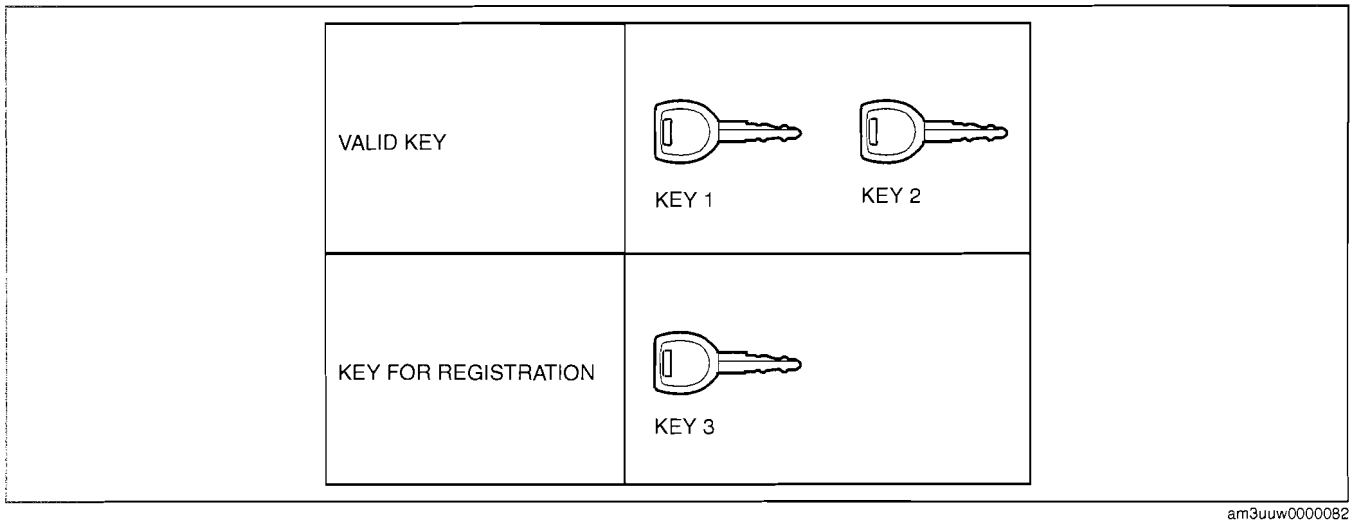
Conditions

- Customer has two or more valid keys.

Note

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "09-14-20 No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)".

Procedure



am3uuw0000082

1. Have one key (key 3) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.
3. Verify that the security light illuminates for **approx. 3 s** and then goes out.
4. Using key 1, turn the ignition switch to the LOCK position **within approx. 4 s** after the security light goes out.
5. Remove key 1
6. Repeat Steps 2—5 using key 2.
7. Repeat Steps 2—5 using key 3.
8. If additional keys need to be registered, repeat Steps 1—7 in the same manner as key 3.

No.2 Additional Key Registration Procedure (Using the M-MDS)

Conditions

- Customer has only one valid key. Or customer has no valid keys. (Can also be performed even if there are two or more valid keys)

Note

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "09-14-20 No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)".

Procedure

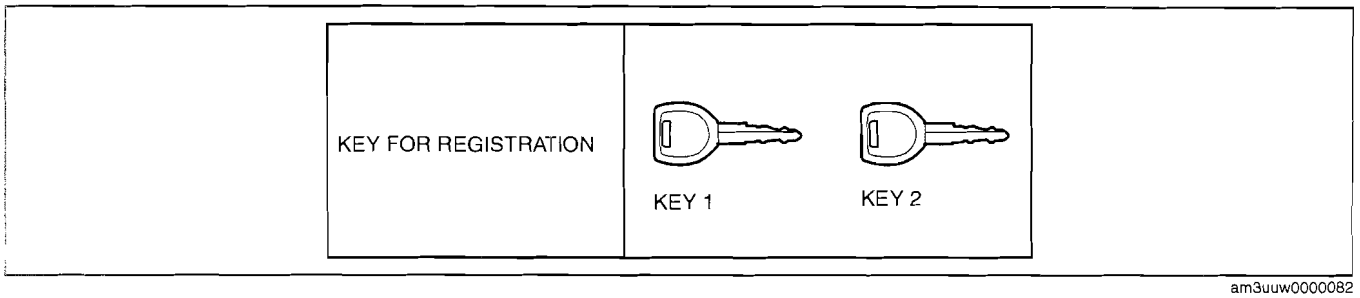
1. Have one key (key 1) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.

Note

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Program Additional Ignition Key" from the M-MDS screen menu.

No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration) Procedure



am3uuw0000082

1. Have two or more keys (key 1, key 2) ready for registration after the clearing the key ID numbers.
2. Using key 1, turn the ignition switch to the ON position.

Note
- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Ignition key ID number Erase" from the M-MDS screen menu and perform the tasks according to the M-MDS screen.

No.4 Changing the Method for Registering Additional Keys

Note
- This procedure is for changing the enable/disable setting of the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)".
- The default setting for new vehicles and new instrument cluster replacement is "Enabled".
- By disabling the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)", only the M-MDS can be used to register additional keys, thereby preventing two valid keys from being used to create an unauthorized spare key. This function is for use by rental car or other companies with vehicle fleets.

Procedure

1. Using any key, turn the ignition switch to the ON position. (Either a valid or an unregistered key can be used.)

Note
- When using an unregistered key, although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

2. Connect the M-MDS to the DLC-2.
3. Select "Body/Security/PATS function" from the M-MDS screen menu.
4. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
5. Select either "Customer Spare Key Programming Enable" or "Customer Spare Key Programming Disable" from the M-MDS screen menu. Depending on the selected menu, the additional key registration method is as shown below:

Setting	Additional key registration method	
	Procedure using two valid keys	Procedure using the M-MDS
Customer spare key programming enable	x	x
Customer spare key programming disable	-	x

x : Procedure is possible
- : Procedure is not possible

6. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit" to complete the M-MDS function.
7. After Step 6, wait **10 s or more** and then turn the ignition switch to the LOCK position.

No.5 Resetting Procedure for the Immobilizer System when Replacing the PCM or Instrument Cluster

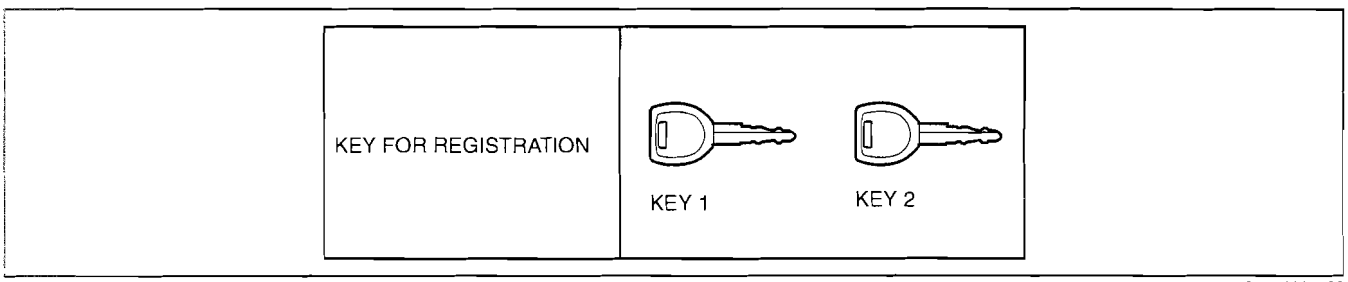
Conditions

- When replacing only the PCM: No conditions.
- When replacing only the instrument cluster: Customer has two or more valid keys after replacement tasks.
- When replacing the PCM and the instrument cluster: Customer has two or more valid keys after replacement.

Caution

- **When replacing the PCM and the instrument cluster at the same time, follow the same instructions described in the procedure for "when replacing the instrument cluster".**
- **When replacing only the PCM, start from Step 2. Also, when key 1 is indicated within the procedure, any valid key can be used.**
- **Before starting Step 1, complete the procedure for PCM and instrument cluster replacement.**

Procedure



am3uuw0000082

1. Have two or more keys (key 1, key 2) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.

Note

- When replacing only the PCM: The security light illuminates **for 3 s** and then goes out.
- When replacing the instrument cluster: Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Parameter Reset" from the M-MDS screen menu.
7. Perform security access again as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
8. Select the replaced part as indicated on the M-MDS screen.
   - When replacing only the PCM: Select "PCM".
   - When replacing only the instrument cluster: Select "HEC".

Note

- At this time, do not select any other parts from the M-MDS screen menu.

9. Perform the tasks according to the M-MDS screen.

No.6 Security Access Procedure

Note

- Security access must be performed when performing the following functions: "Program Additional Ignition Key", "Ignition Key ID Number Erase", "Customer Spare Key Programming Enable/Disable" and "Parameter Reset".

Procedure

1. Connect the M-MDS to the DLC-2.
2. Select "Body/Security/PATS function" from the M-MDS screen menu.
3. Security access is started and the M-MDS displays "Outcode".

Caution

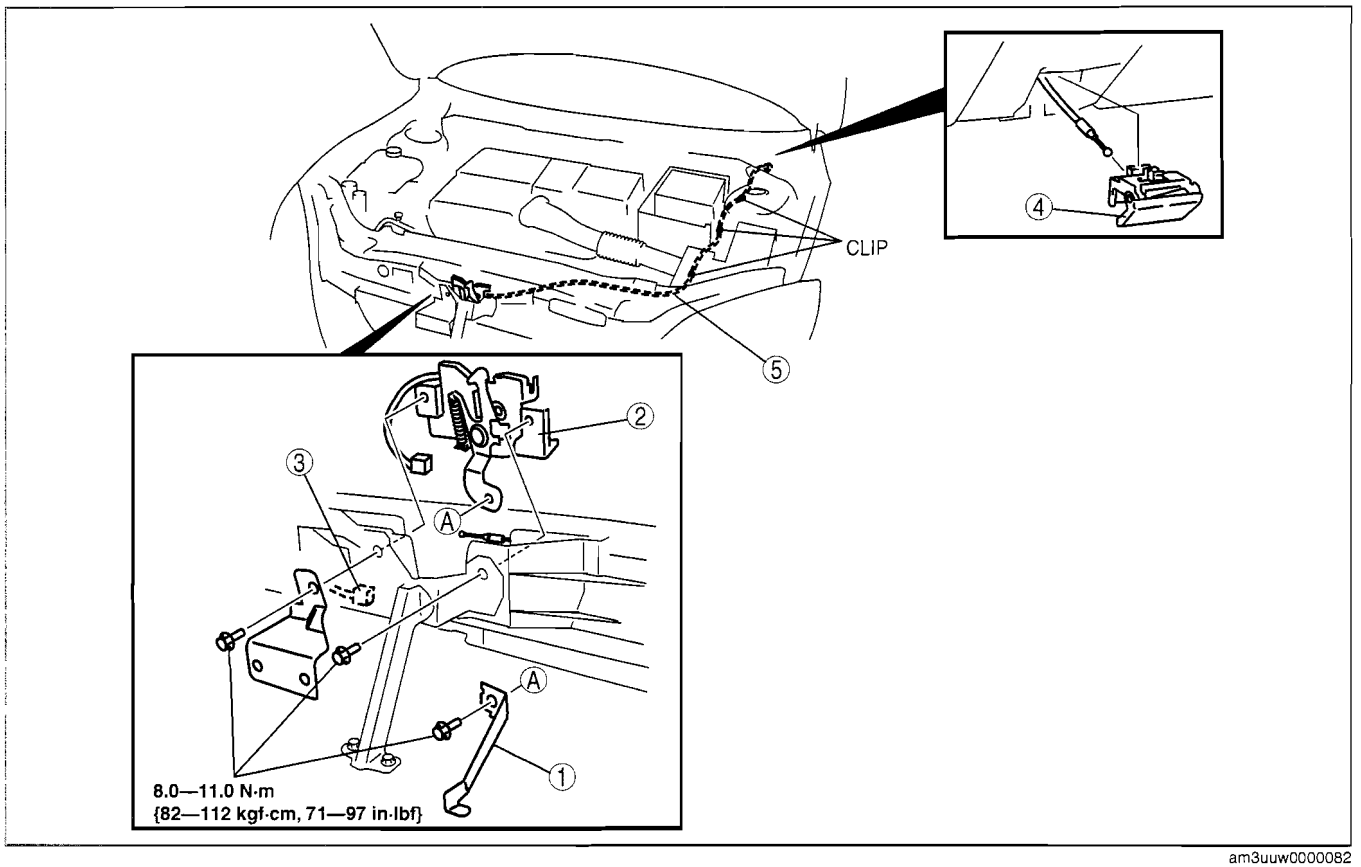
- **After reading out the outcode, do not turn ignition switch from LOCK to ON position 5 times, otherwise the outcode value will be changed.**

4. Input the corresponding "Incode" for the "Outcode" displayed on the M-MDS screen.
5. After successfully performing security access, "Program Additional Ignition Key", "Ignition key ID number Erase" or "Customer Spare Key Programming Enable/Disable" is displayed on the M-MDS screen. When performing "Parameter Reset", security access is requested two times and after successfully performing it the second time, "Replacement Module" is displayed.

HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION

id091400805300

1. To remove the hood release cable, remove the following parts:
   (1) Battery (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Fresh-air duct (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the hood. (See 09-10-4 HOOD ADJUSTMENT.)



am3uuw0000082

1	Lever (5 door)
2	Hood latch
3	Hood latch switch connector

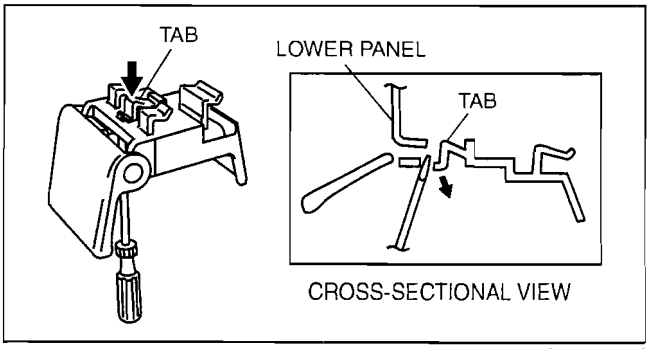
4	Hood release lever (See 09-14-22 Hood Release Lever Removal Note.)
5	Hood release cable

Hood Release Lever Removal Note

1. Pull the lever.
2. While pushing the tab in the direction of the arrow using a tape-wrapped, small flathead screwdriver, detach it from the lower panel.

   Caution
   - **Be careful not to damage the hood release cable when removing the hood release lever with the flathead screwdriver.**

3. Under the condition in Step 2, pull the hood release lever outward, then remove it from the lower panel.

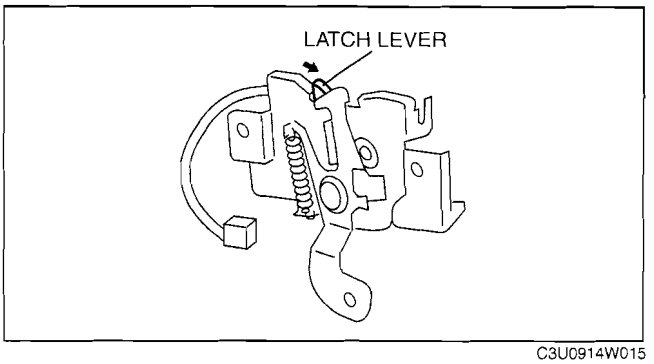


am3uuw0000083

HOOD LATCH SWITCH INSPECTION

id091400805400

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



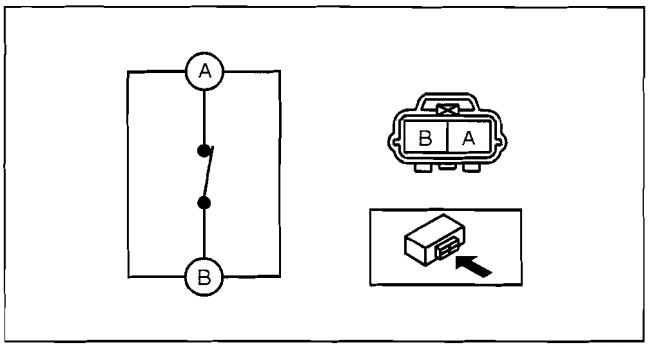
C3U0914W015

2. Inspect for continuity between the hood latch switch terminals.
   - If not as specified, replace the hood latch.

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (hood is closed)		
Unlatch (hood is open)	O	O

C3U0914W123

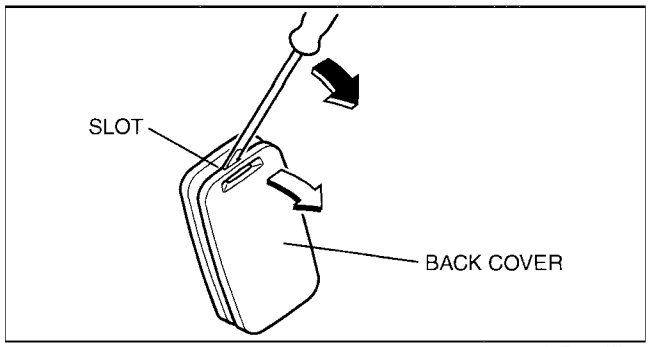


C3U0914W114

TRANSMITTER BATTERY REPLACEMENT

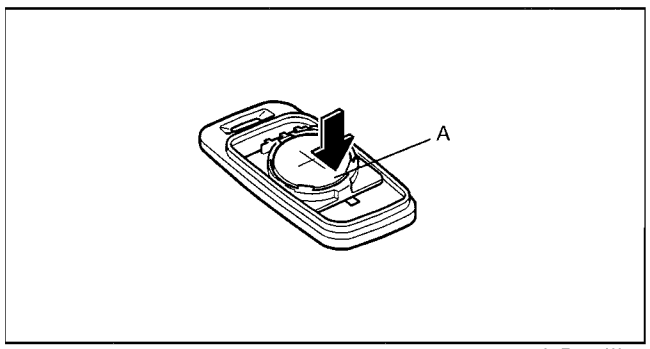
id091400805700

1. Insert a small flathead screwdriver into the slot and gently pry open the transmitter.



A6E7718W001

2. Press the portion of the battery indicated by A and remove the battery.
3. Install a new battery (CR2025) into the front portion of the holder with the positive pole (+) facing up. Press on the B portion of the battery to set the battery.

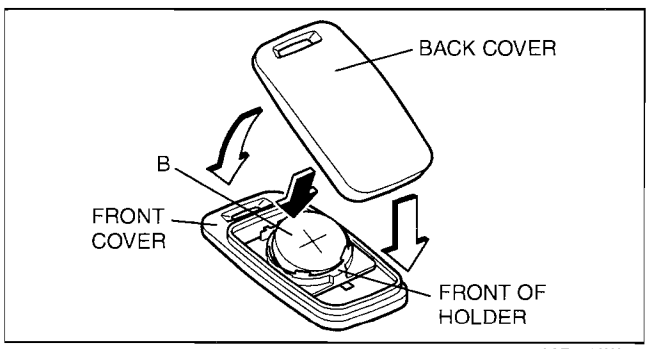


A6E7718W002

4. Align the front and back covers and snap the transmitter shut.

Battery specification
Lithium CR2025 × 1

Note
- The batteries will last about **2 years** when used **10 times** a day.



A6E7718W003

TRANSMITTER BATTERY INSPECTION

id091400805800

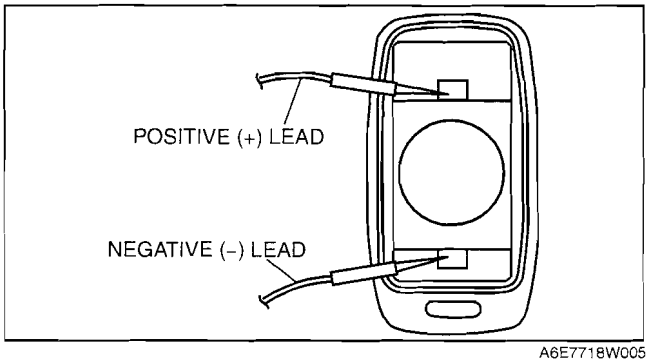
Caution

- **Since the battery voltage does not drop fully if the button is pushed for only 4 s or less, sufficient battery voltage cannot be determined. Always push the button for 5 s.**

Note

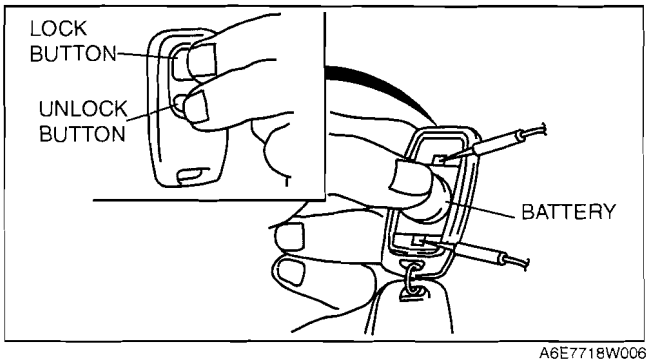
- A correct measurement cannot be obtained if the battery temperature is low. Make sure the battery is at **18 °C {64 °F} or more** for **at least 30 min** before reinspecting if a measurement value is under the standard voltage.

1. Remove the transmitter cover.
2. Apply the ohmmeter leads to the positions as indicated in the figure.



A6E7718W005

3. While pressing the battery as shown in the figure, press the LOCK and UNLOCK buttons on the transmitter at the same time to start measurement of the voltage.
4. Release the buttons after **5 s**.
5. Verify that the minimum voltage is the standard voltage or more for **10 s** after starting measurement.
   - If the voltage is under the standard voltage, replace the battery.



A6E7718W006

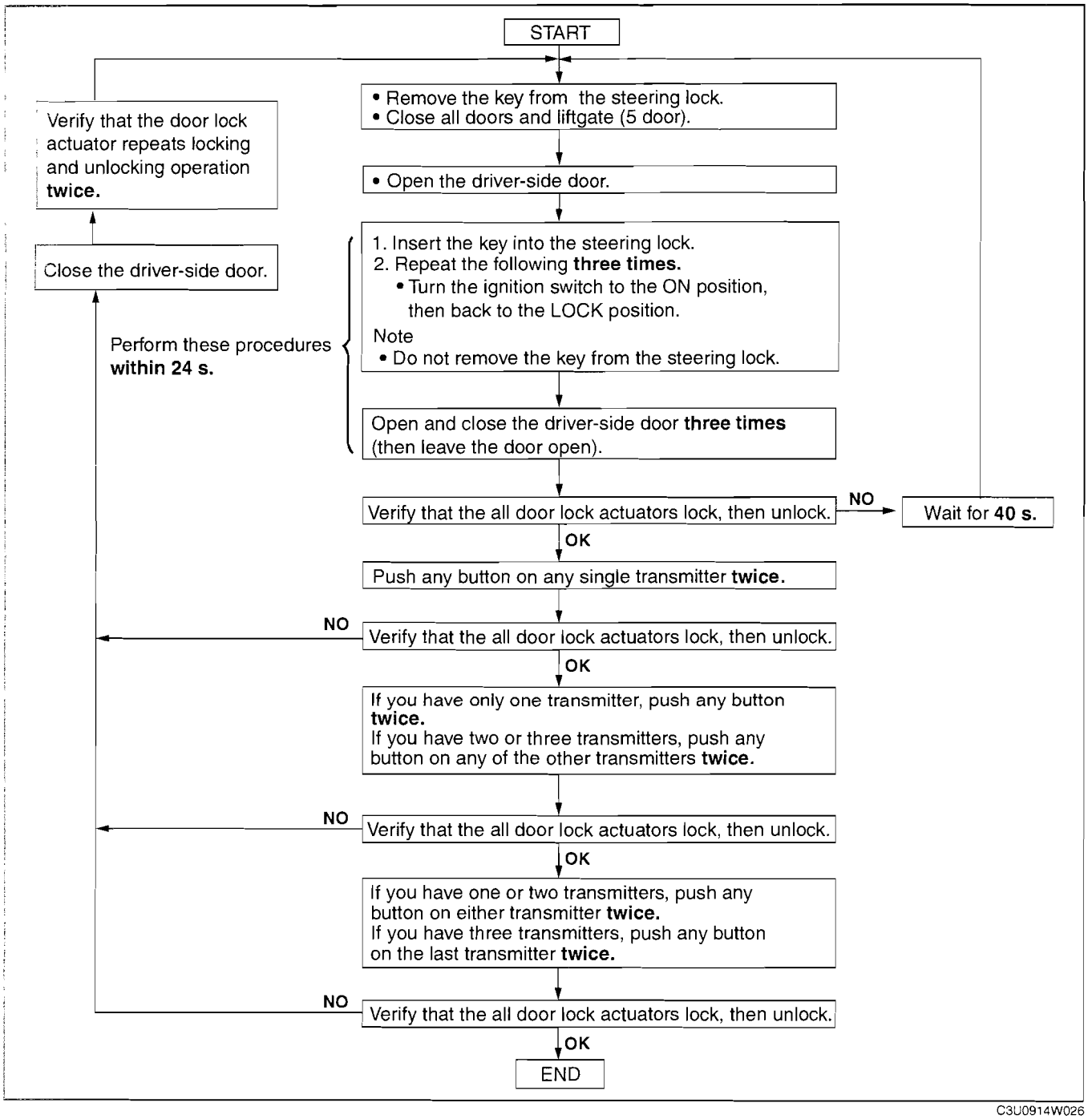
Standard voltage
2.7 V

TRANSMITTER ID CODE REGISTRATION

id091400805900

Note

- When registering the ID code into a keyless control module, verify that other transmitters are not being operated in the vicinity.
- After ID code registering, remove the key from the steering lock and verify that all doors lock/unlock normally using the transmitter.

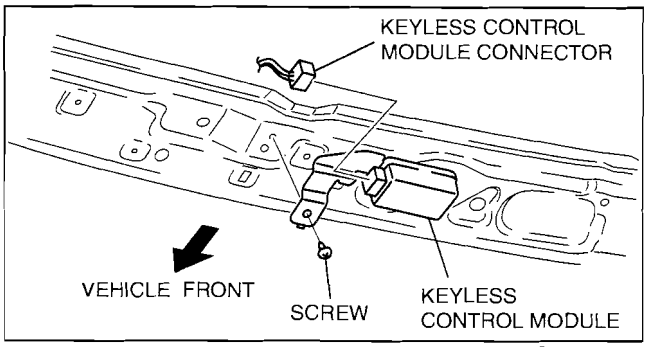


C3U0914W026

KEYLESS CONTROL MODULE REMOVAL/INSTALLATION

id091400806300

1. Disconnect the negative battery cable.
2. Remove the map light. (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
3. Disconnect the keyless control module connector.
4. Remove the screw, then remove the keyless control module.
5. Install in the reverse order of removal.
6. When replacing the keyless control module, register the transmitter ID codes. (See 09-14-26 TRANSMITTER ID CODE REGISTRATION.)



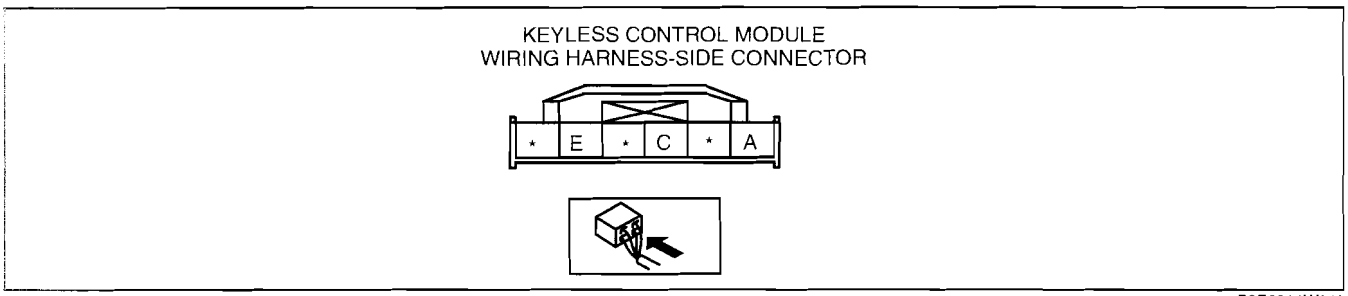
C3U0914W013

KEYLESS CONTROL MODULE INSPECTION

id091400806400

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).
   - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.
2. If the system does not work properly even though the inspection items or related wiring harnesses do not have any malfunction, perform symptom troubleshooting [KEYLESS ENTRY SYSTEM].

Terminal Voltage Table (Reference)



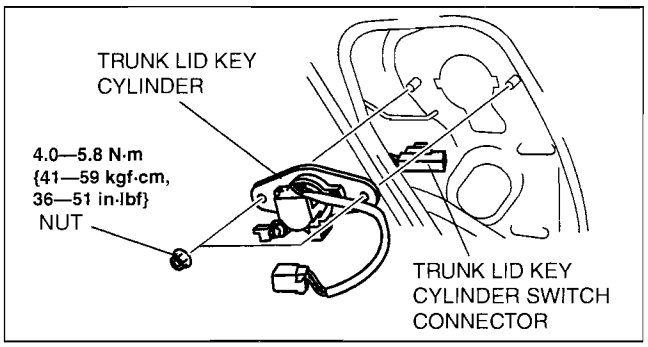
B3E0914W049

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/ Continuity	Inspection item(s)
A	Power supply	PJB	Under any condition	B+	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • Related wiring harnesses
C	Data	PJB	Under any condition: Inspect the wiring harness between the keyless control module and PJB terminal J-04 F for continuity.	Continuity detected	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • transmitter (See 09-14-25 TRANSMITTER BATTERY INSPECTION.) • Related wiring harnesses
E	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND

TRUNK LID KEY CYLINDER REMOVAL/INSTALLATION

id091400810900

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Detach the rod from the trunk lid key cylinder.
4. Disconnect the trunk lid key cylinder connector.
5. Remove the nuts, then remove the trunk lid key cylinder.
6. Install in the reverse order of removal.



B3E0914W007

TRUNK LID KEY CYLINDER SWITCH INSPECTION

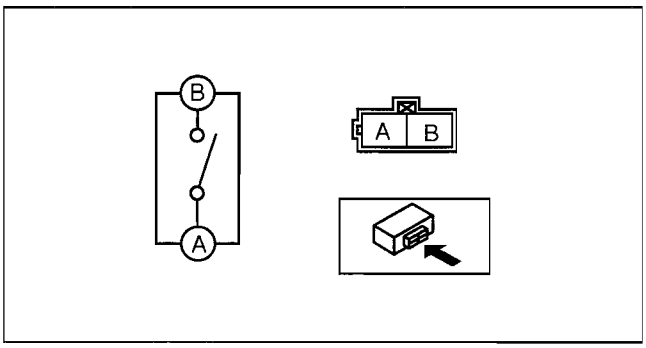
id091400811000

1. Inspect for continuity between the trunk lid key cylinder push switch terminals.
   - If not as specified, replace the trunk lid key cylinder.

O—O : Continuity

Operation	Terminal	
	A	B
On (Unlock)	O	O
Off		

c3u0914w017

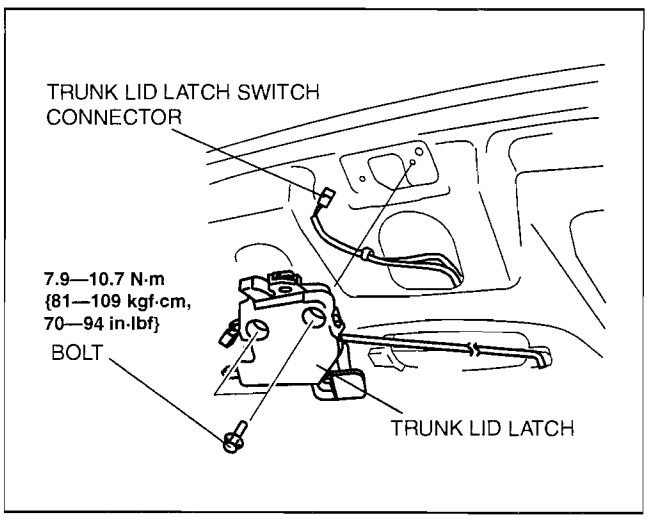


c3u0914w016

TRUNK LID LATCH REMOVAL/INSTALLATION

id091400817100

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Detach the rod from the trunk lid key cylinder.
4. Disconnect the trunk lid latch switch connector.
5. Remove the bolts, then remove the trunk lid latch and opener.
6. Install in the reverse order of removal.
7. Adjust the trunk lid. (See 09-10-7 TRUNK LID ADJUSTMENT.)

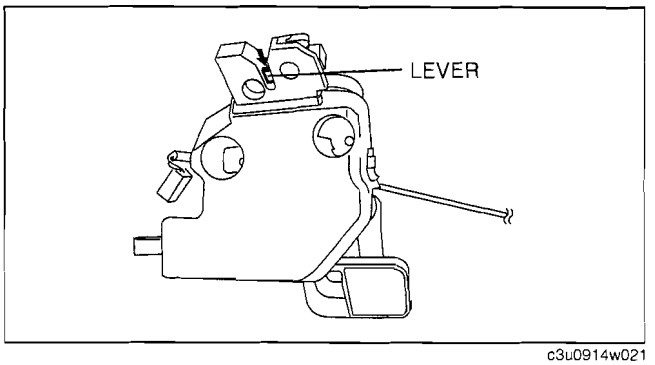


c3u0914w020

TRUNK LID LATCH SWITCH INSPECTION

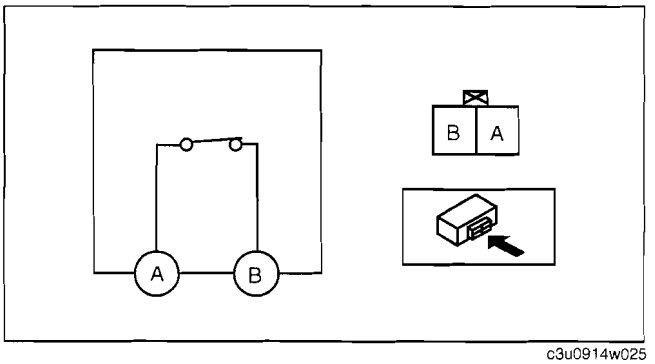
id091400811200

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



c3u0914w021

2. Inspect for continuity between the trunk lid latch switch terminals.
   - If not as specified, replace the trunk lid latch and lock actuator.



c3u0914w025

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (trunk lid is closed)		
Unlatch (trunk lid is open)	O	O

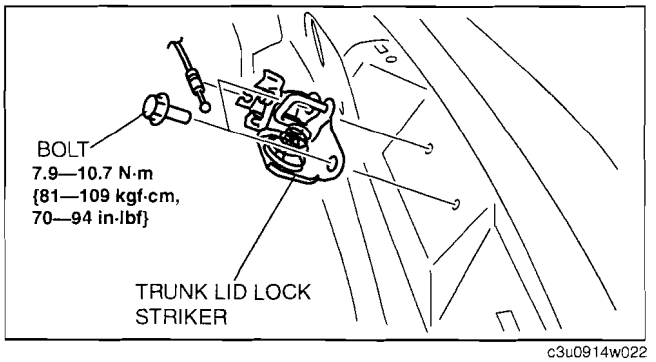
B3E0914W019

09-14

TRUNK LID LOCK STRIKER REMOVAL/INSTALLATION

id091400811300

1. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
2. Detach the trunk lid opener cable.
3. Remove the bolts, then remove the trunk lid striker.
4. Install in the reverse order of removal.
5. Adjust the trunk lid. (See 09-10-7 TRUNK LID ADJUSTMENT.)

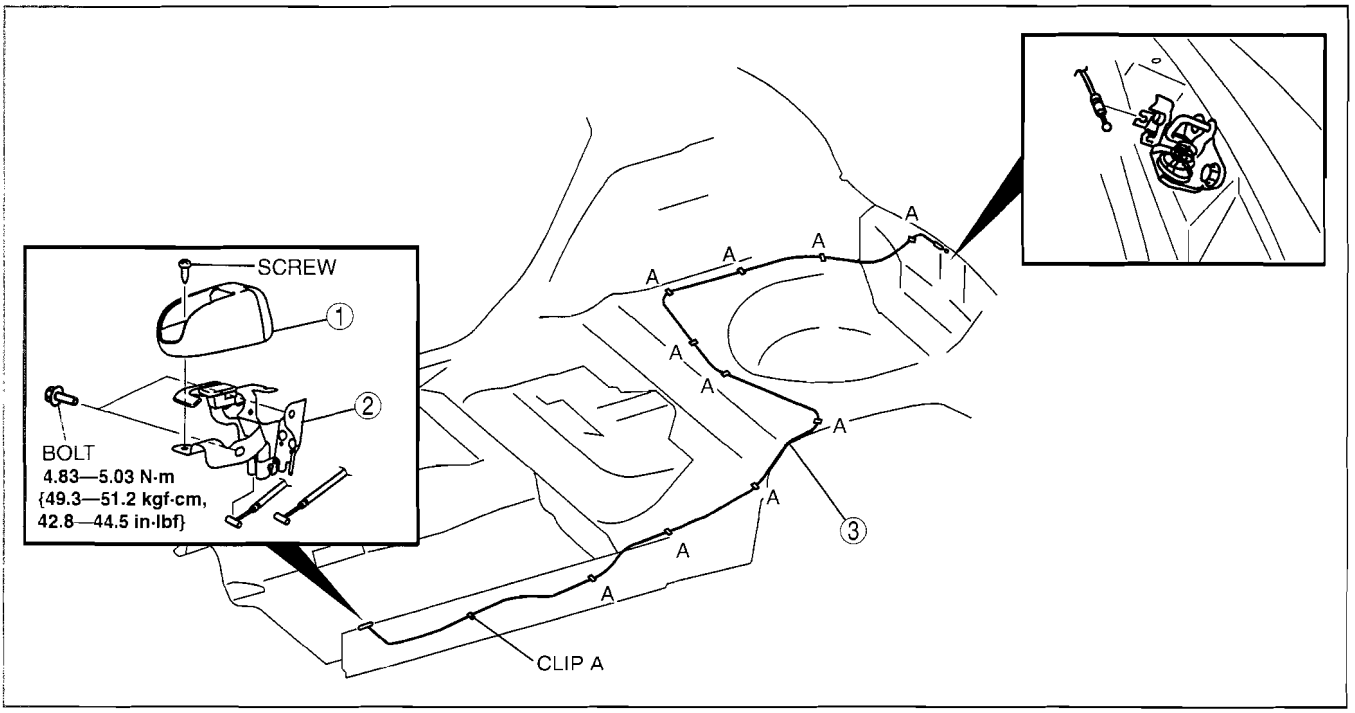


c3u0914w022

TRUNK LID OPENER REMOVAL/INSTALLATION

id091400812100

1. To remove the trunk lid opener lever, remove the following part:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
2. When removing the trunk lid opener cable, perform the following procedure:
   (1) Remove the following parts:
      1) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
      2) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
      3) Rear scuff plate (Driver's side) (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
      4) Tire house trim (Driver's side) (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
      5) B-pillar lower trim (Driver's side) (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (2) Partially peel back the floor covering so that the trunk lid opener cable can be removed.
   (3) Remove the trunk lid opener cable from the trunk lid lock striker.
   (4) Remove the trunk lid opener cable from the clips A.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



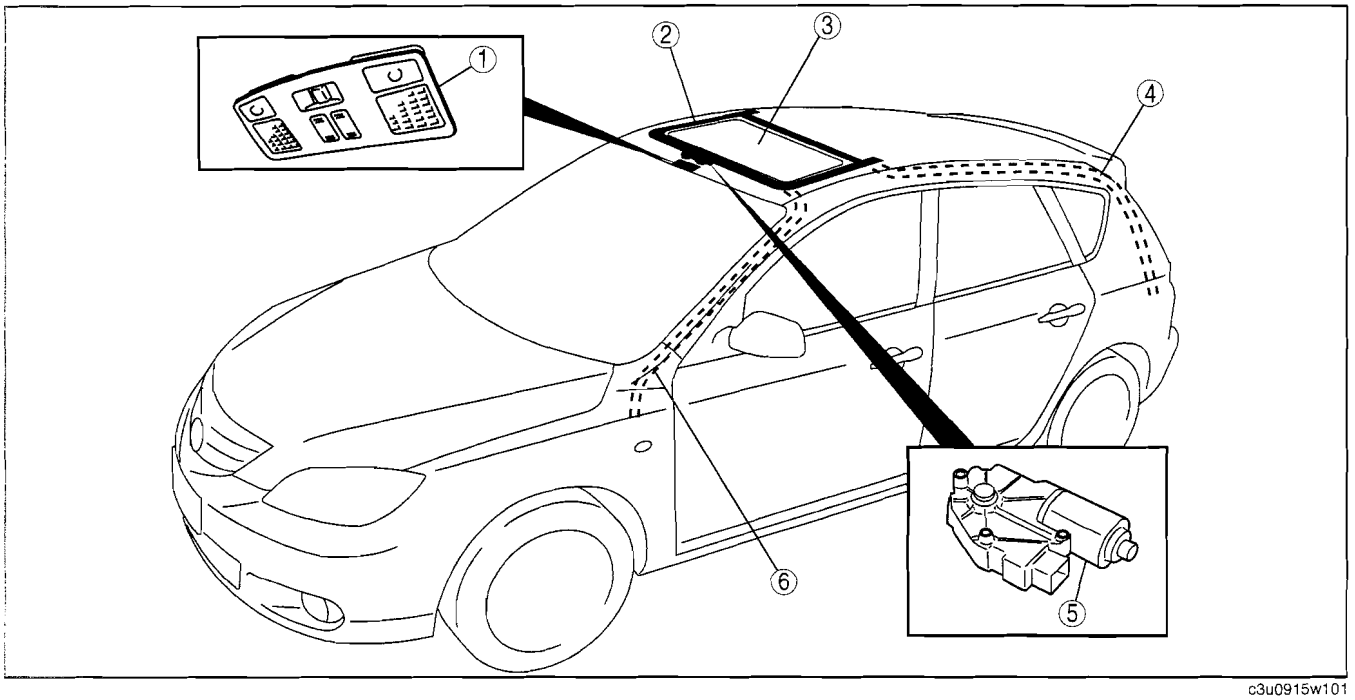
c3u0914w014

1	Opener lever cover
2	Fuel-filler lid opener lever and trunk lid opener lever
3	Trunk lid opener lever cable

09-15 SUNROOF

SUNROOF LOCATION INDEX

id091500800100



c3u0915w101

1	Sunroof switch (See 09-15-2 SUNROOF SWITCH REMOVAL/INSTALLATION.) (See 09-15-2 SUNROOF SWITCH INSPECTION.)
2	Sunroof unit (See 09-15-3 SUNROOF UNIT REMOVAL/INSTALLATION.) (See 09-15-4 SUNROOF UNIT DISASSEMBLY/ASSEMBLY.)
3	Glass panel (See 09-15-2 GLASS PANEL REMOVAL/INSTALLATION.) (See 09-15-3 GLASS PANEL ADJUSTMENT.)

4	Rear drain hose (See 09-15-9 REAR DRAIN HOSE REMOVAL.) (See 09-15-10 REAR DRAIN HOSE INSTALLATION.)
5	Sunroof motor (See 09-15-6 SUNROOF MOTOR REMOVAL/INSTALLATION.) (See 09-15-7 SUNROOF MOTOR INSPECTION.)
6	Front drain hose (See 09-15-8 FRONT DRAIN HOSE REMOVAL.) (See 09-15-8 FRONT DRAIN HOSE INSTALLATION.)

SUNROOF SWITCH REMOVAL/INSTALLATION

id091500800200

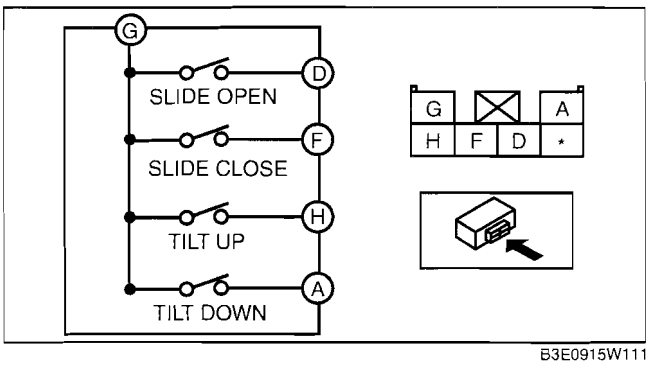
Note
- The sunroof switch and the map light are a single unit.

1. Disconnect the negative battery cable.
2. Remove the map light from the headliner. (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
3. Install in the reverse order of removal.

SUNROOF SWITCH INSPECTION

id091500800300

1. Verify that the continuity between the sunroof switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the sunroof switch.



B3E0915W111

○—○ : Continuity

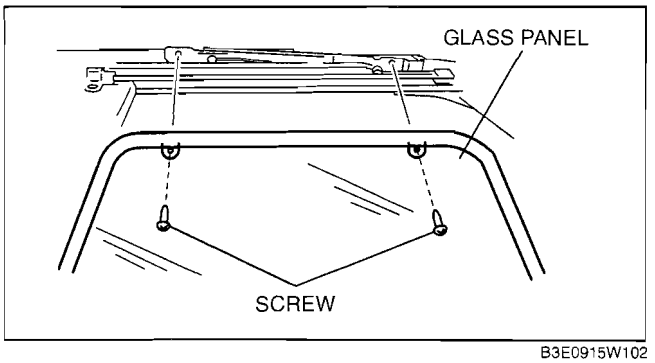
Switch position	Terminal				
	A	D	F	H	G
Slide open		○			○
Slide close			○		○
Tilt up				○	○
Tilt down	○				○
OFF					

B3E0915W112

GLASS PANEL REMOVAL/INSTALLATION

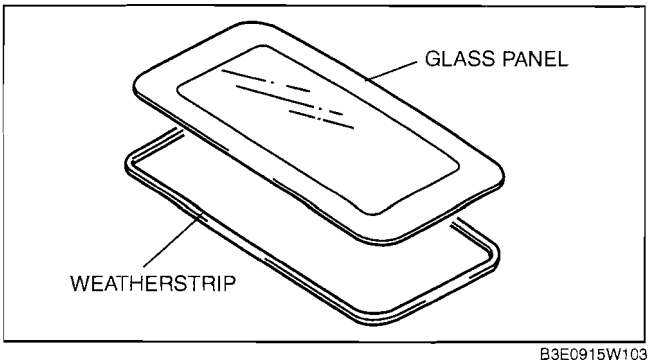
id091500800500

1. Fully close the glass panel.
2. Fully open the sunshade.
3. Remove the screws, then remove the glass panel.



B3E0915W102

4. Remove the weatherstrip from the glass panel.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See 09-15-3 GLASS PANEL ADJUSTMENT.)



B3E0915W103

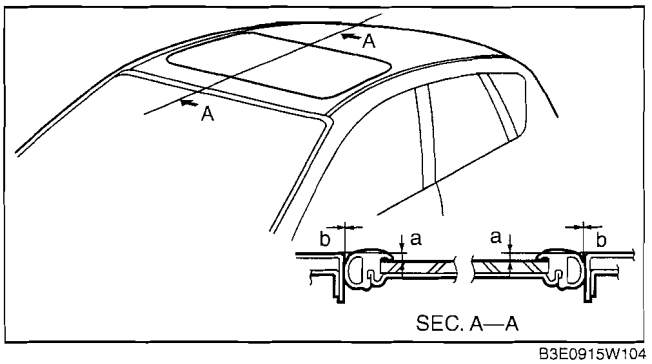
GLASS PANEL ADJUSTMENT

id091500800600

1. Fully close the glass panel.
2. Measure the gap and height difference between the glass panel and the body.
3. Loosen the glass panel installation screws and move the glass panel to adjust.

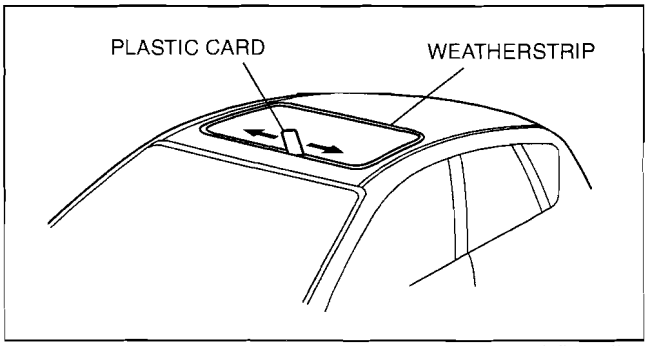
   Standard clearance
   a: 0.2—2.2 mm {0.008—0.08 in}
   b: 0 mm {0 in}

4. Tighten the screws.



B3E0915W104

5. Insert any available thin plastic card between the weatherstrip and the body, and verify that they are sealed. (There is resistance when the plastic card is moved.)
   - If they are not sealed, perform Steps 3—4 and adjust again.

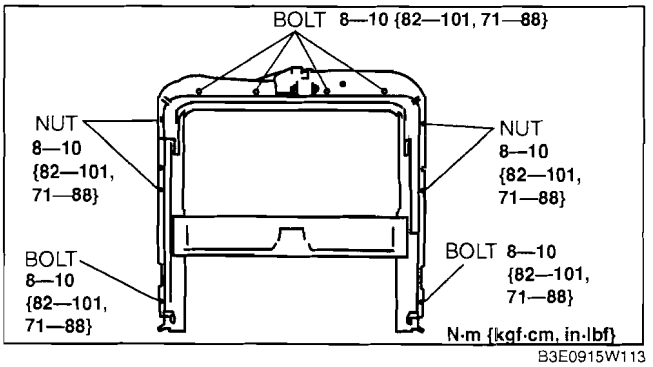


B3E0915W105

SUNROOF UNIT REMOVAL/INSTALLATION

id091500800700

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (16)Head impact pad (See 09-17-16 HEAD IMPACT PAD REMOVAL/INSTALLATION.)
   (17)Glass panel (See 09-15-2 GLASS PANEL REMOVAL/INSTALLATION.)
3. Disconnect the front and rear drain hoses from the sunroof frame.
4. Remove the bolts and nuts, then remove the sunroof unit.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See 09-15-3 GLASS PANEL ADJUSTMENT.)

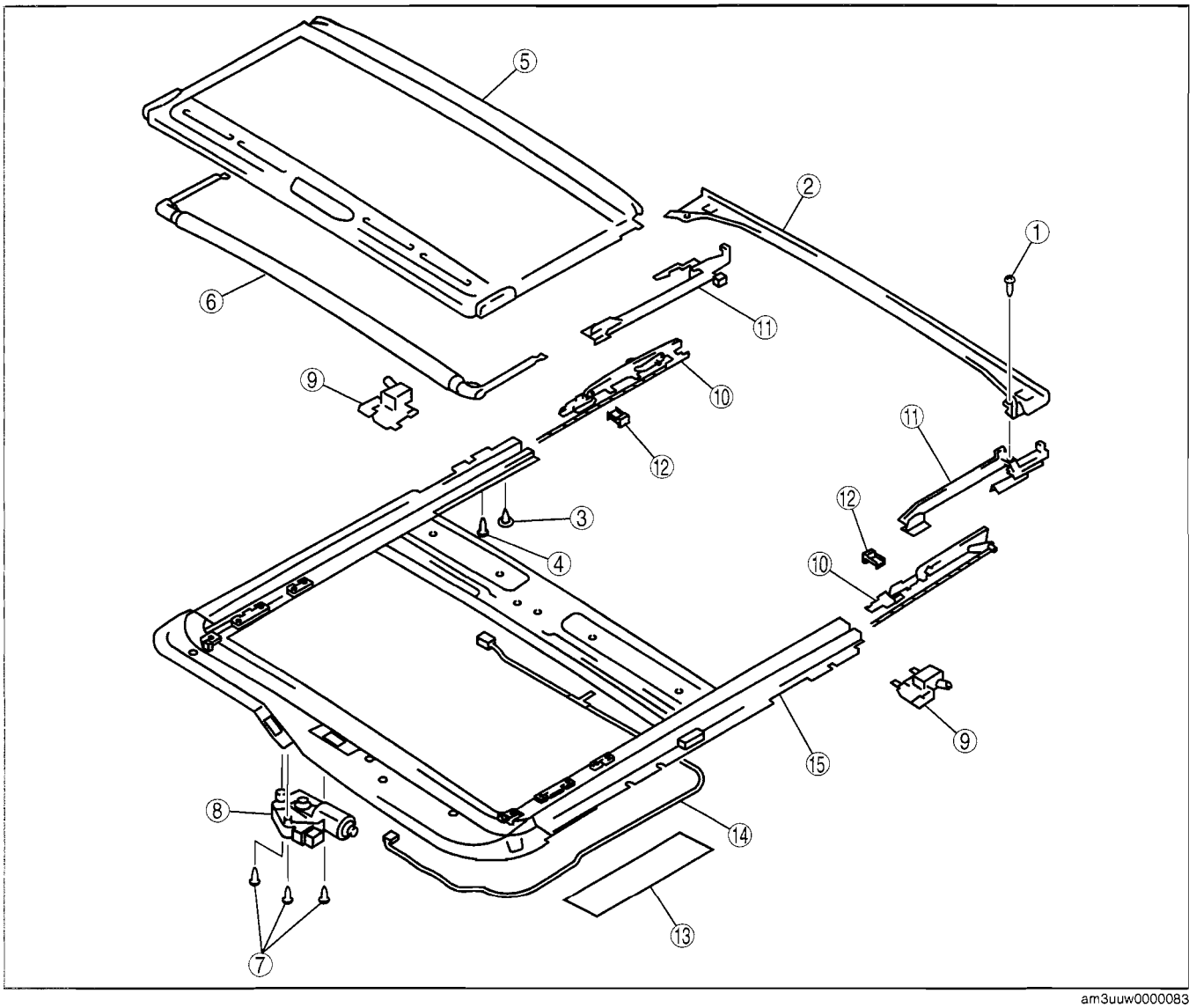


B3E0915W113

SUNROOF UNIT DISASSEMBLY/ASSEMBLY

id091500800800

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000083

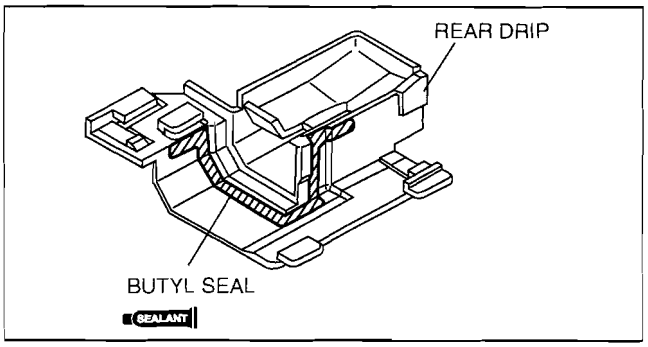
1	Screw A
2	Drip rail
3	Sunshade stopper
4	Screw B
5	Sunshade
6	Deflector
7	Screw C
8	Sunroof motor (See 09-15-5 Sunroof Motor Assembly Note.)

9	Rear drip (See 09-15-5 Rear Drip Assembly Note.)
10	Guide
11	Decoration link
12	Front drip
13	Tape protector
14	Short cord
15	Frame

Rear Drip Assembly Note

Note
- If the rear drip is removed, butyl seal must be applied when re-installing.

1. Apply a **6.0—8.0 mm {0.24—0.31 in}** wide line of butyl seal to the area shown in the figure.



am3uuw0000083

Sunroof Motor Assembly Note

Note
- If the guide is removed, initial position setting of the sunroof motor will be required. After installing the sunroof unit, perform initial position setting using the following procedure.

1. Press the TILT UP switch to fully tilt up the glass panel.
2. When the glass panel reaches the fully tilt up position, temporarily release the TILT UP switch and press it again **for approx. 13 s** continuously. Continue pressing the switch until the glass panel automatically stops at the fully tilt up position after reaching the mechanical lock position.
3. When the glass panel stops at the fully tilt up position, temporarily release the TILT UP switch, then press it again **within 5 s** and hold.

Note
- Press the TILT UP switch continuously until the glass panel opens to the fully open position, returns to the fully closed position and then stops.

4. Release the TILT UP switch when the glass panel stops at the fully closed position.

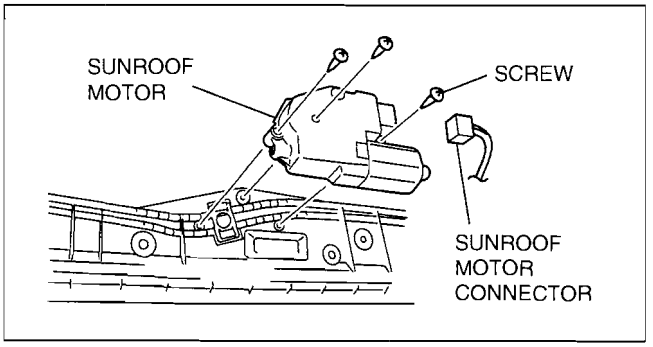
SUNROOF MOTOR REMOVAL/INSTALLATION

id091500805000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
3. Disconnect the sunroof motor connector.
4. Remove the screws, then remove the sunroof motor.
5. Install in the reverse order of removal.

Note

- If the glass panel or the sunroof motor is moved with the sunroof motor removed, initial position setting of the sunroof motor will be required. Perform initial position setting referring to the Sunroof Motor Assembly Note. (See 09-15-4 SUNROOF UNIT DISASSEMBLY/ASSEMBLY.)



am3uuw0000083

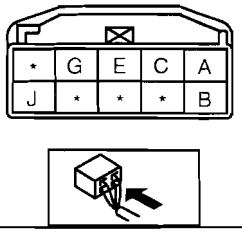
SUNROOF MOTOR INSPECTION

id091500801100

1. Measure the voltage at each terminal (other than terminal G).
   - If not as specified, inspect the parts listed under "Inspection item" and the related wiring harnesses.
2. Disconnect the negative battery cable.
3. Verify that continuity at terminal G is as indicated in the Terminal Voltage Table (Reference).
4. If the parts and wiring harnesses are normal but the system still does not work properly, replace the sunroof relay.

Terminal voltage table (Reference)

SUNROOF MOTOR WIRING HARNESS-SIDE CONNECTOR



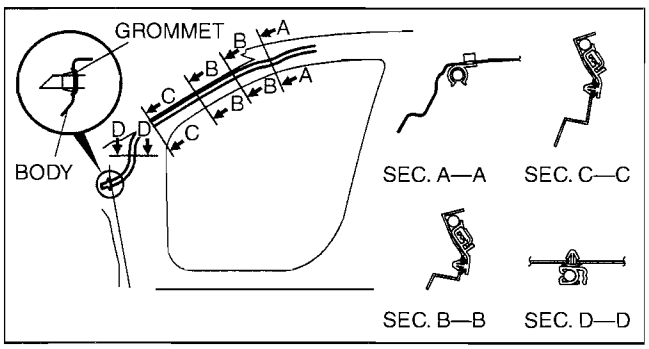
B3E0915W110

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Inspection item
A	Slide open	Sunroof switch	Sunroof is fully opening.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
B	Slide close/tilt down	Sunroof switch	Sunroof is closing/tilting down.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
C	Tilt up	Sunroof switch	Sunroof is tilting up.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
E	IG2	SUNROOF 15 A fuse	Turn the ignition switch to the ON position.	B+	SUNROOF 15 A fuse
G	GND	GND	Under any condition: Check for continuity to ground.	Continuity	GND
J	Power supply	SUNROOF 7.5 A fuse	Under any condition	B+	SUNROOF 7.5 A fuse

FRONT DRAIN HOSE REMOVAL

id091500801300

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (16)Front door (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (17)Dashboard (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
2. Disconnect the front drain hose from the sunroof frame.
3. Remove the front drain hose from the clips.
4. Pull the front drain hose into the vehicle interior and remove the front drain hose.



B3E0915W106

FRONT DRAIN HOSE INSTALLATION

id091500801400

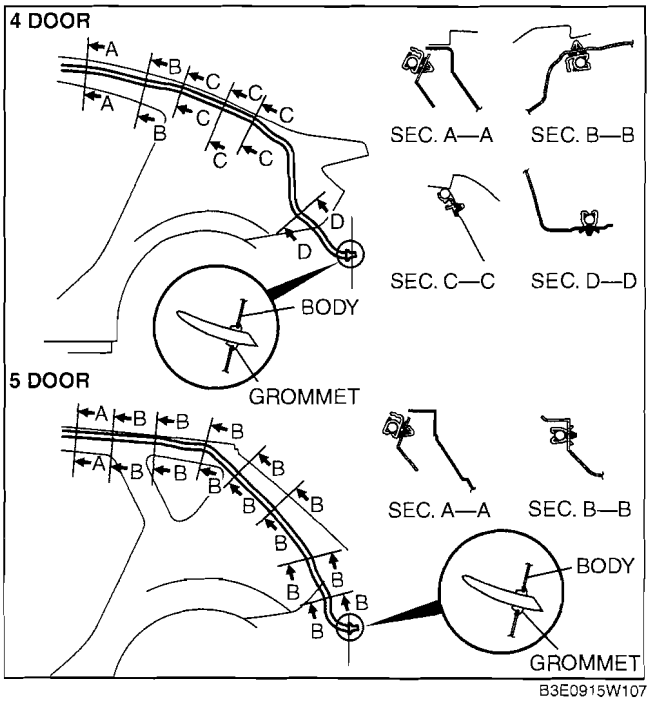
Caution
- **If the front drain hose is pinched or bent at any point, the water in the hose may not drain and could leak inside the vehicle. During and after installation of the trims and headliner, always make sure there is no interference with the front drain hose. Correct any abnormality if found.**

1. Apply soapy water to the part of the sunroof frame where the front drain hose is inserted.
2. Insert the front drain hose end into the sunroof frame.
3. Install the front drain hose to the clips parallel to the pillar and free of looseness.
4. Insert the front drain hose grommet into the hole of the inner hinge pillar.
5. Install the following parts:
   (1) Dashboard (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
   (2) Front door (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (3) Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (4) Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (5) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (6) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (7) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (8) Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (11)B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (12)B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (13)Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (14)Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (15)Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (16)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (17)Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)

REAR DRAIN HOSE REMOVAL

id091500801500

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (11)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (12)Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (13)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (14)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (15)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (16)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (17)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
2. Remove the sunroof frame from the rear drain hose.
3. Remove the rear drain hose from the clips.
4. Pull the rear drain hose into the vehicle interior and remove the rear drain hose.



B3E0915W107

REAR DRAIN HOSE INSTALLATION

id091500801600

Caution

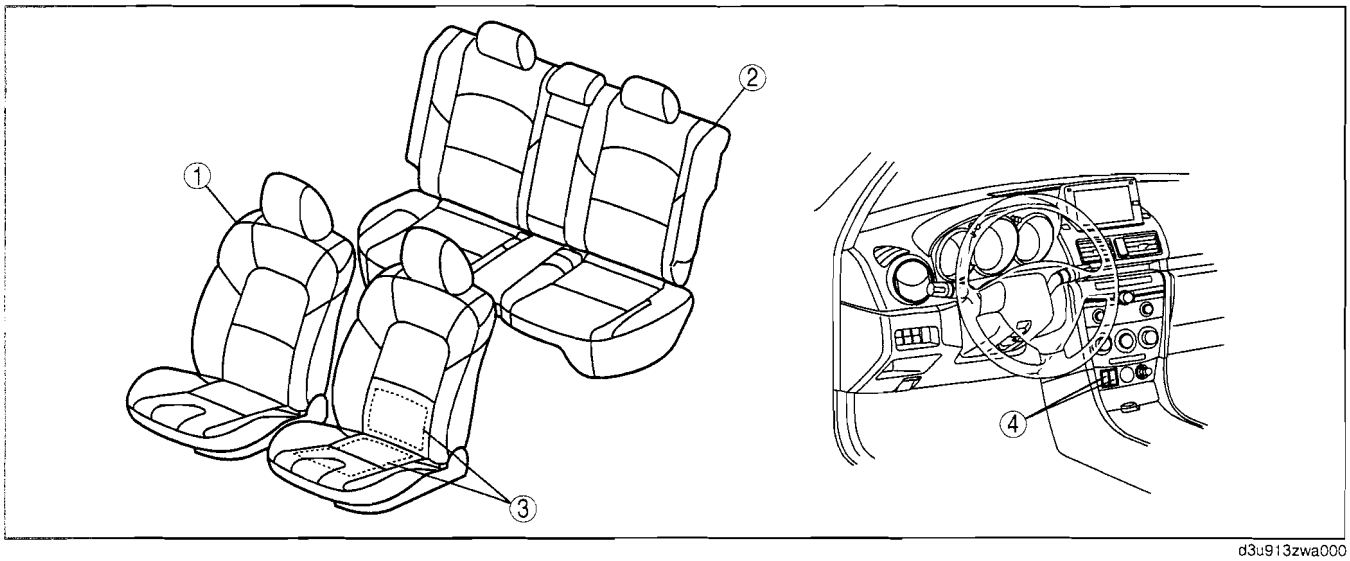
- **If the rear drain hose is pinched or bent at any point, the water in the hose may not drain and could leak inside the vehicle. During and after installation of the trims and headliner, always make sure there is no interference with the rear drain hose. Correct any abnormality if found.**

1. Apply soapy water to the part of the sunroof frame where the rear drain hose is inserted.
2. Insert the rear drain hose end into the sunroof frame.
3. Install the rear drain hose to the clips parallel to the pillar and free of looseness.
4. Insert the rear drain hose grommet into the hole of the inner rear pillar.
5. Install the following parts:
   (1) Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (2) Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (3) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (4) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (5) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (6) Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (7) Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (11)B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (12)B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (13)Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (14)Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (15)Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (16)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (17)Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)

09-13 SEATS

SEATS LOCATION INDEX

id091300803000



d3u913zwa000

1	Front seat (See 09-13-2 FRONT SEAT REMOVAL/ INSTALLATION.) (See 09-13-3 FRONT SEAT DISASSEMBLY/ ASSEMBLY.)
2	Rear seat (See 09-13-6 REAR SEAT REMOVAL/ INSTALLATION.) (See 09-13-7 REAR SEAT DISASSEMBLY/ ASSEMBLY.)

3	Seat warmer unit (See 09-13-9 SEAT WARMER UNIT INSPECTION.)
4	Seat warmer switch (See 09-13-8 SEAT WARMER SWITCH REMOVAL/ INSTALLATION.) (See 09-13-8 SEAT WARMER SWITCH INSPECTION.)

FRONT SEAT REMOVAL/INSTALLATION

id091300800200

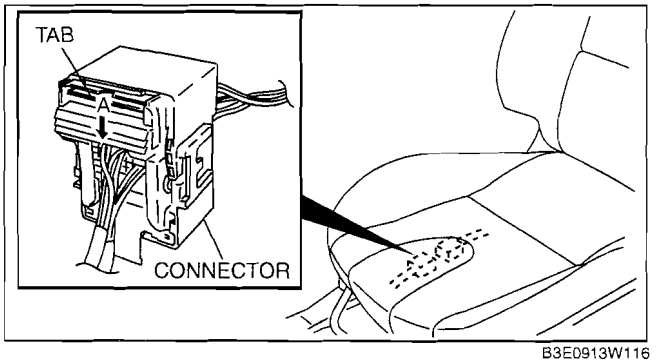
Warning

- **Handling the front seat (side air bag) improperly can accidently deploy the side air bag, which may seriously injure you. Read service warnings and cautions before handling the front seat. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS, 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

Caution

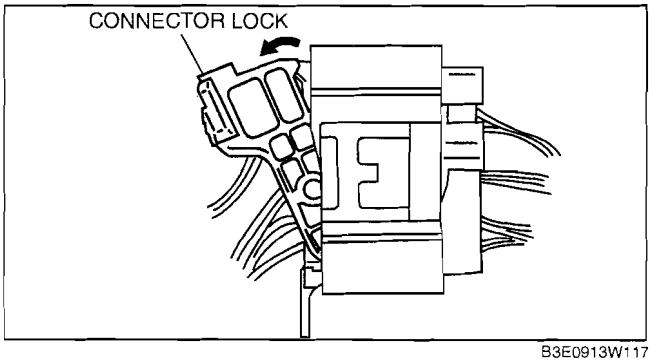
- **For vehicles with the two-step deployment air bag system, when the passenger's seat is removed, perform the seat weight sensor inspection using the M-MDS after installing the passenger's seat. (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)**
- **For vehicles with the two-step deployment air bag system, when the passenger's seat is replaced with a new one, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**

1. Turn the ignition switch to the LOCK position.
2. Disconnect the negative battery cable and wait for **1 min or more**.
3. Press connector tab A in the direction of the arrow.



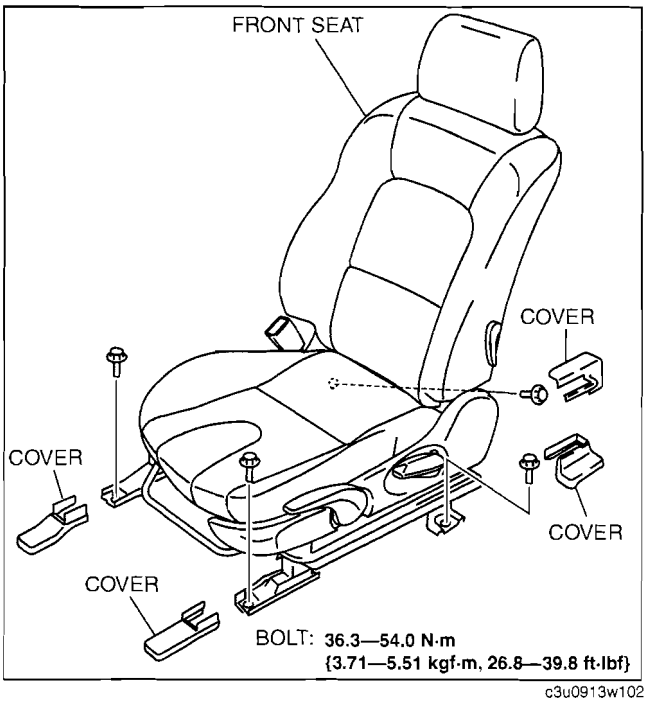
B3E0913W116

4. Pull out the connector lock in the direction of the arrow and disconnect the connector.
5. Remove the seat belt anchor (RH). (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)



B3E0913W117

6. Remove the covers.
7. Remove the bolts, then remove the front seat.
8. Install in the reverse order of removal.
9. Perform the weight sensor initialization procedure. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)



c3u0913w102

FRONT SEAT DISASSEMBLY/ASSEMBLY

id091300800300

Warning

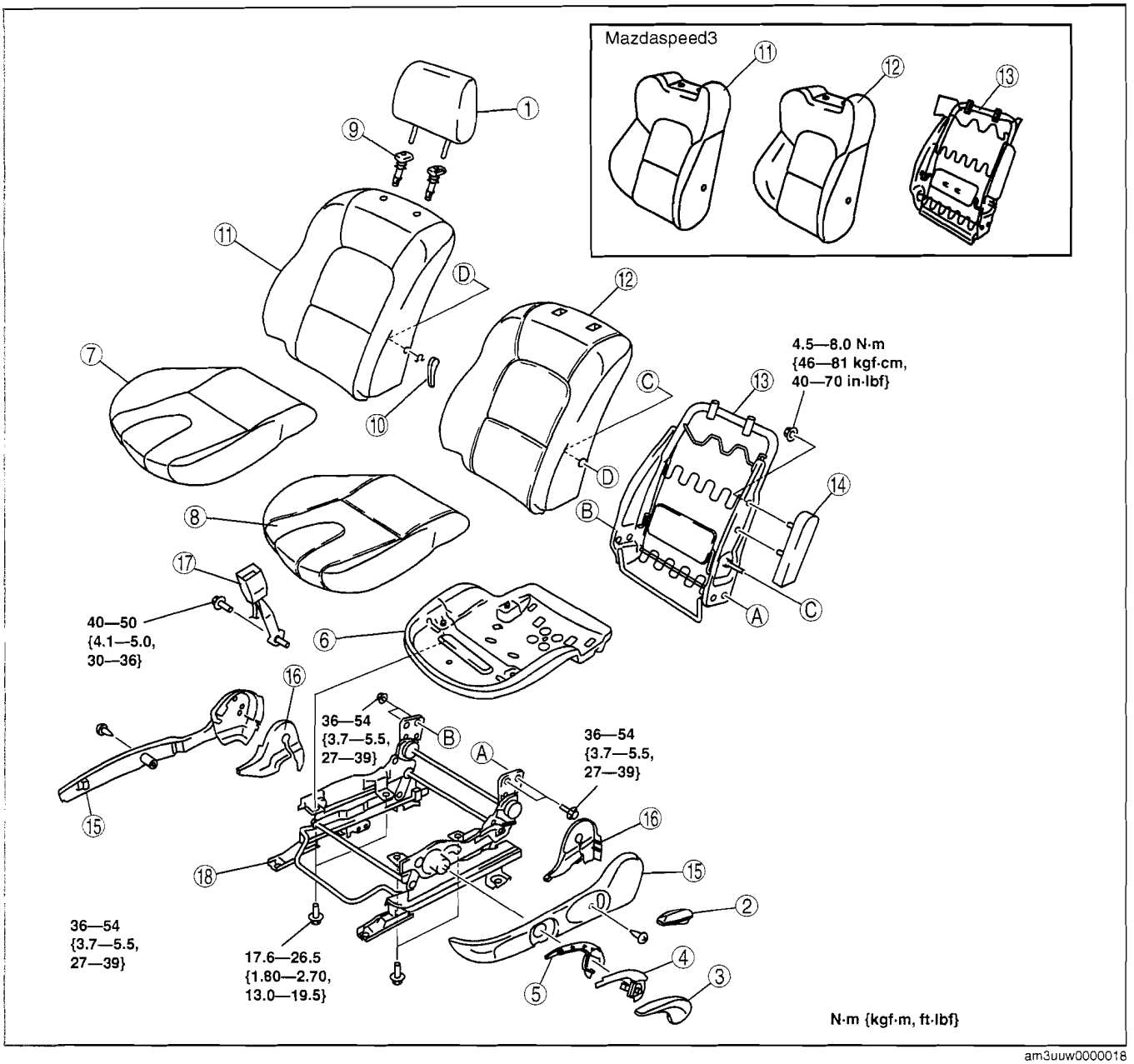
- **Handling the front seat (side air bag, seat weight sensor) improperly can accidentally deploy the side air bag, which may seriously injure you. Read the service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See 08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

Caution

- **For vehicles with the two-step deployment air bag system, if any of the following work is performed, perform the seat weight sensor calibration using the M-MDS. (See 08-10-12 SEAT WEIGHT SENSOR CALIBRATION.)**
  - **— Replacement with a new seat weight sensor**
  - **— Replacement with a new seat weight sensor control module**
  - **— Replacement with new passenger-side seat parts**
  - **— Disassembly of the passenger-side seat**
- **For vehicles with the two-step deployment air bag system, if any of the following work is performed, perform the seat weight sensor inspection using the M-MDS. (See 08-10-13 SEAT WEIGHT SENSOR INSPECTION.)**
  - **— Removal of the passenger-side seat**
  - **— Loosening and retightening of passenger's seat fixing bolts**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

Driver's Seat

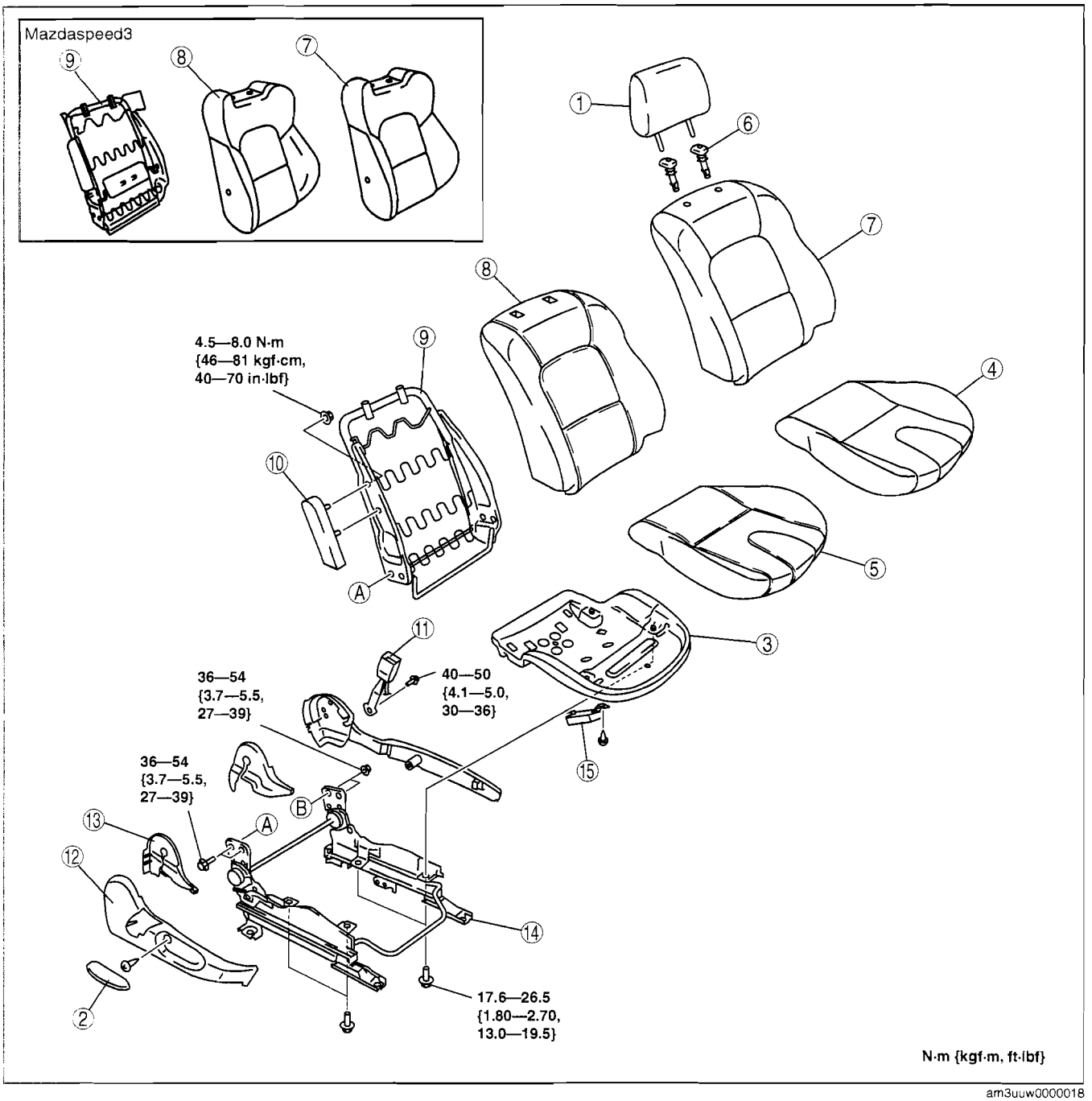


am3uuw0000018

1	Headrest
2	Recliner lever
3	Outer lift lever cover
4	Lift lever
5	Inner lift lever cover
6	Seat cushion frame
7	Seat cushion trim
8	Seat cushion pad
9	Pole guide
10	Lumbar support lever

11	Seat back frame
12	Seat back trim
13	Seat back pad
14	Side air bag module (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
15	Side cover
16	Reverse cover
17	Front buckle
18	Slide adjuster

Passenger's Seat



am3uuw0000018

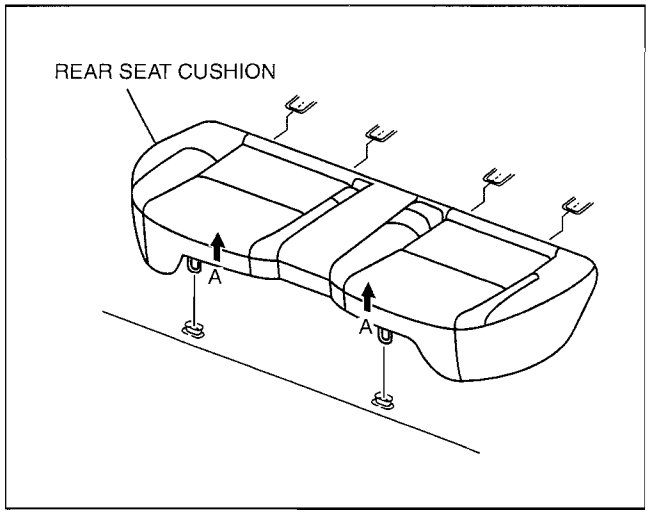
1	Headrest
2	Recliner lever
3	Seat cushion frame
4	Seat cushion trim
5	Seat cushion pad
6	Pole guide
7	Seat back trim
8	Seat back pad

9	Seat back frame
10	Side air bag module (See 08-10-8 SIDE AIR BAG MODULE REMOVAL/ INSTALLATION.)
11	Front buckle
12	Side cover
13	Reverse cover
14	Slide adjuster
15	Seat weight sensor control module

REAR SEAT REMOVAL/INSTALLATION

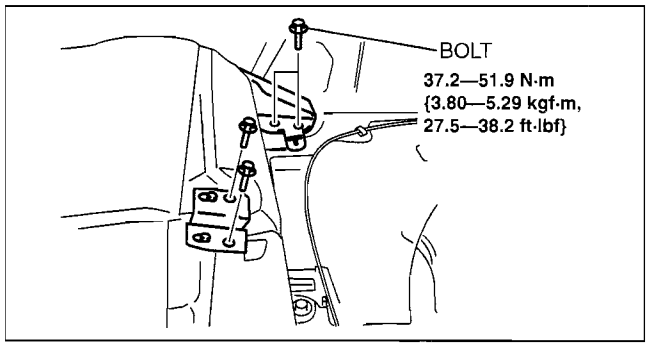
id091300800400

1. Lift points A in the direction of the arrows and remove the rear seat cushion.
2. Fold the rear seat back.



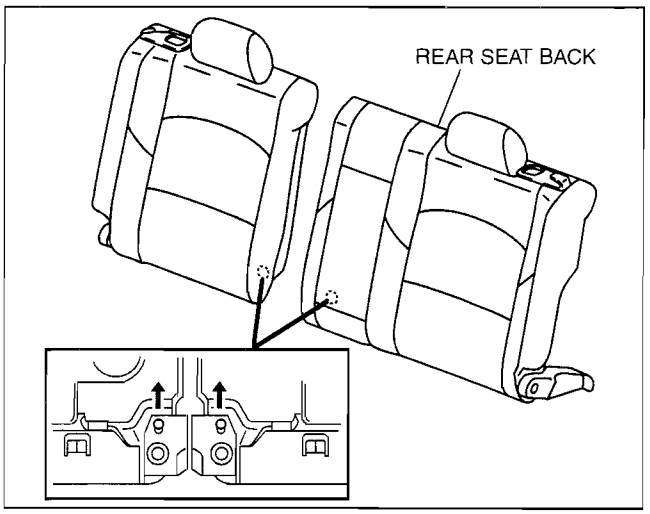
B3E0913W113

3. Remove the bolts.



B3E0913W114

4. Raise the rear seat back in the direction of the arrows and detach the connecting part between the rear seat back and bracket.
5. Remove the rear seat back.
6. Install in the reverse order of removal.

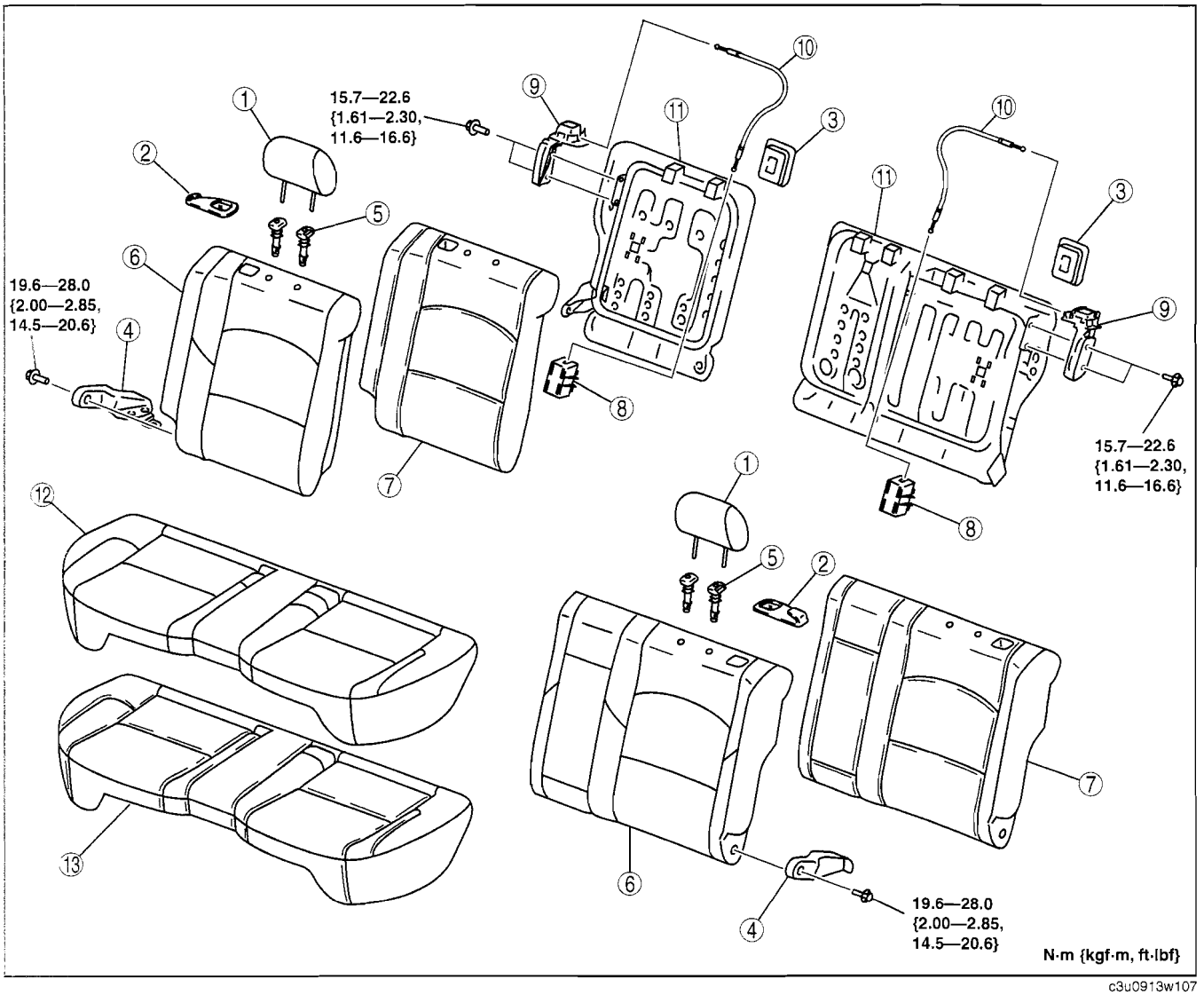


c3u0913w106

REAR SEAT DISASSEMBLY/ASSEMBLY

id091300800500

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



c3u0913w107

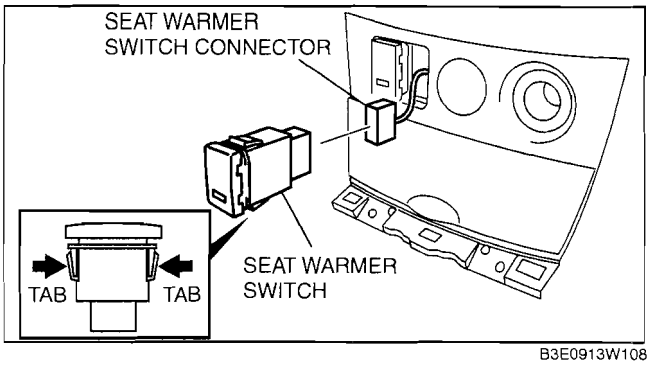
1	Headrest
2	Fold-down switch cover
3	Rear seat back lock cover
4	Rear seat back side hinge
5	Pole guide
6	Rear seat back trim
7	Rear seat back pad

8	Rear seat back lock
9	Fold-down switch
10	Remote wire
11	Rear seat back frame
12	Rear seat cushion trim
13	Rear seat cushion pad

SEAT WARMER SWITCH REMOVAL/INSTALLATION

id091300801200

1. Disconnect the negative battery cable.
2. Remove the ashtray panel. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Disconnect the connector.
4. Squeeze the tabs of seat warmer switch and pull it outward to remove it.
5. Install in the reverse order of removal.

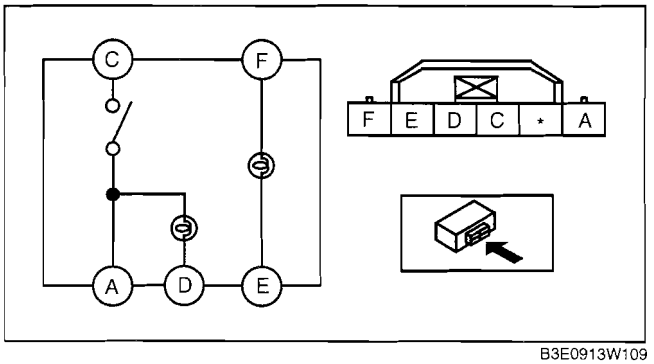


B3E0913W108

SEAT WARMER SWITCH INSPECTION

id091300801300

1. Verify that the continuity between the seat warmer switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the seat warmer switch.



B3E0913W109

○—○ : Continuity ○-⊗-○ : Bulb

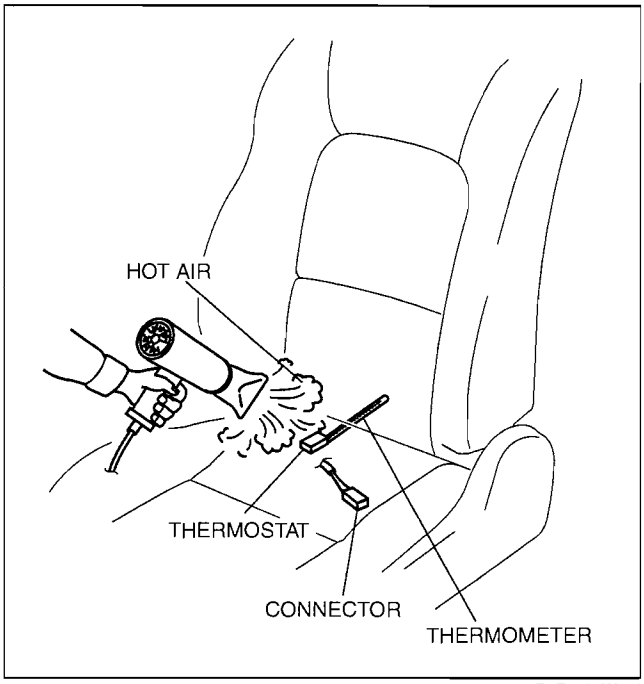
Switch position	Terminal				
	C	A	D	E	F
On	○	○	⊗	○	○
Off				○	○

B3E0913W110

SEAT WARMER UNIT INSPECTION

id091300801400

1. Remove the front seat. (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
2. Remove the seat cushion trim. (See 09-13-3 FRONT SEAT DISASSEMBLY/ASSEMBLY.)
3. While inspecting for continuity between the terminals A and B of the connector, use a dryer to warm the thermostat of the seat warmer unit on seat cushion.



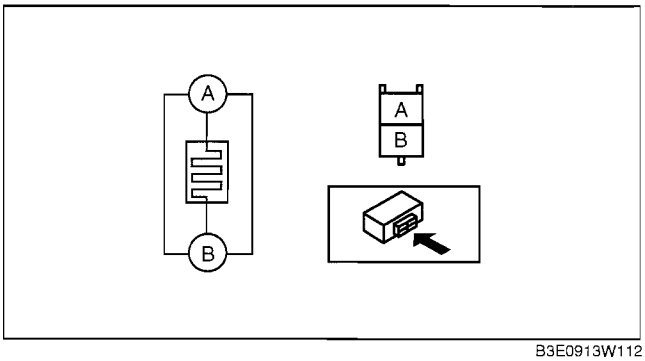
B3E0913W111

4. Verify that the continuity between the seat warmer terminals is as indicated in the table.
   - If not as indicated in the table, replace the seat warmer switch.

O—O : Continuity

Thermostat temperature	Terminal	
	A	B
More than approx. 37 °C {99 °F}		
Less than approx. 27 °C {81 °F}	O	O

B3E0913W115



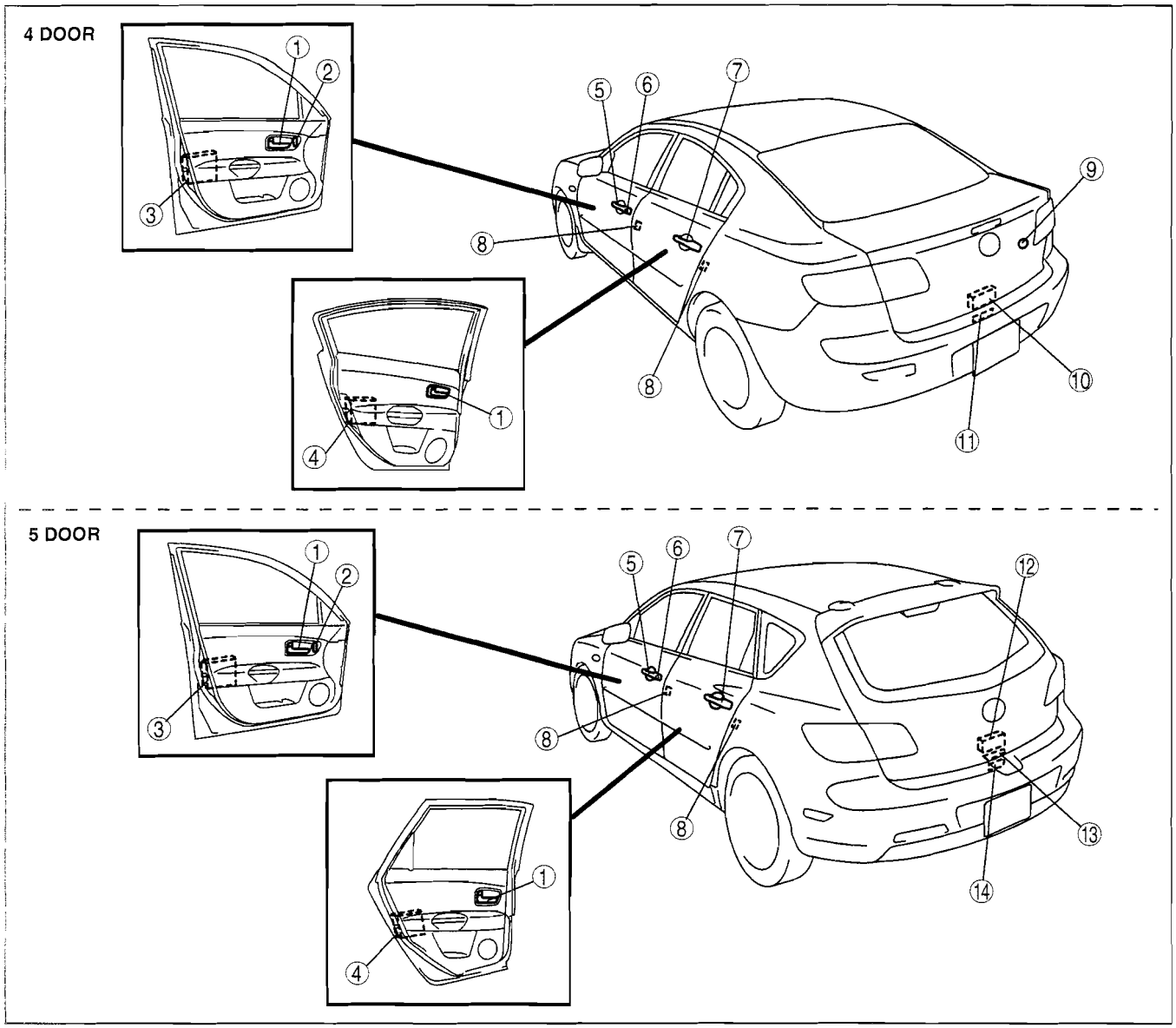
B3E0913W112

09-13

09-14 SECURITY AND LOCKS

SECURITY AND LOCKS LOCATION INDEX

id091400800100



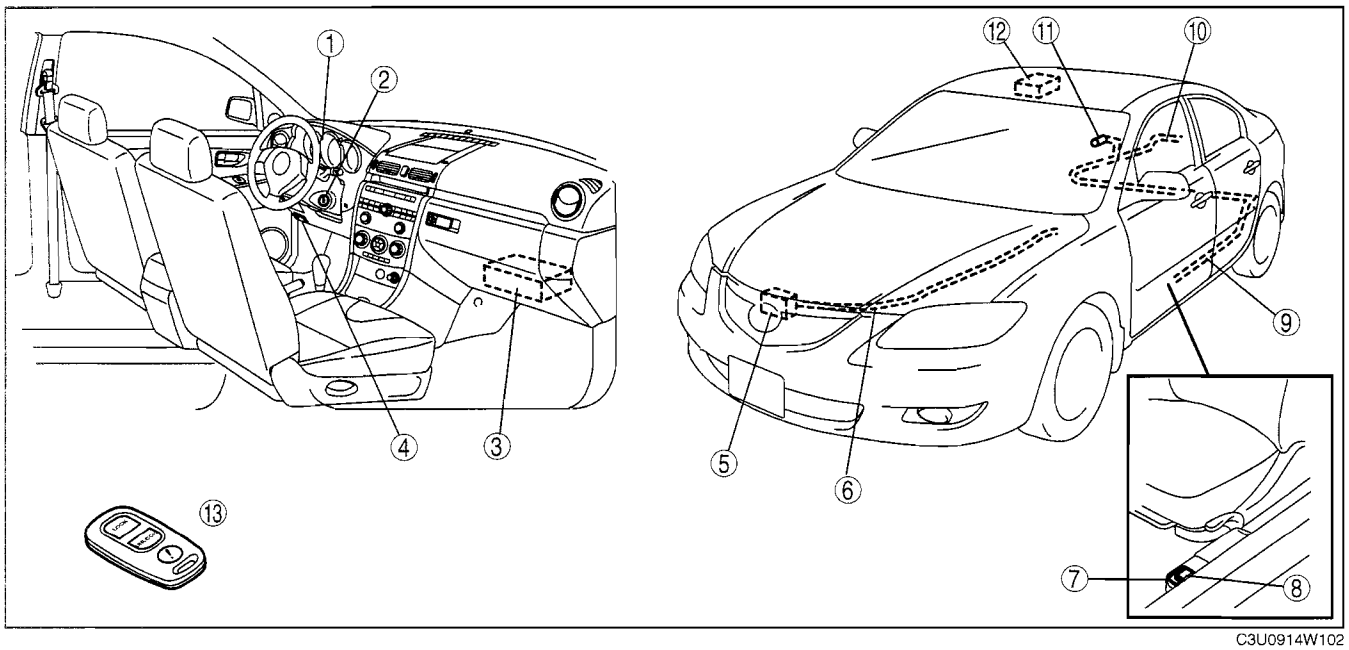
C3U0914W019

1	Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
2	Door lock switch (See 09-14-9 DOOR LOCK SWITCH REMOVAL/INSTALLATION.) (See 09-14-9 DOOR LOCK SWITCH INSPECTION.)
3	Front door latch and lock actuator (See 09-14-5 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-6 FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION.) (See 09-14-7 FRONT DOOR LOCK ACTUATOR INSPECTION.) (See 09-14-7 FRONT DOOR LATCH SWITCH INSPECTION.) (See 09-14-8 DOOR LOCK-LINK SWITCH INSPECTION.) (See 09-14-8 FRONT DOOR KEY CYLINDER SWITCH INSPECTION.)

4	Rear door latch and lock actuator (See 09-14-5 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-6 REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION.) (See 09-14-7 REAR DOOR LOCK ACTUATOR INSPECTION.) (See 09-14-8 REAR DOOR LATCH SWITCH INSPECTION.)
5	Front outer handle (See 09-14-10 FRONT OUTER HANDLE REMOVAL/INSTALLATION.)
6	Front door key cylinder (See 09-14-4 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION.)
7	Rear outer handle (See 09-14-11 REAR OUTER HANDLE REMOVAL/INSTALLATION.)
8	Door lock striker (See 09-14-9 DOOR LOCK STRIKER REMOVAL/INSTALLATION.)

9	Trunk lid key cylinder (See 09-14-28 TRUNK LID KEY CYLINDER REMOVAL/INSTALLATION.) (See 09-14-28 TRUNK LID KEY CYLINDER SWITCH INSPECTION.)
10	Trunk lid latch (See 09-14-28 TRUNK LID LATCH REMOVAL/INSTALLATION.) (See 09-14-29 TRUNK LID LATCH SWITCH INSPECTION.)
11	Trunk lid lock striker (See 09-14-29 TRUNK LID LOCK STRIKER REMOVAL/INSTALLATION.)

12	Liftgate latch and lock actuator (See 09-14-13 LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION.) (See 09-14-13 LIFTGATE LOCK ACTUATOR INSPECTION.) (See 09-14-14 LIFTGATE LATCH SWITCH INSPECTION.)
13	Liftgate outer handle (See 09-14-12 LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION.)
14	Liftgate lid lock striker (See 09-14-14 LIFTGATE LOCK STRIKER REMOVAL/INSTALLATION.)



C3U0914W102

1	Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) (See 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.)
2	Coil antenna (See 09-14-16 COIL ANTENNA REMOVAL/INSTALLATION.)
3	PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.) (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.)
4	Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)

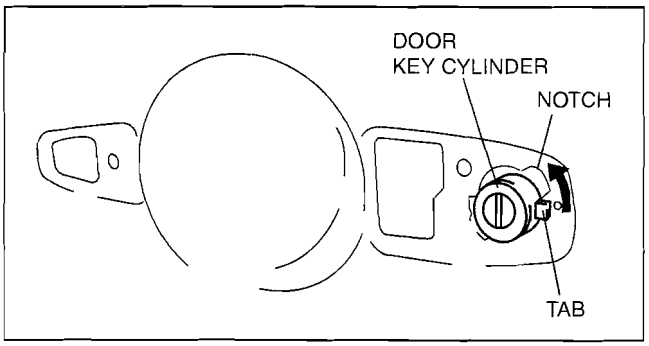
5	Hood latch (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.) (See 09-14-23 HOOD LATCH SWITCH INSPECTION.)
6	Hood cable (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
7	Trunk lid opener lever (See 09-14-30 TRUNK LID OPENER REMOVAL/INSTALLATION.)
8	Fuel-filler lid opener lever (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
9	Fuel-fuller lid opener cable (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
10	Trunk lid opener cable (See 09-14-30 TRUNK LID OPENER REMOVAL/INSTALLATION.)

11	Fuel-fuller lid opener (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
12	Keyless control module (See 09-14-27 KEYLESS CONTROL MODULE REMOVAL/INSTALLATION.) (See 09-14-27 KEYLESS CONTROL MODULE INSPECTION.)
13	Transmitter (See 09-14-24 TRANSMITTER BATTERY REPLACEMENT.) (See 09-14-25 TRANSMITTER BATTERY INSPECTION.) (See 09-14-26 TRANSMITTER ID CODE REGISTRATION.)

FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION

id091400800300

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Fully roll up the front door glass.
3. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front outer handle (See 09-14-10 FRONT OUTER HANDLE REMOVAL/INSTALLATION.)
4. Remove the rod from the front door key cylinder.
5. Turn the key cylinder in the direction indicated by the arrow and move the tab to the notch.
6. Pull the front door key cylinder outward to remove it.
7. Install in the reverse order of removal.

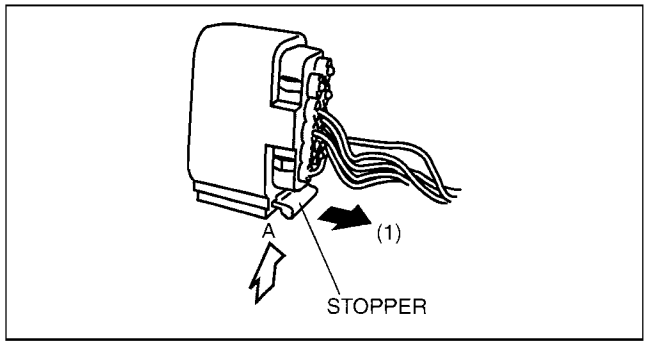


B6U0914WS20

FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

id091400800400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
   (2) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (3) Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
   (4) Front door glass (See 09-12-4 FRONT DOOR GLASS REMOVAL/INSTALLATION.)
   (5) Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/INSTALLATION.)
   (6) Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
   (7) Front door unit (See 09-11-6 FRONT DOOR UNIT REMOVAL/INSTALLATION.)
3. Pull the stopper of the front door lock actuator connector in the direction of the arrow (1).
4. Disconnect the front door lock actuator connector while pushing at point A.
5. Remove the front door latch and lock actuator from the front door unit.
6. Install in the reverse order of removal.



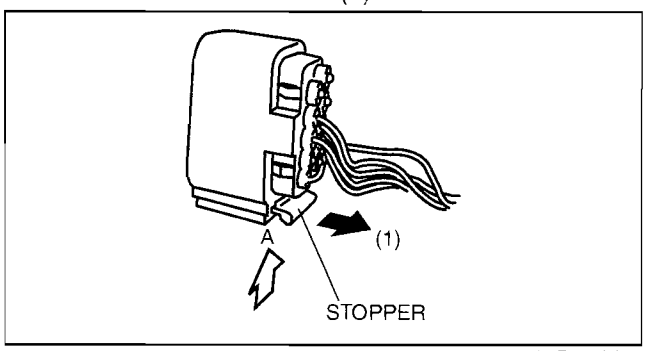
B3E0914W043

REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

id091400800500

09-14

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Sail garnish (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
   (2) Rear door garnish (5 door) (See 09-16-3 REAR DOOR GARNISH REMOVAL/INSTALLATION.)
   (3) Regulator handle (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
   (4) Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
   (5) Rear door glass (See 09-12-5 REAR DOOR GLASS REMOVAL/INSTALLATION.)
   (6) Rear door speaker (See 09-20-8 REAR DOOR SPEAKER REMOVAL/INSTALLATION.)
   (7) Inner handle (See 09-14-12 INNER HANDLE REMOVAL/INSTALLATION.)
   (8) Rear door unit (See 09-11-7 REAR DOOR UNIT REMOVAL/INSTALLATION.)
3. Pull the stopper of the rear door lock actuator connector in the direction of the arrow (1).
4. Disconnect the rear door lock actuator connector while pushing at point A.
5. Remove the rear door latch and lock actuator from the rear door unit.
6. Install in the reverse order of removal.

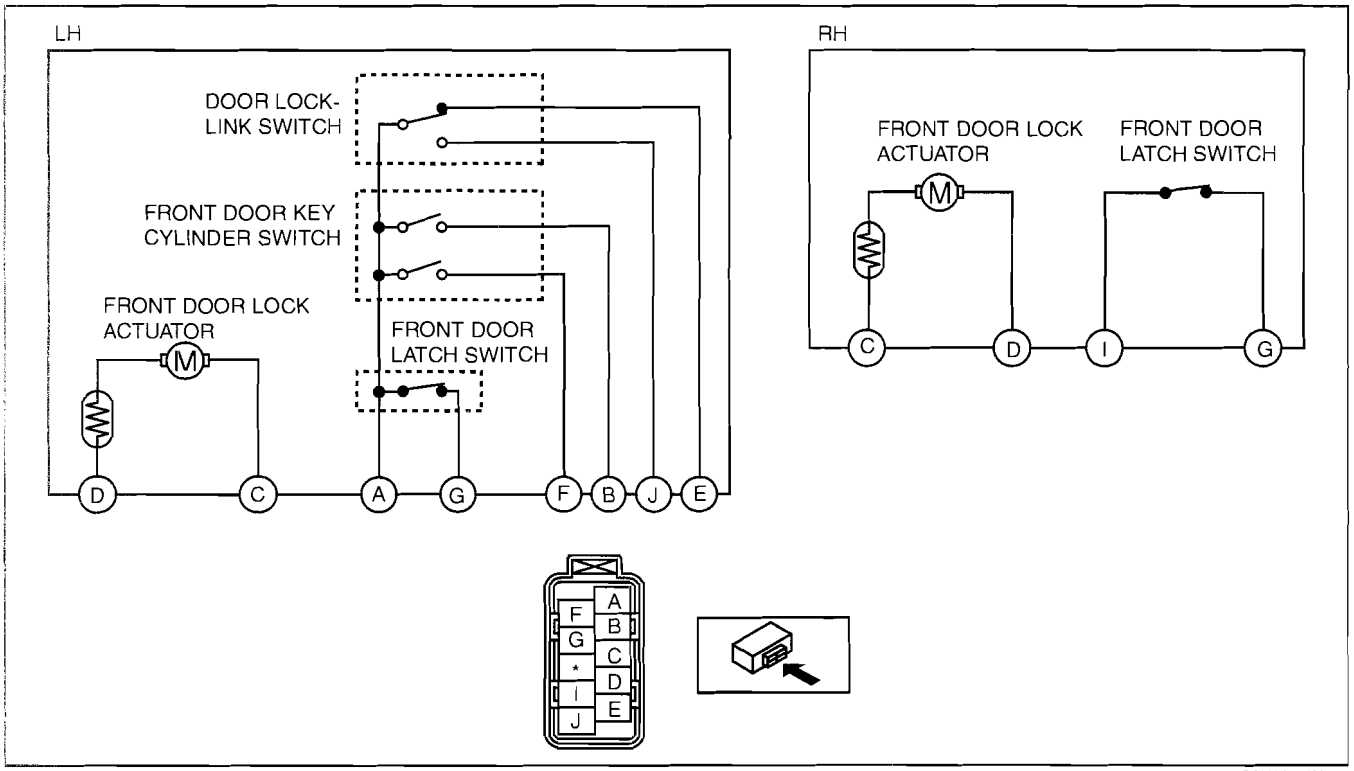


B3E0914W043

FRONT DOOR LATCH AND LOCK ACTUATOR INSPECTION

id091400800600

1. The following actuators and switches are integrated with the front door latch and lock actuator. Inspect the front door latch and lock actuator according to each inspection procedure for the following items.
   - Front door lock actuator (See 09-14-7 FRONT DOOR LOCK ACTUATOR INSPECTION.)
   - Front door latch switch (See 09-14-7 FRONT DOOR LATCH SWITCH INSPECTION.)
   - Front door key cylinder switch (Driver's side) (See 09-14-8 FRONT DOOR KEY CYLINDER SWITCH INSPECTION.)
   - Door lock-link switch (Driver's side) (See 09-14-8 DOOR LOCK-LINK SWITCH INSPECTION.)

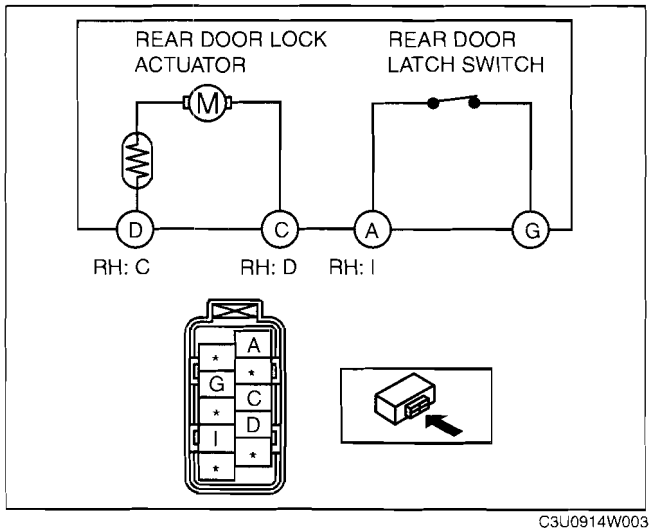


C3U0914W103

REAR DOOR LATCH AND LOCK ACTUATOR INSPECTION

id091400800700

1. The following actuator and switch are integrated with the rear door latch and lock actuator. Inspect the rear door latch and lock actuator according to each inspection procedure for the following items.
   - Rear door lock actuator (See 09-14-7 REAR DOOR LOCK ACTUATOR INSPECTION.)
   - Rear door latch switch (See 09-14-8 REAR DOOR LATCH SWITCH INSPECTION.)



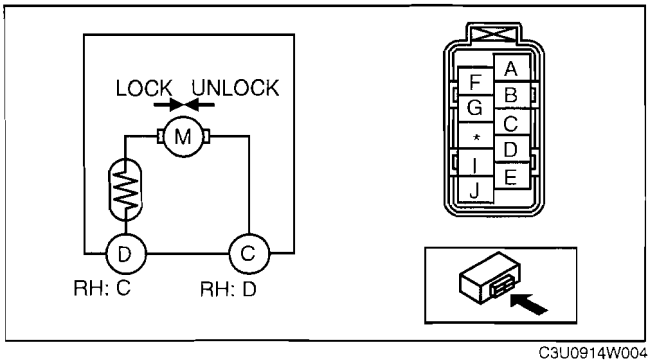
C3U0914W003

FRONT DOOR LOCK ACTUATOR INSPECTION

1. Apply battery positive voltage and connect ground to the corresponding front door lock actuator terminals, and inspect the front door lock actuator operation.
   - If not as specified, replace the front door latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	LH: D RH: C	LH: C RH: D
Unlock	LH: C RH: D	LH: D RH: C

id091400800800



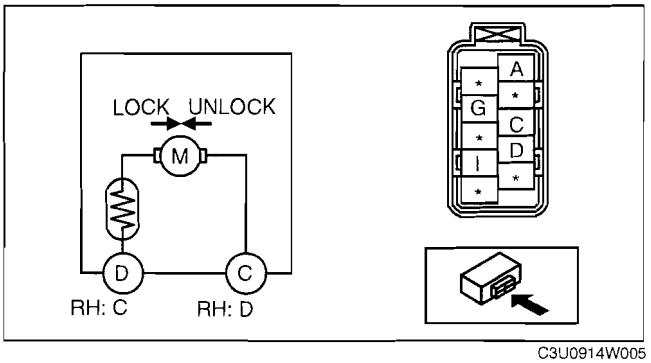
C3U0914W004

REAR DOOR LOCK ACTUATOR INSPECTION

1. Apply battery positive voltage and connect ground to the corresponding rear door lock actuator terminals, and inspect the rear door lock actuator operation.
   - If not as specified, replace the rear door latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	LH: D RH: C	LH: C RH: D
Unlock	LH: C RH: D	LH: D RH: C

id091400800900



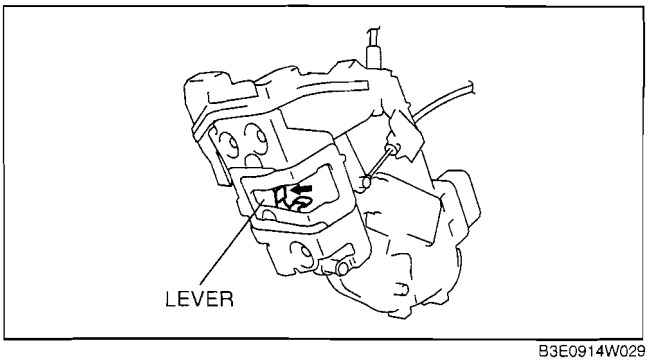
C3U0914W005

09-14

FRONT DOOR LATCH SWITCH INSPECTION

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.

id091400801000



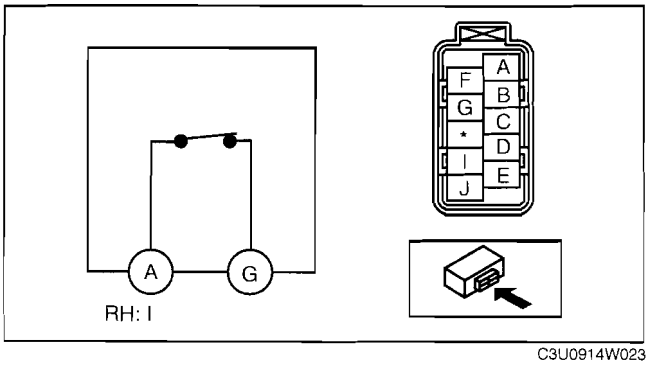
B3E0914W029

2. Inspect for continuity between the front door latch switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	LH: A RH: I	G
Latch (door is closed)	O	O
Unlatch (door is open)		

B3E0914W012

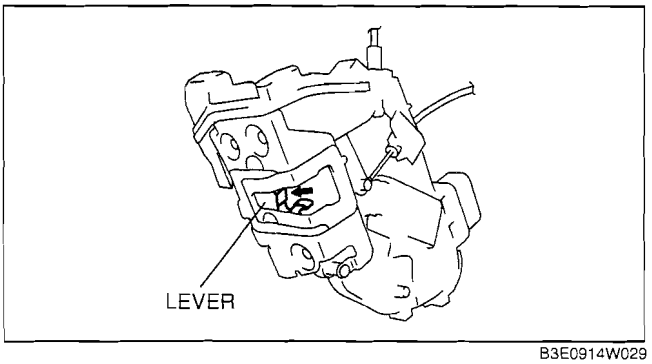


C3U0914W023

REAR DOOR LATCH SWITCH INSPECTION

id091400801100

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



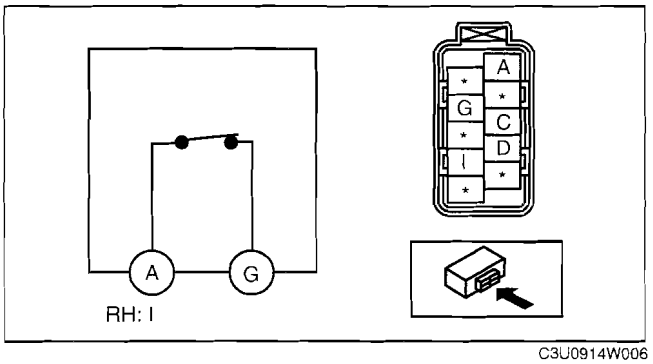
B3E0914W029

2. Inspect for continuity between the rear door latch switch terminals.
   - If not as specified, replace the rear door latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	LH: A RH: I	G
Latch (door is closed)	O	O
Unlatch (door is open)		

B3E0914W012



C3U0914W006

DOOR LOCK-LINK SWITCH INSPECTION

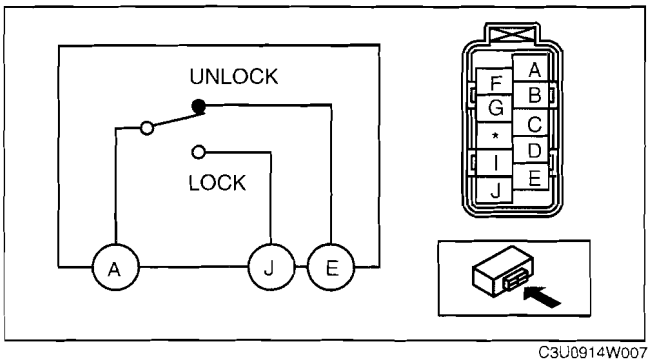
id091400801200

1. Inspect for continuity between the door lock-link switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Lock knob position	Terminal		
	E	LH: A RH: I	J
Lock		O	O
Unlock	O	O	

B3E0914W014



C3U0914W007

FRONT DOOR KEY CYLINDER SWITCH INSPECTION

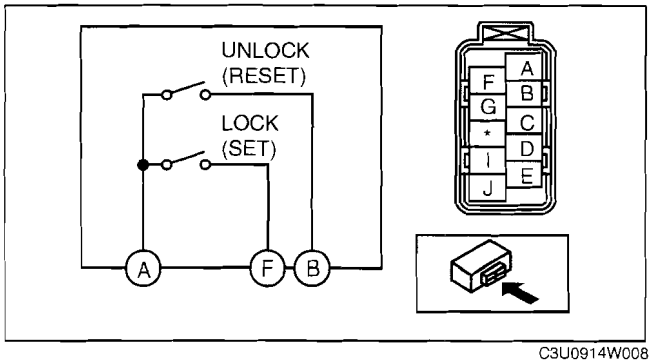
id091400801300

1. Inspect for continuity between the front door key cylinder switch terminals.
   - If not as specified, replace the front door latch and lock actuator.

O—O : Continuity

Key cylinder position	Terminal		
	B	LH: A RH: I	F
Lock (Set)		O	O
Unlock (Reset)	O	O	
Neutral			

B3E0914W016

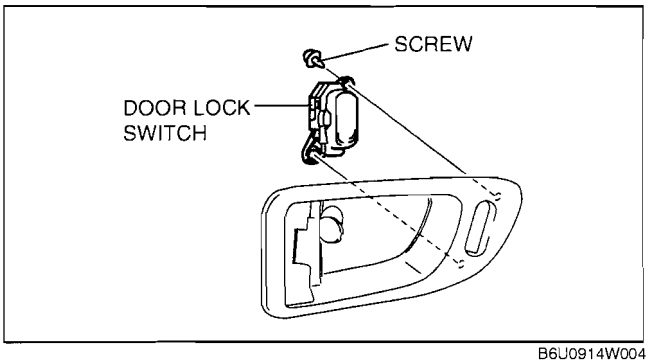


C3U0914W008

DOOR LOCK SWITCH REMOVAL/INSTALLATION

id091400801400

1. Disconnect the negative battery cable.
2. Remove the inner handle cover. (See09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
3. Remove the screws, then remove the door lock switch.
4. Install in the reverse order of removal.



B6U0914W004

DOOR LOCK SWITCH INSPECTION

id091400801500

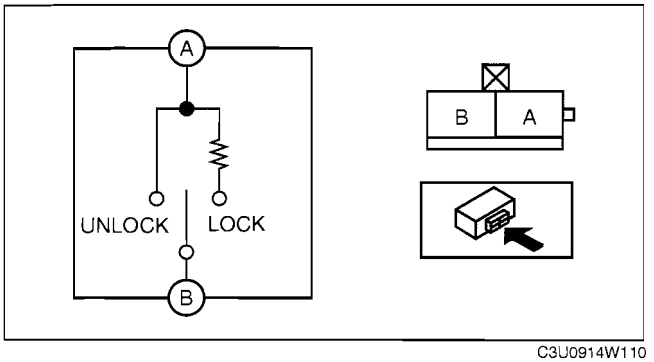
1. Inspect for continuity between the door lock switch terminals using an ohmmeter.
   - If not as specified, replace the door lock switch.

O—O: Continuity O-WW-O: Resistance

Position	Terminal	
	A	B
Lock	O—WW—	—O R
Unlock	O—	—O

R: 940—1,060 ohms

C3U0914W009

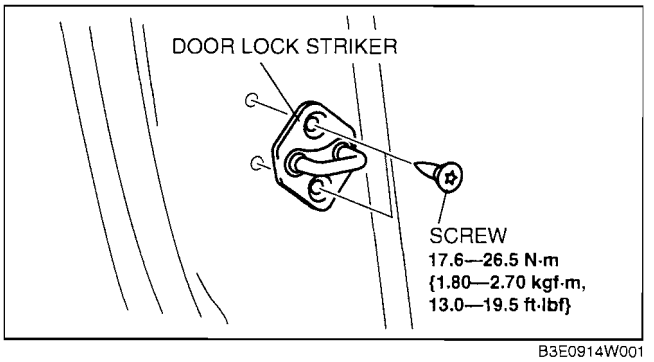


C3U0914W110

DOOR LOCK STRIKER REMOVAL/INSTALLATION

id091400801600

1. Remove the screws, then remove the door lock striker.
2. Install in the reverse order of removal.
3. Adjust the door. (See 09-11-5 DOOR ADJUSTMENT.)

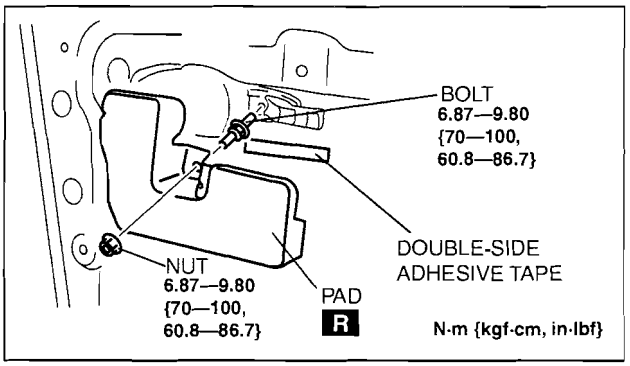


B3E0914W001

FRONT OUTER HANDLE REMOVAL/INSTALLATION

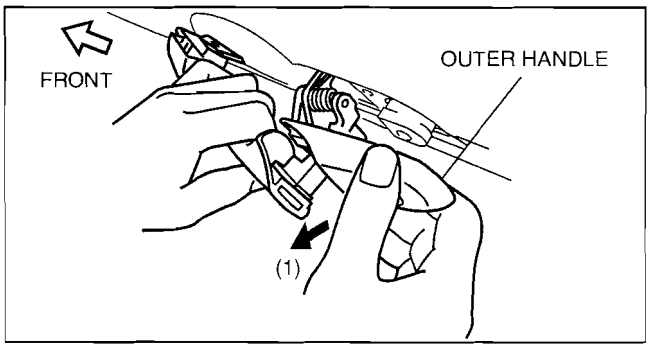
id091400803100

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Fully roll up the front door glass.
3. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
5. Remove the front door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
6. Remove the hole cover.
7. Remove the nut, then remove the pad.
8. Remove the bolt.
9. Detach the rod from the outer handle.



B3E0914W040

10. Secure the rear part of the front outer handle and, with the front outer handle lever pulled outward (1), remove the rear part of the front outer handle from the front door.
11. Pull out the front side of the front outer handle from the front door.
12. Install in the reverse order of removal.

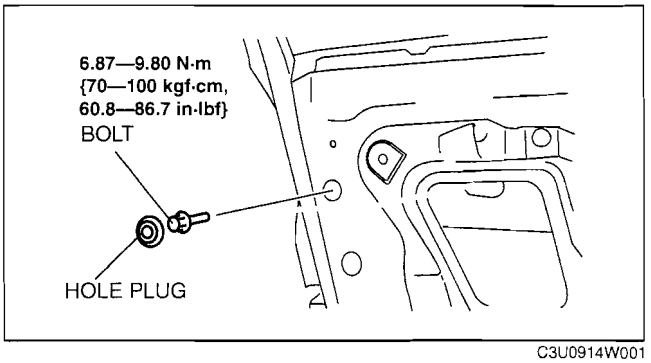


A6E7714W005

REAR OUTER HANDLE REMOVAL/INSTALLATION

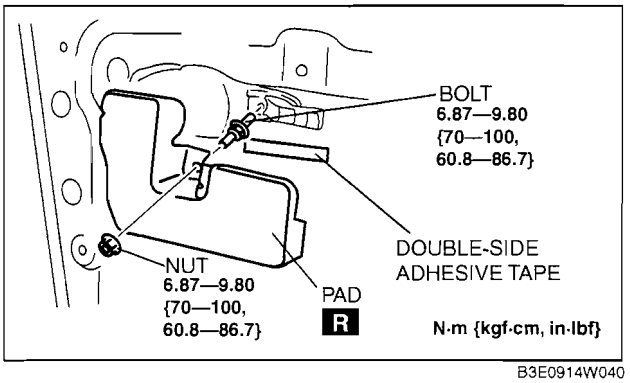
id091400803200

1. Disconnect the negative battery cable. (Vehicles with power window system)
2. Fully roll up the rear door glass.
3. Remove the sail garnish. (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
5. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
6. Remove the hole cover.
7. Remove the hole plug.
8. Remove the bolt.
9. Remove the nut, then remove the pad.



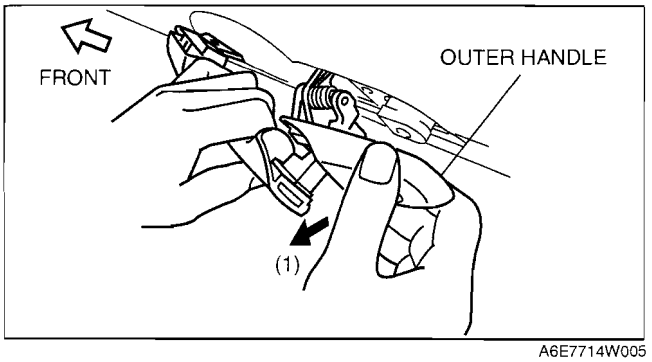
C3U0914W001

10. Remove the bolt.
11. Detach the rod from the outer handle.



B3E0914W040

12. Secure the rear part of the rear outer handle and, with the rear outer handle lever pulled outward (1), remove the rear part of the rear outer handle from the rear door.
13. Install in the reverse order of removal.

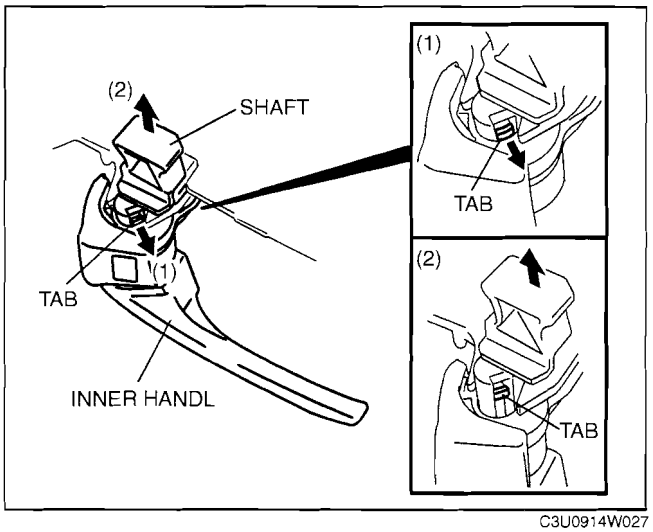


A6E7714W005

INNER HANDLE REMOVAL/INSTALLATION

id091400803300

1. Disconnect the negative battery cable. (Vehicles with power window system or power outer mirror)
2. Remove the inner garnish. (front) (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
3. Remove the regulator handle. (Vehicles with manual window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See 09-12-12 REGULATOR HANDLE INSTALLATION.)
4. Remove the front door trim or rear door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.) (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
5. Using a flathead screwdriver, press and hold the tab in the direction indicated by arrow (1), and remove the shaft by pulling it in the direction indicated by arrow (2).
6. Pull off the inner handle, and remove the door lock knob cable and inner handle cable.
7. Install in the reverse order of removal.

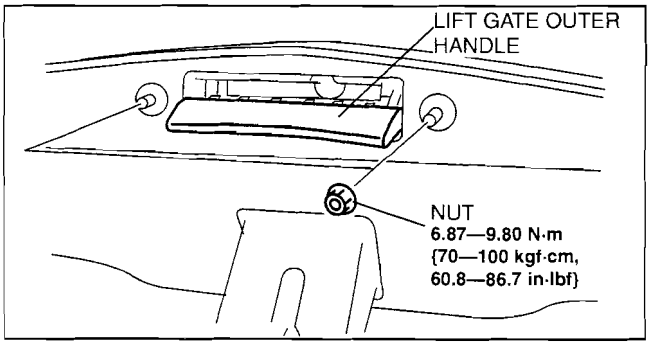


C3U0914W027

LIFTGATE OUTER HANDLE REMOVAL/INSTALLATION

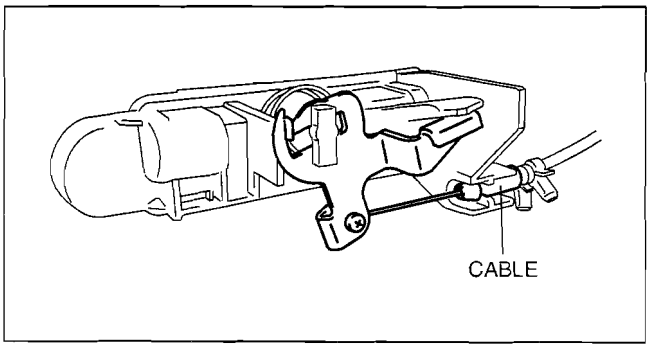
id091400803700

1. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
2. Remove the liftgate side trim. (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove the liftgate lower trim. (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
4. Remove the nuts.



B3E0914W032

5. Detach the cable.
6. Install in the reverse order of removal.

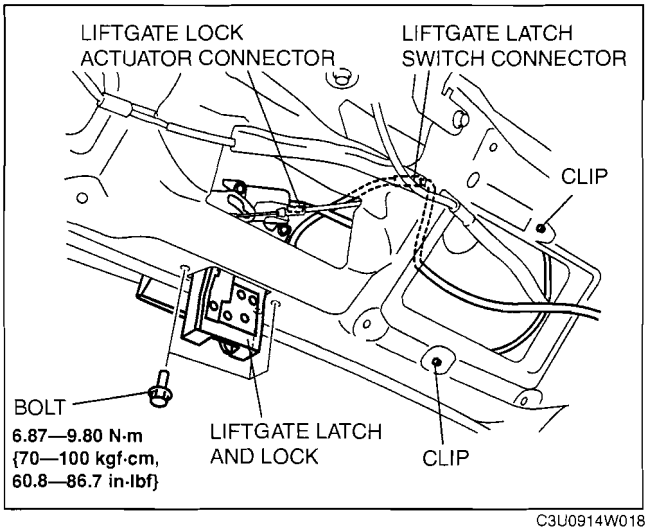


B3E0914W033

LIFTGATE LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

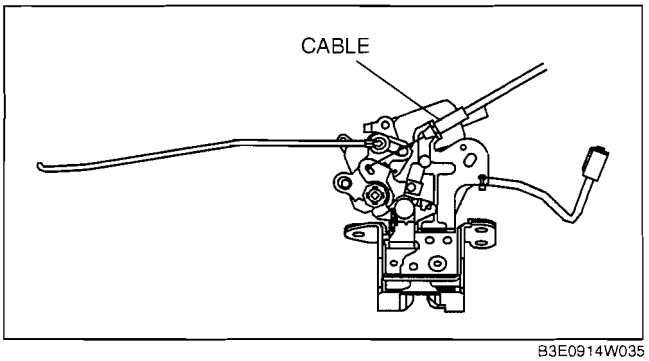
id091400803800

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove the liftgate side trim. (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
4. Remove the liftgate lower trim. (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
5. Disconnect the liftgate lock actuator connector and liftgate latch switch connector.
6. Detach the rod from the liftgate key cylinder.
7. Remove the clips.
8. Remove the bolts.
9. Remove the liftgate latch and lock actuator



C3U0914W018

10. Detach the cable from the liftgate latch and lock actuator.
11. Install in the reverse order of removal.



B3E0914W035

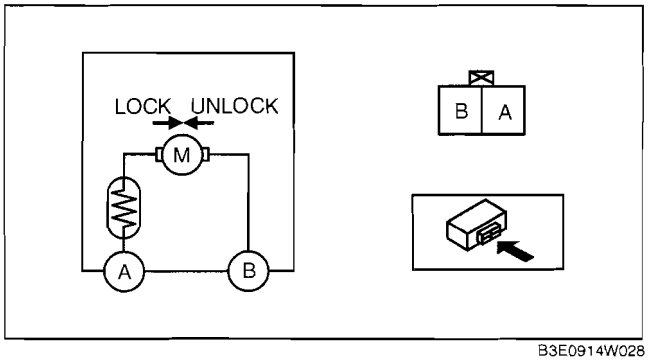
09-14

LIFTGATE LOCK ACTUATOR INSPECTION

id091400803900

1. Apply battery positive voltage and connect ground to the corresponding liftgate lock actuator terminals, and inspect the liftgate lock actuator operation.
   - If not as specified, replace the liftgate latch and lock actuator.

Lock actuator operation	Connection	
	B+	GND
Lock	A	B
Unlock	B	A

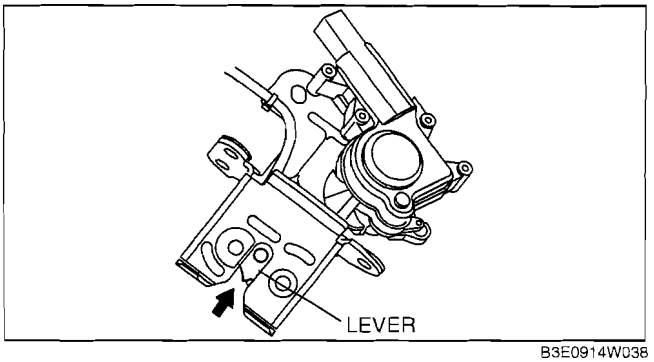


B3E0914W028

LIFTGATE LATCH SWITCH INSPECTION

id091400804000

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



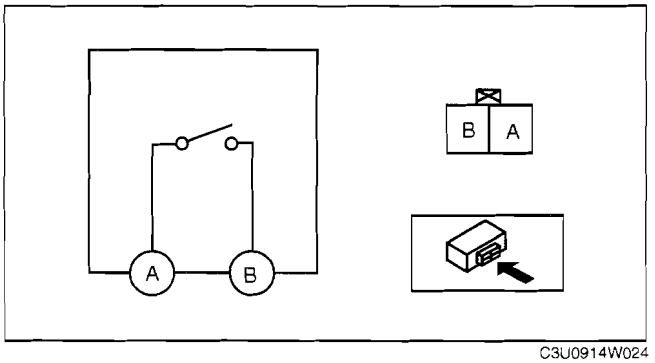
B3E0914W038

2. Inspect for continuity between the liftgate latch switch terminals.
   - If not as specified, replace the liftgate latch and lock actuator.

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (liftgate is closed)		
Unlatch (liftgate is open)	O	O

B3E0914W021

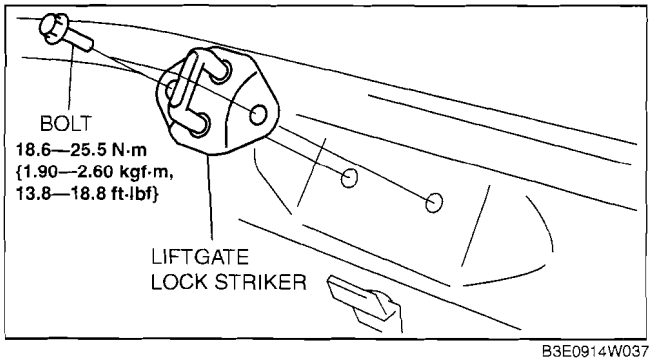


C3U0914W024

LIFTGATE LOCK STRIKER REMOVAL/INSTALLATION

id091400804100

1. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
2. Remove the bolts, then remove the liftgate lock striker.
3. Install in the reverse order of removal.
4. Adjust the liftgate. (See 09-11-9 LIFTGATE ADJUSTMENT.)

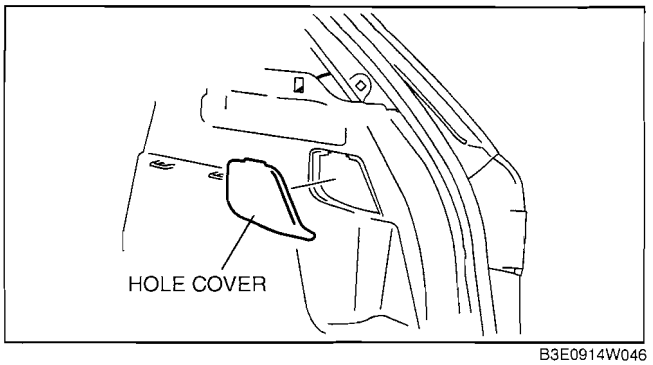


B3E0914W037

FUEL-FILLER LID OPENER REMOVAL/INSTALLATION

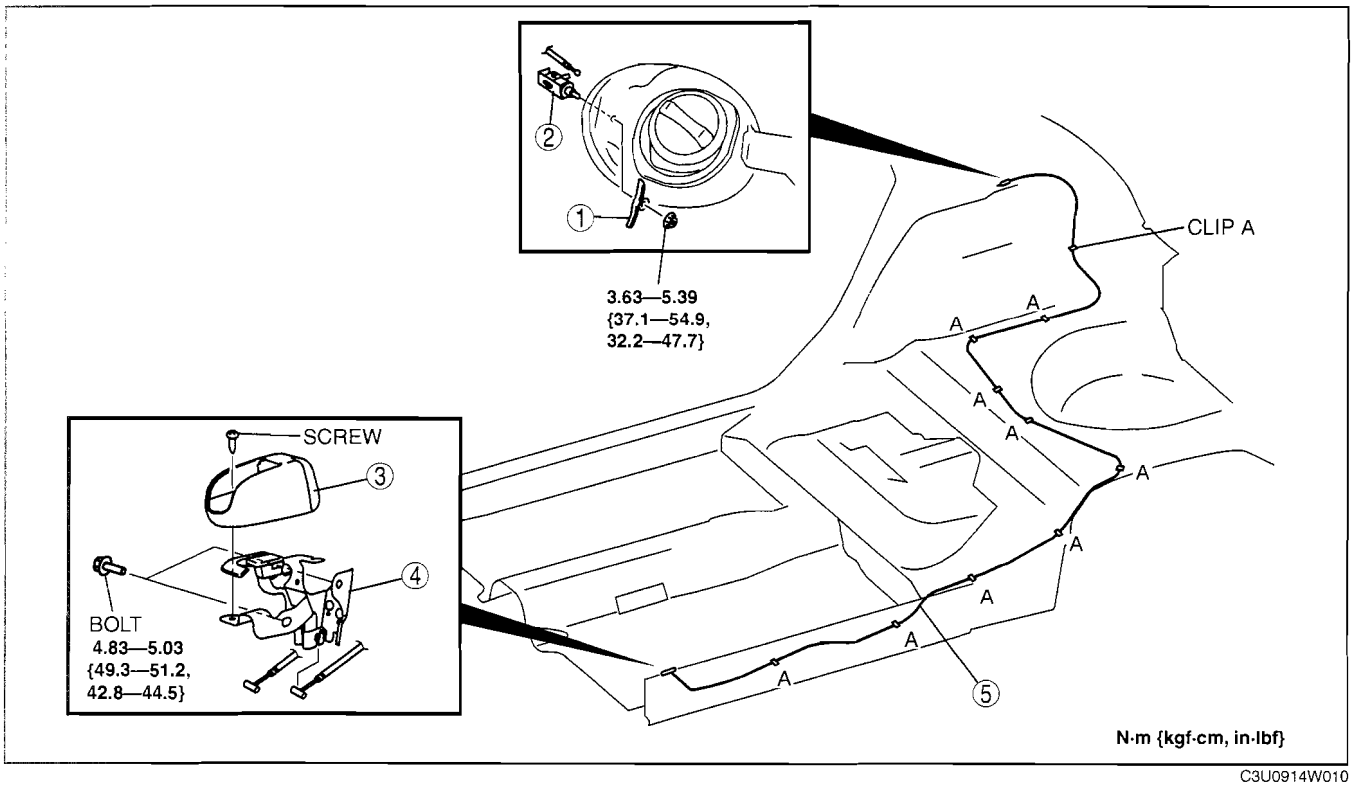
id091400804700

1. To remove the fuel-filler lid opener, remove the following procedure:
   - 5 door
     - — Remove the hole cover on the trunk side trim. (RH)
   - 4 door
     - — Remove the trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
     - — Slightly bend back the trunk side trim. (RH) (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
2. To remove the fuel-filler lid opener lever, remove the following part:.
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)



B3E0914W046

3. When removing the fuel-filler lid opener cable, perform the following procedure:
   (1) Remove the following parts:
      1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
      2) Rear scuff plate (Driver's side) (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
      3) Tire house trim (Driver's side) (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
      4) B-pillar lower trim (Driver's side) (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (2) Partially peel back the floor covering so that the fuel-filler lid opener cable can be removed.
   (3) Remove the fuel-filler lid opener cable from clips A.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



C3U0914W010

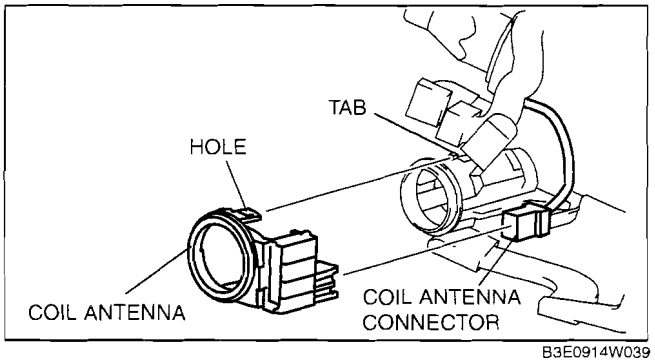
1	Lift spring
2	Fuel-filler lid opener
3	Opener lever cover
4	Fuel-filler lid opener lever and trunk lid opener lever
5	Fuel-filler lid opener cable

COIL ANTENNA REMOVAL/INSTALLATION

id091400804900

Note
- Do not remove the coil antenna unless you are replacing it.

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Hood release lever (See09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (2) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Disconnect the coil antenna connector.
4. Detach the steering lock tabs from the holes on the coil antenna.
5. Install in the reverse order of removal.



B3E0914W039

IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING

id091400805000

Foreword

- When performing the following procedures, the immobilizer resetting procedure using the M-MDS must also always be performed: "instrument cluster replacement", "PCM replacement", "instrument cluster and PCM joint replacement", "Key ID number clearing". The engine will not start unless all work is performed using the M-MDS.
- There are two methods for registering an additional key: Using the M-MDS and using two keys that are able to start the engine.
- When replacing any of the immobilizer system component parts, adding/erasing keys or performing other functions, refer to the following table and perform the applicable procedure (No.1 to 5).

Reference number	Situation	Required items	Cautionary notes
1	Making a spare key when the customer has two or more keys that can start the engine. Or registering an additional key.	• Registration key	• If the additional key registration method has been changed to "Customer spare key programming disabled" (inhibiting the method that uses two keys that are able to start the engine), the M-MDS is required when registering the additional key. In that case, perform procedure No.2.
2	Making a spare key when the customer has one key that can start the engine or no keys. Or registering an additional key.	• Registration key • M-MDS	-
3	Clearing previously registered key ID numbers.	• Registration keys (two or more) • M-MDS	• All the key ID numbers registered in the vehicle will be cleared. • Unless keys are re-registered after clearing the key ID numbers, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
3	Replace all the keys. (Key cylinder replacement)	• Registration keys (two or more) • M-MDS	• When replacing the key cylinder, have two or more keys ready for registration before beginning the procedure, since the previous keys will be invalid.
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is disabled.)	• M-MDS	• After performing this procedure it is not possible to register additional keys according to procedure No.1. The system can be returned to the original setting. The M-MDS must always be used to change the system setting.
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is enabled.)	• M-MDS	• This is the default setting on new vehicles.
5	Replacing the instrument cluster.	• Replacement instrument cluster • Registration keys (two or more) • M-MDS	• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
5	Replacing the PCM.	• Replacement PCM • M-MDS	-

Reference number	Situation	Required items	Cautionary notes
5	Replacing the PCM and instrument cluster.	• Replacement PCM • Replacement instrument cluster • Registration keys (two or more) • M-MDS	• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle. • Unless two or more keys are registered after replacement, the engine cannot be started. • The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.
	Replacing the coil antenna.	• New coil antenna	• It is not necessary to reset the immobilizer system.

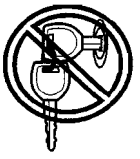
Caution

- **If any of the following items are touching or near the key head, signal communication between the key and vehicle is negatively affected, resulting in the engine not starting or the key registration failure. Do not perform the procedure if any of the following items are touching or near the key head.**
  - **— Any metallic object**
  - **— Spare keys or keys for other vehicles equipped with an immobilizer system**
  - **— Any electronic device, or any credit or other cards with magnetic strips**

EXAMPLES:

METAL RING LYING ON KEY HEAD

METAL PART OF ANOTHER KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

am3uuw0000082

Note

- Within the following procedures, the term a "valid key" means a "key that can start the engine".
- After adding/registering keys, clearing ID numbers or replacing any component part of the immobilizer system, verify that all keys can start the engine **within 5 s**.
- When verifying that the keys can start the engine, wait at least **5 s or more** between inserting them.
- If the engine cannot be started using a registered key, repeat the procedure from the beginning.
- Do not start the engine until the key registration procedure for all the necessary keys is completed. If the engine is started during the registration procedure, registration is stopped at that point. Repeat the procedure starting from the beginning if the engine is started before completion.
- Two or more key ID numbers must be registered for the engine to start.
- A maximum of eight key ID numbers can be registered for one vehicle. The M-MDS can be used to verify the number of key ID numbers registered to a single vehicle.
- Do not select screen menus of the M-MDS that are not indicated within the procedures.

No.1 Additional Key Registration Procedure (Using Two Valid Keys)

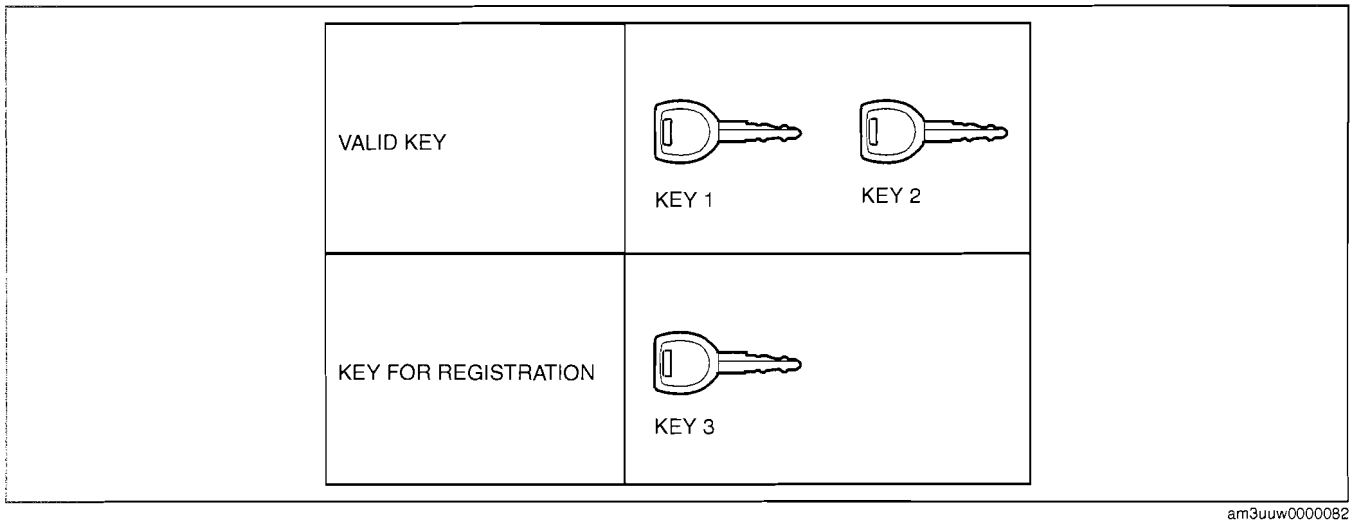
Conditions

- Customer has two or more valid keys.

Note

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "09-14-20 No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)".

Procedure



am3uuw0000082

1. Have one key (key 3) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.
3. Verify that the security light illuminates for **approx. 3 s** and then goes out.
4. Using key 1, turn the ignition switch to the LOCK position **within approx. 4 s** after the security light goes out.
5. Remove key 1
6. Repeat Steps 2—5 using key 2.
7. Repeat Steps 2—5 using key 3.
8. If additional keys need to be registered, repeat Steps 1—7 in the same manner as key 3.

No.2 Additional Key Registration Procedure (Using the M-MDS)

Conditions

- Customer has only one valid key. Or customer has no valid keys. (Can also be performed even if there are two or more valid keys)

Note

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "09-14-20 No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)".

Procedure

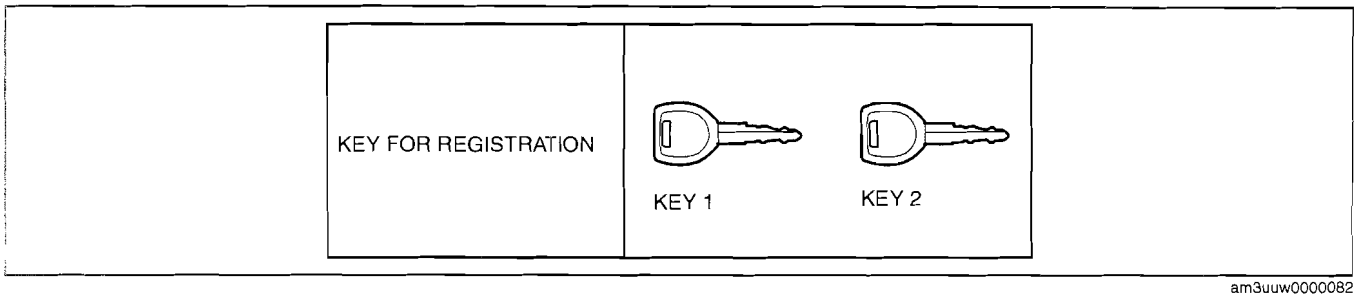
1. Have one key (key 1) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.

Note

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Program Additional Ignition Key" from the M-MDS screen menu.

No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration) Procedure



am3uuw0000082

1. Have two or more keys (key 1, key 2) ready for registration after the clearing the key ID numbers.
2. Using key 1, turn the ignition switch to the ON position.

Note
- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Ignition key ID number Erase" from the M-MDS screen menu and perform the tasks according to the M-MDS screen.

No.4 Changing the Method for Registering Additional Keys

Note
- This procedure is for changing the enable/disable setting of the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)".
- The default setting for new vehicles and new instrument cluster replacement is "Enabled".
- By disabling the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)", only the M-MDS can be used to register additional keys, thereby preventing two valid keys from being used to create an unauthorized spare key. This function is for use by rental car or other companies with vehicle fleets.

Procedure

1. Using any key, turn the ignition switch to the ON position. (Either a valid or an unregistered key can be used.)

Note
- When using an unregistered key, although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

2. Connect the M-MDS to the DLC-2.
3. Select "Body/Security/PATS function" from the M-MDS screen menu.
4. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
5. Select either "Customer Spare Key Programming Enable" or "Customer Spare Key Programming Disable" from the M-MDS screen menu. Depending on the selected menu, the additional key registration method is as shown below:

Setting	Additional key registration method	
	Procedure using two valid keys	Procedure using the M-MDS
Customer spare key programming enable	x	x
Customer spare key programming disable	-	x

x : Procedure is possible
- : Procedure is not possible

6. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit" to complete the M-MDS function.
7. After Step 6, wait **10 s or more** and then turn the ignition switch to the LOCK position.

No.5 Resetting Procedure for the Immobilizer System when Replacing the PCM or Instrument Cluster

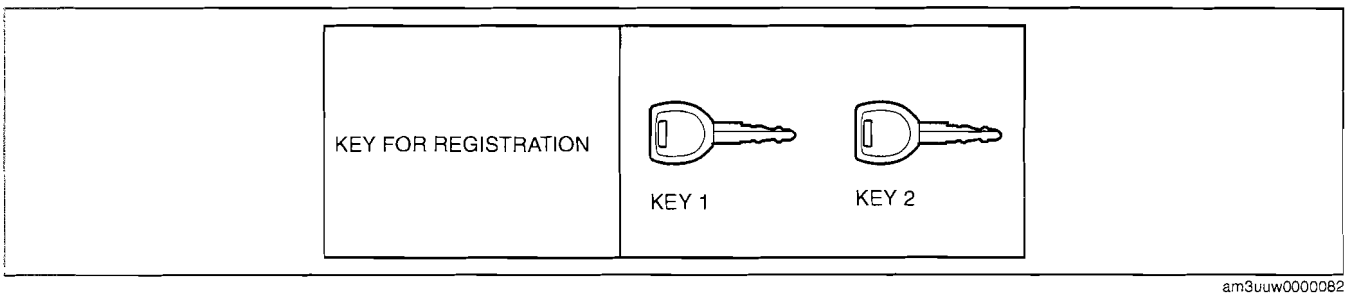
Conditions

- When replacing only the PCM: No conditions.
- When replacing only the instrument cluster: Customer has two or more valid keys after replacement tasks.
- When replacing the PCM and the instrument cluster: Customer has two or more valid keys after replacement.

Caution

- **When replacing the PCM and the instrument cluster at the same time, follow the same instructions described in the procedure for "when replacing the instrument cluster".**
- **When replacing only the PCM, start from Step 2. Also, when key 1 is indicated within the procedure, any valid key can be used.**
- **Before starting Step 1, complete the procedure for PCM and instrument cluster replacement.**

Procedure



am3uuw0000082

1. Have two or more keys (key 1, key 2) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.

Note

- When replacing only the PCM: The security light illuminates **for 3 s** and then goes out.
- When replacing the instrument cluster: Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

3. Connect the M-MDS to the DLC-2.
4. Select "Body/Security/PATS function" from the M-MDS screen menu.
5. Perform security access as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
6. Select "Parameter Reset" from the M-MDS screen menu.
7. Perform security access again as indicated on the M-MDS screen. (See 09-14-21 No.6 Security Access Procedure.)
8. Select the replaced part as indicated on the M-MDS screen.
   - When replacing only the PCM: Select "PCM".
   - When replacing only the instrument cluster: Select "HEC".

Note

- At this time, do not select any other parts from the M-MDS screen menu.

9. Perform the tasks according to the M-MDS screen.

No.6 Security Access Procedure

Note

- Security access must be performed when performing the following functions: "Program Additional Ignition Key", "Ignition Key ID Number Erase", "Customer Spare Key Programming Enable/Disable" and "Parameter Reset".

Procedure

1. Connect the M-MDS to the DLC-2.
2. Select "Body/Security/PATS function" from the M-MDS screen menu.
3. Security access is started and the M-MDS displays "Outcode".

Caution

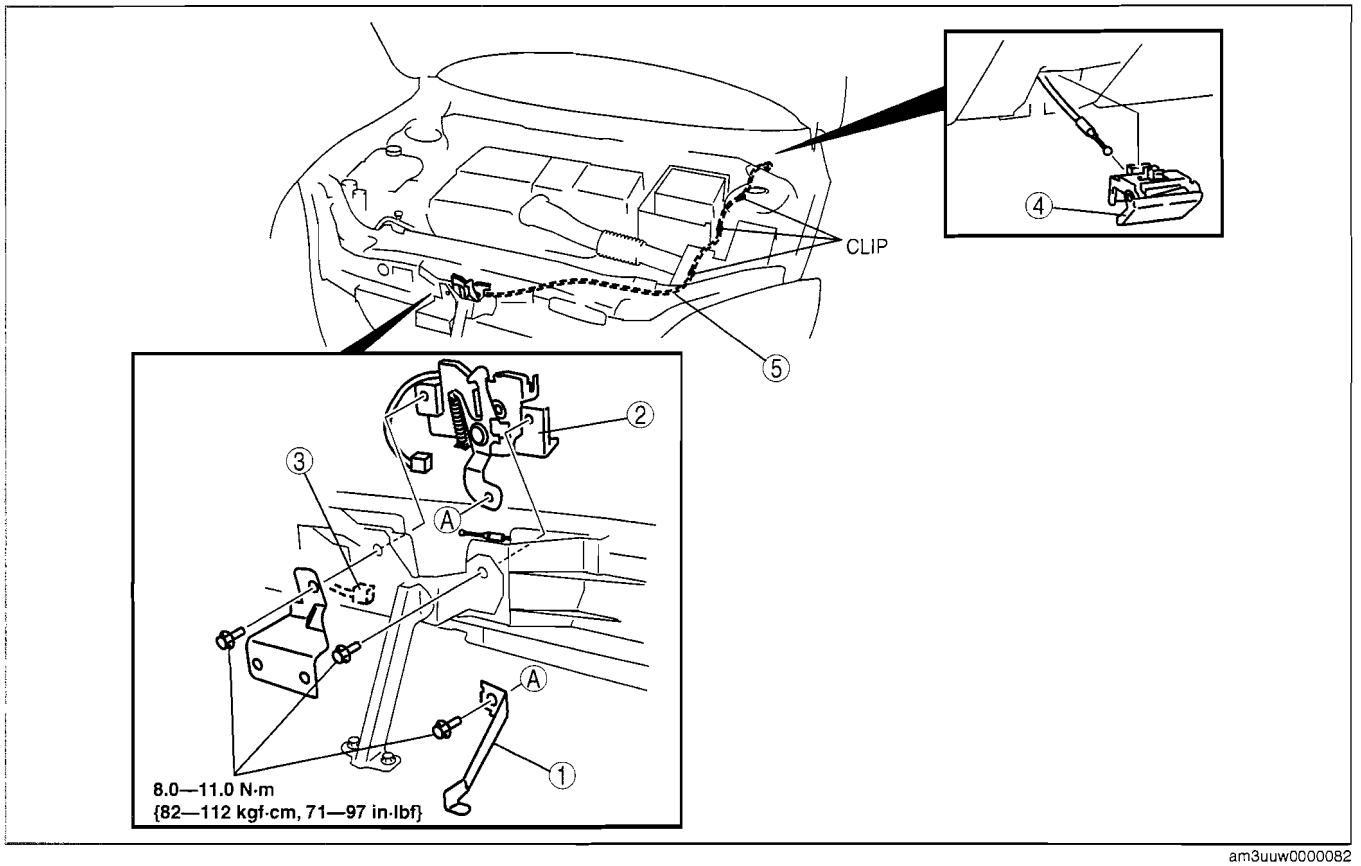
- **After reading out the outcode, do not turn ignition switch from LOCK to ON position 5 times, otherwise the outcode value will be changed.**

4. Input the corresponding "Incode" for the "Outcode" displayed on the M-MDS screen.
5. After successfully performing security access, "Program Additional Ignition Key", "Ignition key ID number Erase" or "Customer Spare Key Programming Enable/Disable" is displayed on the M-MDS screen. When performing "Parameter Reset", security access is requested two times and after successfully performing it the second time, "Replacement Module" is displayed.

HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION

id091400805300

1. To remove the hood release cable, remove the following parts:
   (1) Battery (See 01-17A-2 BATTERY REMOVAL/INSTALLATION[LF, L3].)
   (2) Fresh-air duct (See 01-13A-4 INTAKE AIR SYSTEM REMOVAL/INSTALLATION[LF, L3].)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the hood. (See 09-10-4 HOOD ADJUSTMENT.)



am3uuw0000082

1	Lever (5 door)
2	Hood latch
3	Hood latch switch connector

4	Hood release lever (See 09-14-22 Hood Release Lever Removal Note.)
5	Hood release cable

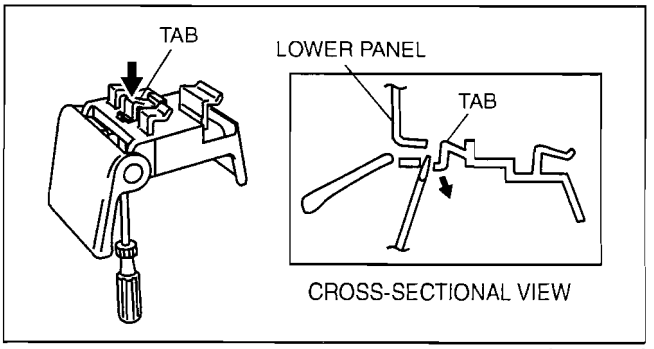
Hood Release Lever Removal Note

1. Pull the lever.
2. While pushing the tab in the direction of the arrow using a tape-wrapped, small flathead screwdriver, detach it from the lower panel.

Caution

- **Be careful not to damage the hood release cable when removing the hood release lever with the flathead screwdriver.**

3. Under the condition in Step 2, pull the hood release lever outward, then remove it from the lower panel.

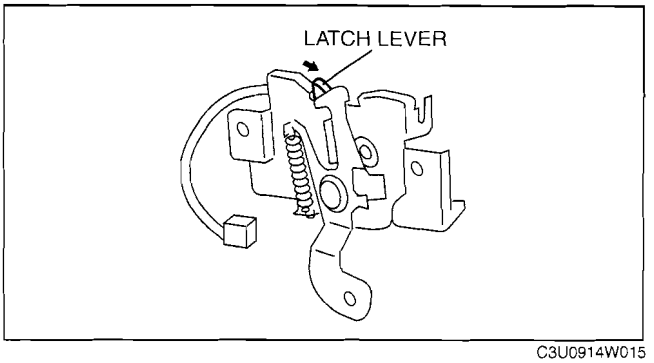


am3uuw0000083

HOOD LATCH SWITCH INSPECTION

id091400805400

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



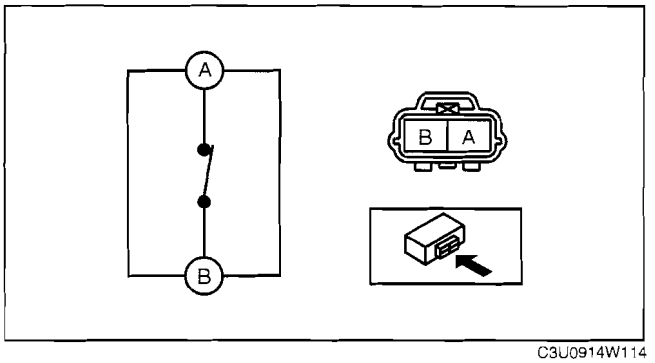
C3U0914W015

2. Inspect for continuity between the hood latch switch terminals.
   - If not as specified, replace the hood latch.

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (hood is closed)		
Unlatch (hood is open)	O	O

C3U0914W123

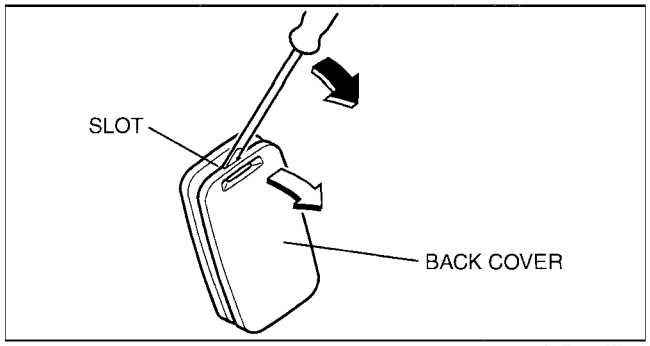


C3U0914W114

TRANSMITTER BATTERY REPLACEMENT

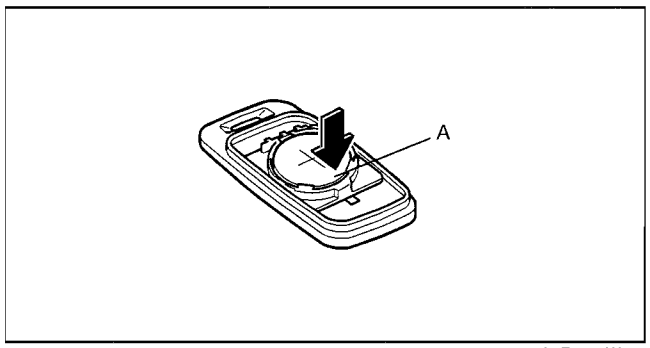
id091400805700

1. Insert a small flathead screwdriver into the slot and gently pry open the transmitter.



A6E7718W001

2. Press the portion of the battery indicated by A and remove the battery.
3. Install a new battery (CR2025) into the front portion of the holder with the positive pole (+) facing up. Press on the B portion of the battery to set the battery.

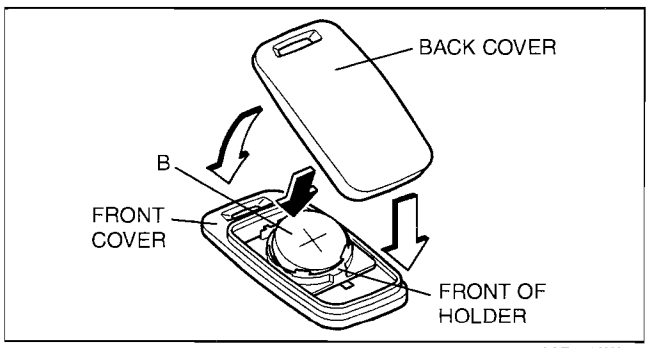


A6E7718W002

4. Align the front and back covers and snap the transmitter shut.

Battery specification
Lithium CR2025 × 1

Note
- The batteries will last about **2 years** when used **10 times** a day.



A6E7718W003

TRANSMITTER BATTERY INSPECTION

id091400805800

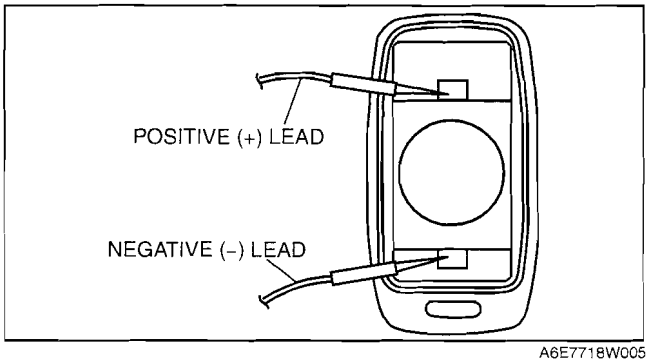
Caution

- **Since the battery voltage does not drop fully if the button is pushed for only 4 s or less, sufficient battery voltage cannot be determined. Always push the button for 5 s.**

Note

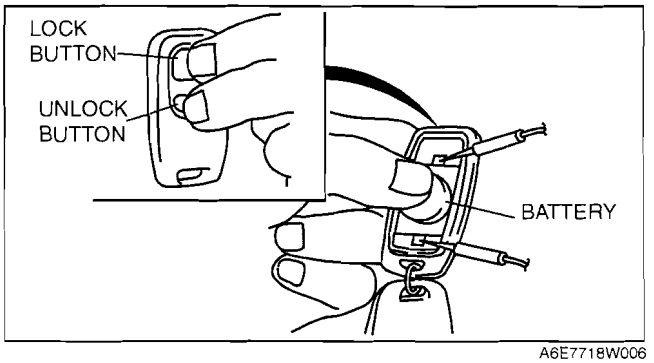
- A correct measurement cannot be obtained if the battery temperature is low. Make sure the battery is at **18 °C {64 °F} or more** for **at least 30 min** before reinspecting if a measurement value is under the standard voltage.

1. Remove the transmitter cover.
2. Apply the ohmmeter leads to the positions as indicated in the figure.



A6E7718W005

3. While pressing the battery as shown in the figure, press the LOCK and UNLOCK buttons on the transmitter at the same time to start measurement of the voltage.
4. Release the buttons after **5 s**.
5. Verify that the minimum voltage is the standard voltage or more for **10 s** after starting measurement.
   - If the voltage is under the standard voltage, replace the battery.



A6E7718W006

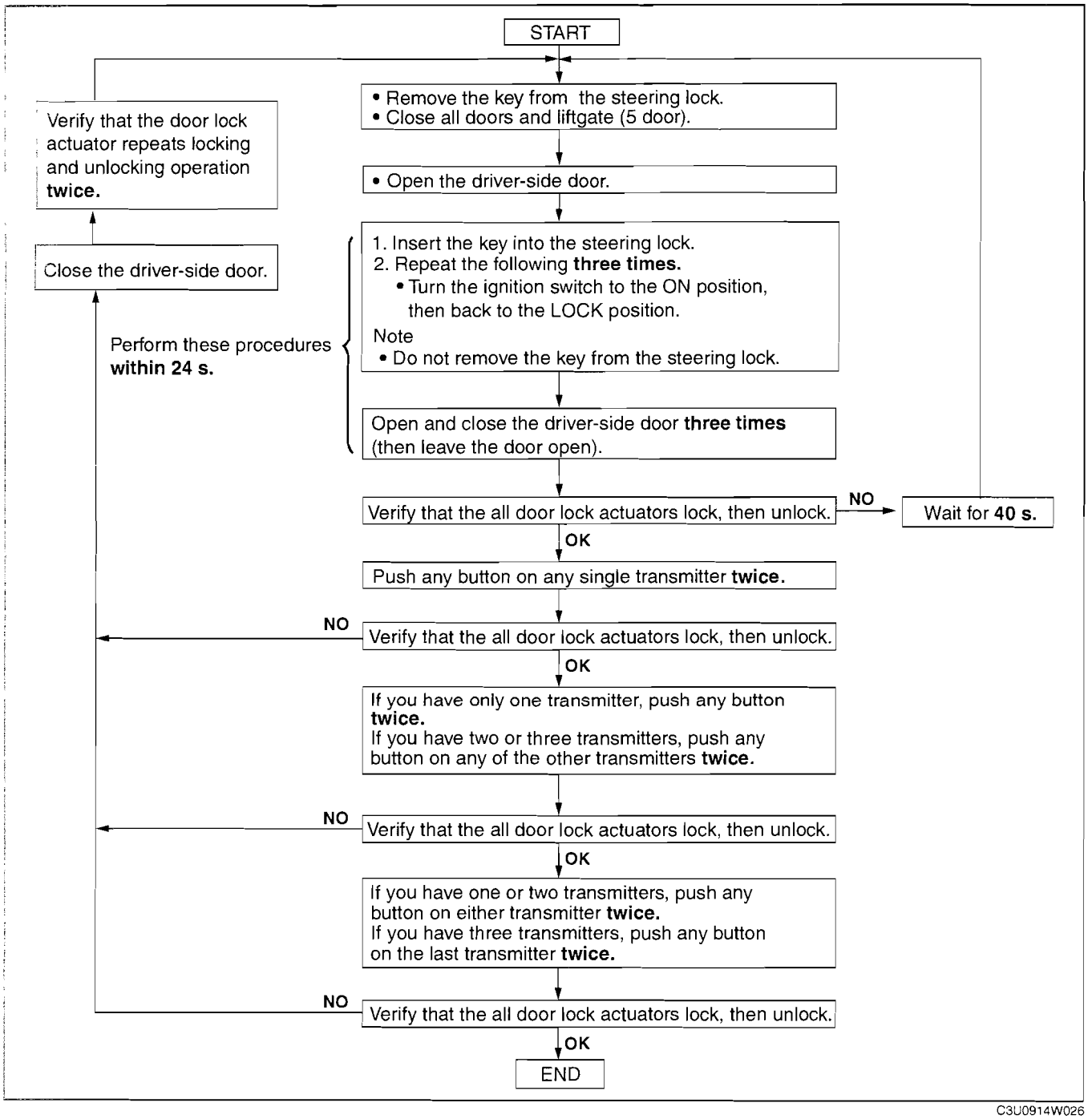
Standard voltage
2.7 V

TRANSMITTER ID CODE REGISTRATION

id091400805900

Note

- When registering the ID code into a keyless control module, verify that other transmitters are not being operated in the vicinity.
- After ID code registering, remove the key from the steering lock and verify that all doors lock/unlock normally using the transmitter.

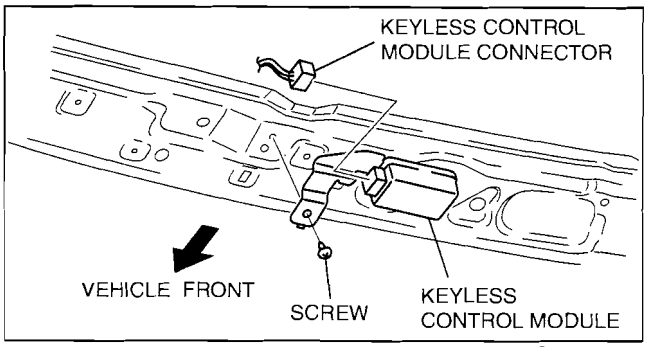


C3U0914W026

KEYLESS CONTROL MODULE REMOVAL/INSTALLATION

id091400806300

1. Disconnect the negative battery cable.
2. Remove the map light. (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
3. Disconnect the keyless control module connector.
4. Remove the screw, then remove the keyless control module.
5. Install in the reverse order of removal.
6. When replacing the keyless control module, register the transmitter ID codes. (See 09-14-26 TRANSMITTER ID CODE REGISTRATION.)



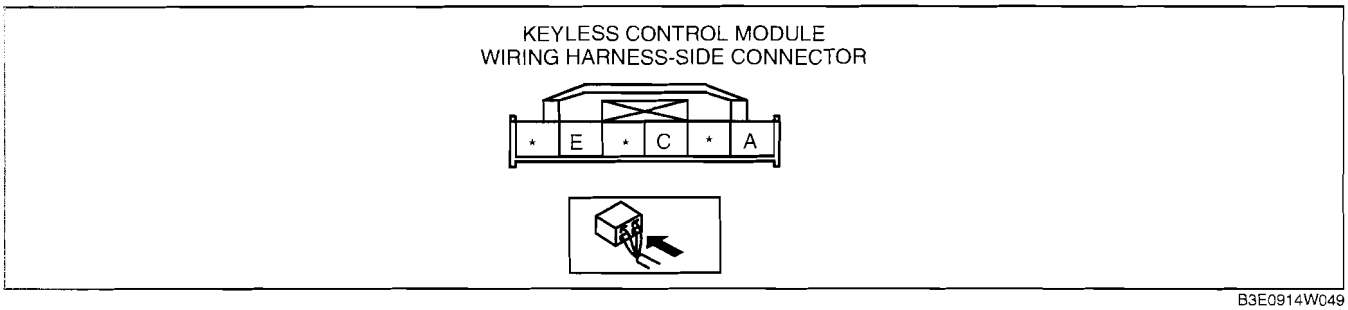
C3U0914W013

KEYLESS CONTROL MODULE INSPECTION

id091400806400

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).
   - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.
2. If the system does not work properly even though the inspection items or related wiring harnesses do not have any malfunction, perform symptom troubleshooting [KEYLESS ENTRY SYSTEM].

Terminal Voltage Table (Reference)



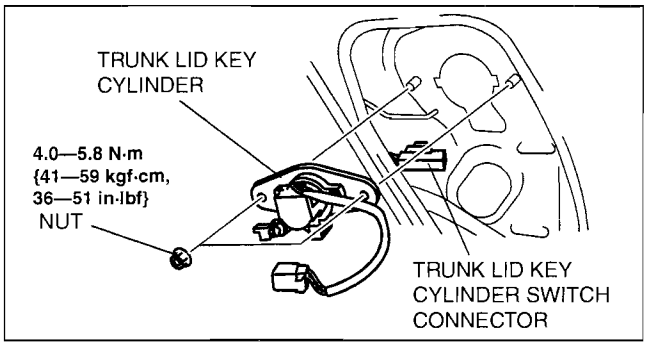
B3E0914W049

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/ Continuity	Inspection item(s)
A	Power supply	PJB	Under any condition	B+	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • Related wiring harnesses
C	Data	PJB	Under any condition: Inspect the wiring harness between the keyless control module and PJB terminal J-04 F for continuity.	Continuity detected	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • transmitter (See 09-14-25 TRANSMITTER BATTERY INSPECTION.) • Related wiring harnesses
E	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND

TRUNK LID KEY CYLINDER REMOVAL/INSTALLATION

id091400810900

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Detach the rod from the trunk lid key cylinder.
4. Disconnect the trunk lid key cylinder connector.
5. Remove the nuts, then remove the trunk lid key cylinder.
6. Install in the reverse order of removal.



B3E0914W007

TRUNK LID KEY CYLINDER SWITCH INSPECTION

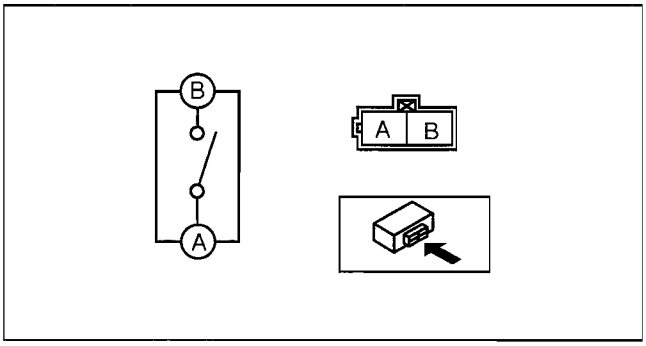
id091400811000

1. Inspect for continuity between the trunk lid key cylinder push switch terminals.
   - If not as specified, replace the trunk lid key cylinder.

O—O : Continuity

Operation	Terminal	
	A	B
On (Unlock)	O	O
Off		

c3u0914w017

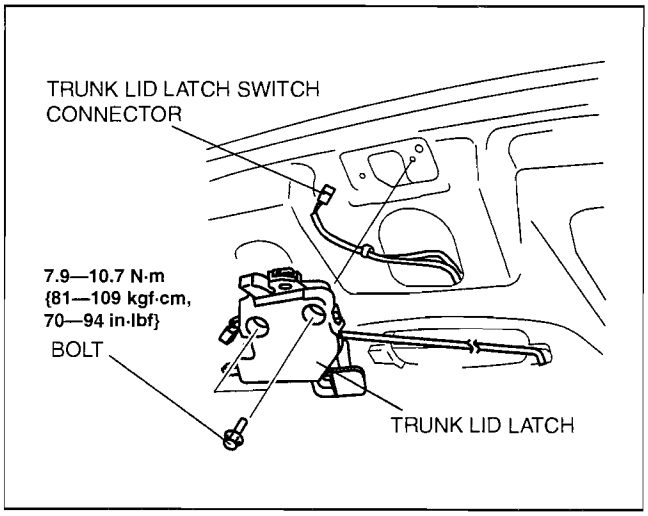


c3u0914w016

TRUNK LID LATCH REMOVAL/INSTALLATION

id091400817100

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Detach the rod from the trunk lid key cylinder.
4. Disconnect the trunk lid latch switch connector.
5. Remove the bolts, then remove the trunk lid latch and opener.
6. Install in the reverse order of removal.
7. Adjust the trunk lid. (See 09-10-7 TRUNK LID ADJUSTMENT.)

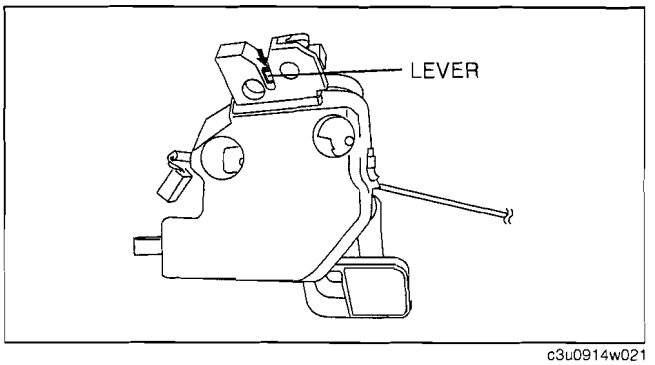


c3u0914w020

TRUNK LID LATCH SWITCH INSPECTION

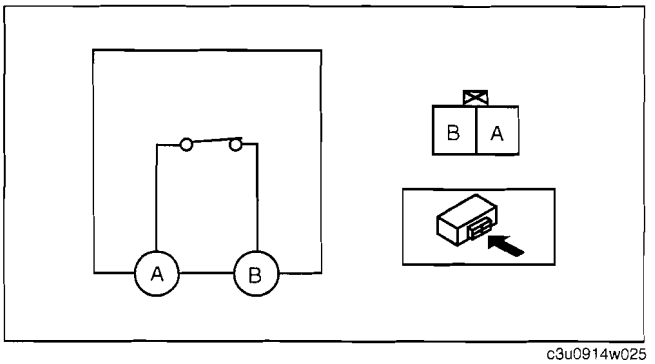
id091400811200

1. When inspecting the latch, press the latch lever using a flathead screwdriver or a similar tool.



c3u0914w021

2. Inspect for continuity between the trunk lid latch switch terminals.
   - If not as specified, replace the trunk lid latch and lock actuator.



c3u0914w025

O—O : Continuity

Latch condition	Terminal	
	A	B
Latch (trunk lid is closed)		
Unlatch (trunk lid is open)	O	O

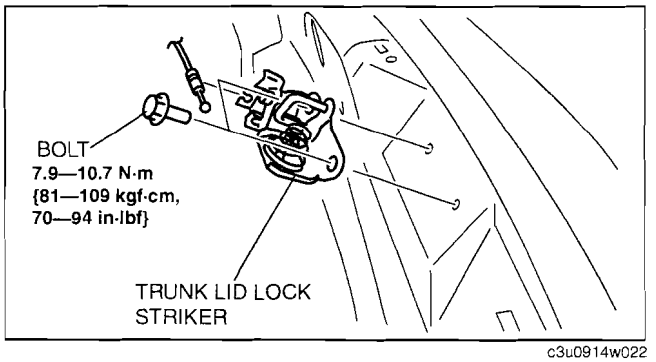
B3E0914W019

09-14

TRUNK LID LOCK STRIKER REMOVAL/INSTALLATION

id091400811300

1. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
2. Detach the trunk lid opener cable.
3. Remove the bolts, then remove the trunk lid striker.
4. Install in the reverse order of removal.
5. Adjust the trunk lid. (See 09-10-7 TRUNK LID ADJUSTMENT.)

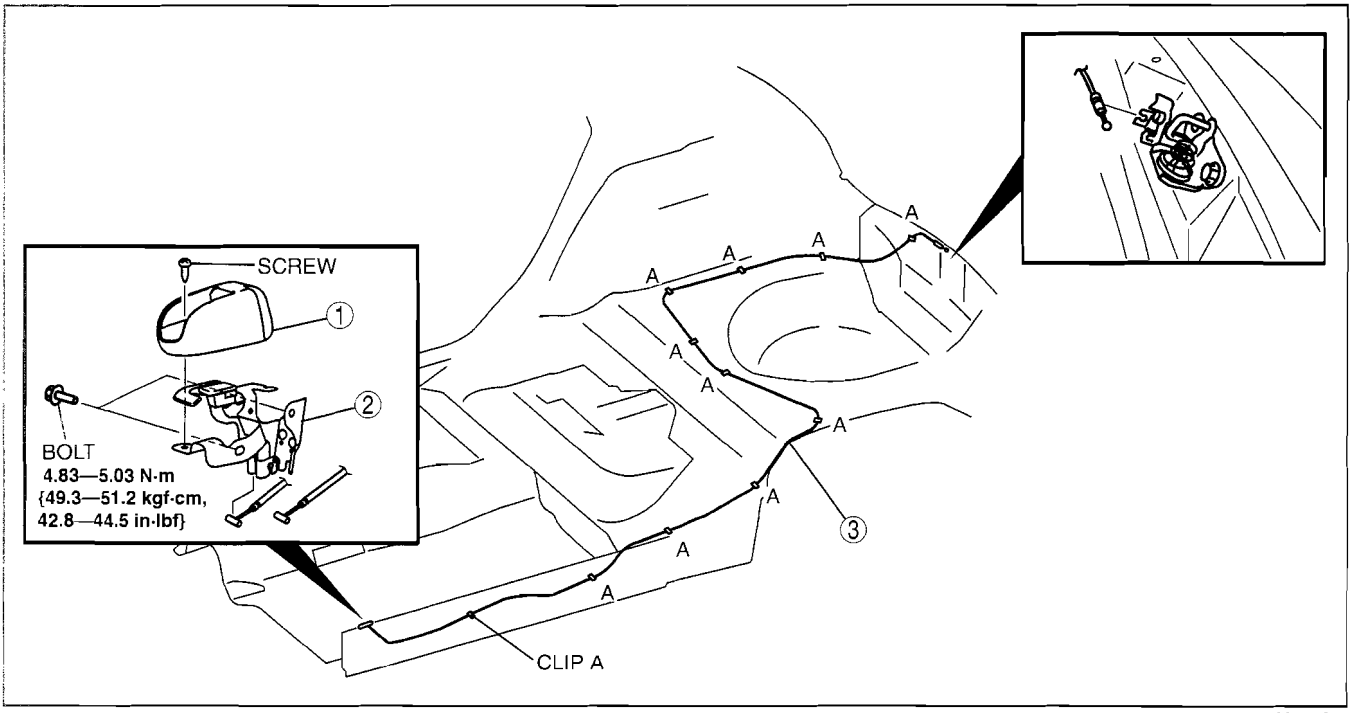


c3u0914w022

TRUNK LID OPENER REMOVAL/INSTALLATION

id091400812100

1. To remove the trunk lid opener lever, remove the following part:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
2. When removing the trunk lid opener cable, perform the following procedure:
   (1) Remove the following parts:
      1) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
      2) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
      3) Rear scuff plate (Driver's side) (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
      4) Tire house trim (Driver's side) (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
      5) B-pillar lower trim (Driver's side) (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (2) Partially peel back the floor covering so that the trunk lid opener cable can be removed.
   (3) Remove the trunk lid opener cable from the trunk lid lock striker.
   (4) Remove the trunk lid opener cable from the clips A.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



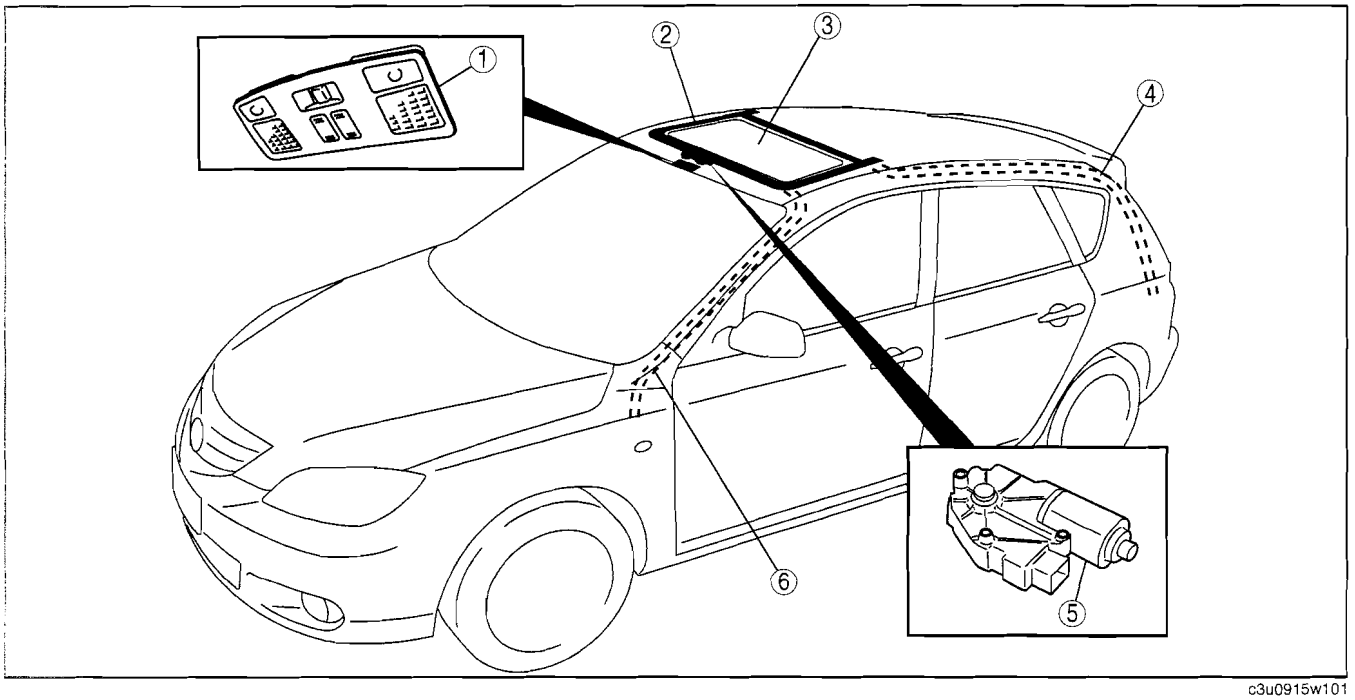
c3u0914w014

1	Opener lever cover
2	Fuel-filler lid opener lever and trunk lid opener lever
3	Trunk lid opener lever cable

09-15 SUNROOF

SUNROOF LOCATION INDEX

id091500800100



c3u0915w101

1	Sunroof switch (See 09-15-2 SUNROOF SWITCH REMOVAL/INSTALLATION.) (See 09-15-2 SUNROOF SWITCH INSPECTION.)
2	Sunroof unit (See 09-15-3 SUNROOF UNIT REMOVAL/INSTALLATION.) (See 09-15-4 SUNROOF UNIT DISASSEMBLY/ASSEMBLY.)
3	Glass panel (See 09-15-2 GLASS PANEL REMOVAL/INSTALLATION.) (See 09-15-3 GLASS PANEL ADJUSTMENT.)

4	Rear drain hose (See 09-15-9 REAR DRAIN HOSE REMOVAL.) (See 09-15-10 REAR DRAIN HOSE INSTALLATION.)
5	Sunroof motor (See 09-15-6 SUNROOF MOTOR REMOVAL/INSTALLATION.) (See 09-15-7 SUNROOF MOTOR INSPECTION.)
6	Front drain hose (See 09-15-8 FRONT DRAIN HOSE REMOVAL.) (See 09-15-8 FRONT DRAIN HOSE INSTALLATION.)

SUNROOF SWITCH REMOVAL/INSTALLATION

id091500800200

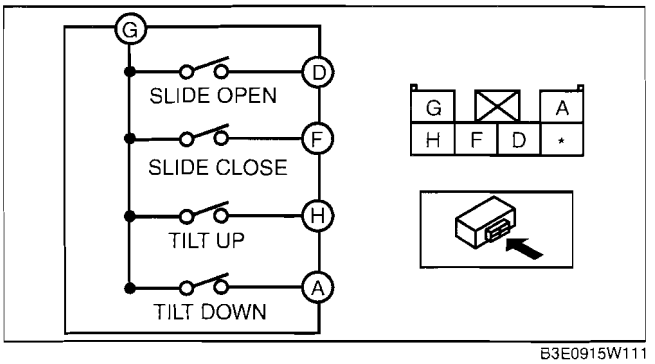
Note
- The sunroof switch and the map light are a single unit.

1. Disconnect the negative battery cable.
2. Remove the map light from the headliner. (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
3. Install in the reverse order of removal.

SUNROOF SWITCH INSPECTION

id091500800300

1. Verify that the continuity between the sunroof switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the sunroof switch.



B3E0915W111

○—○ : Continuity

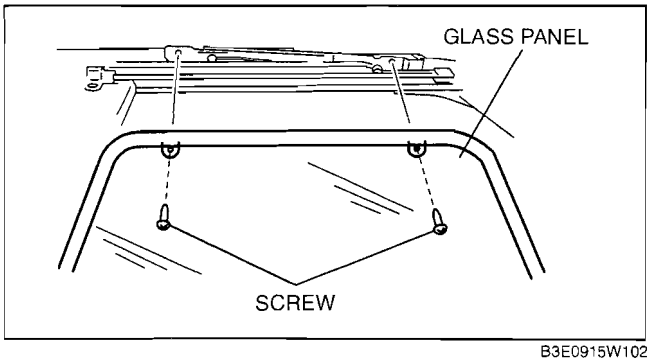
Switch position	Terminal				
	A	D	F	H	G
Slide open		○			○
Slide close			○		○
Tilt up				○	○
Tilt down	○				○
OFF					

B3E0915W112

GLASS PANEL REMOVAL/INSTALLATION

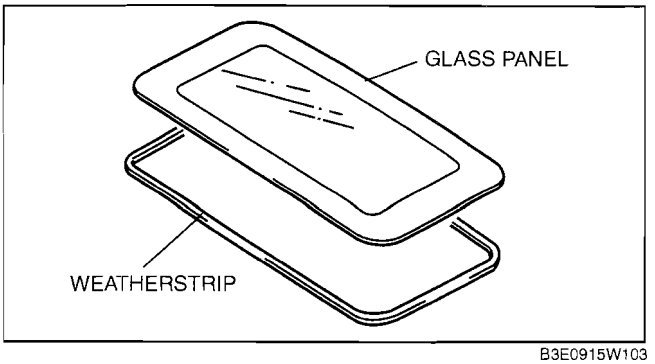
id091500800500

1. Fully close the glass panel.
2. Fully open the sunshade.
3. Remove the screws, then remove the glass panel.



B3E0915W102

4. Remove the weatherstrip from the glass panel.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See 09-15-3 GLASS PANEL ADJUSTMENT.)



B3E0915W103

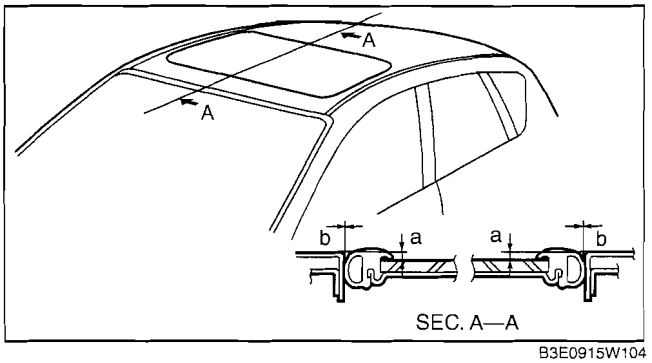
GLASS PANEL ADJUSTMENT

id091500800600

1. Fully close the glass panel.
2. Measure the gap and height difference between the glass panel and the body.
3. Loosen the glass panel installation screws and move the glass panel to adjust.

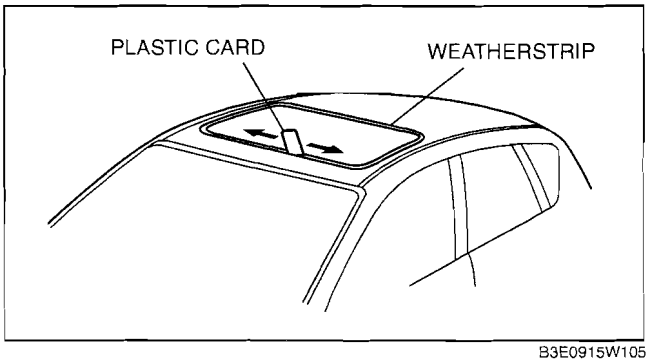
   Standard clearance
   a: 0.2—2.2 mm {0.008—0.08 in}
   b: 0 mm {0 in}

4. Tighten the screws.



B3E0915W104

5. Insert any available thin plastic card between the weatherstrip and the body, and verify that they are sealed. (There is resistance when the plastic card is moved.)
   - If they are not sealed, perform Steps 3—4 and adjust again.

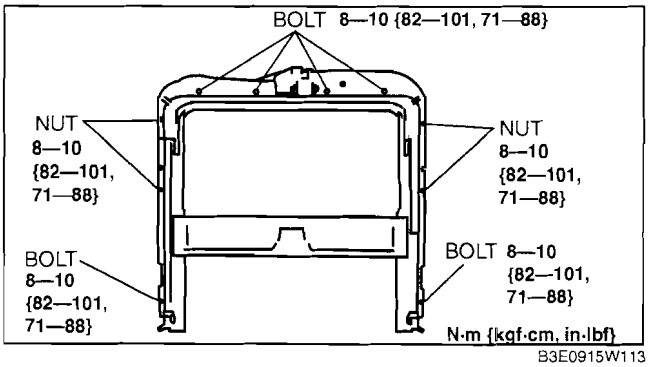


B3E0915W105

SUNROOF UNIT REMOVAL/INSTALLATION

id091500800700

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (16)Head impact pad (See 09-17-16 HEAD IMPACT PAD REMOVAL/INSTALLATION.)
   (17)Glass panel (See 09-15-2 GLASS PANEL REMOVAL/INSTALLATION.)
3. Disconnect the front and rear drain hoses from the sunroof frame.
4. Remove the bolts and nuts, then remove the sunroof unit.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See 09-15-3 GLASS PANEL ADJUSTMENT.)

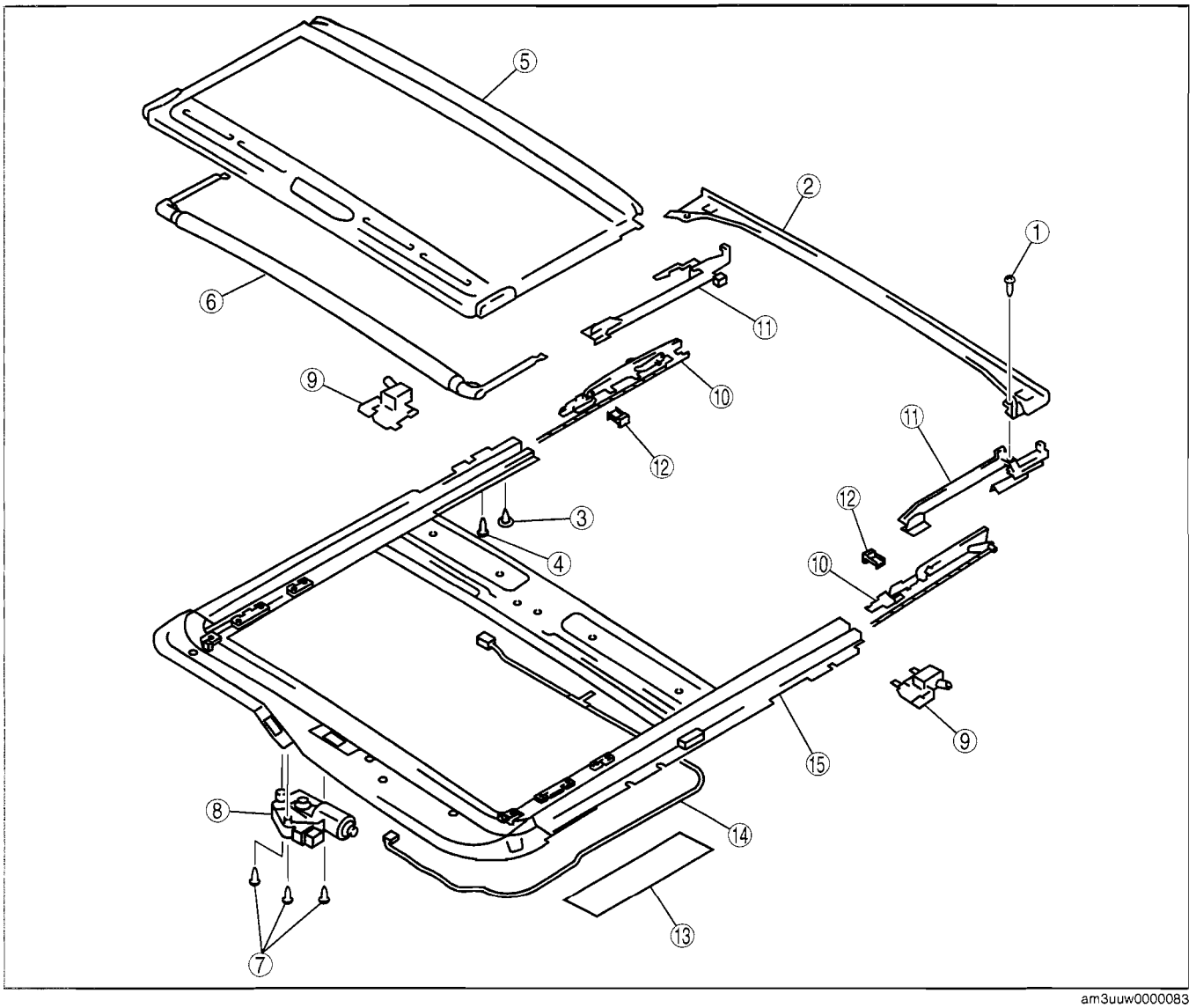


B3E0915W113

SUNROOF UNIT DISASSEMBLY/ASSEMBLY

id091500800800

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



am3uuw0000083

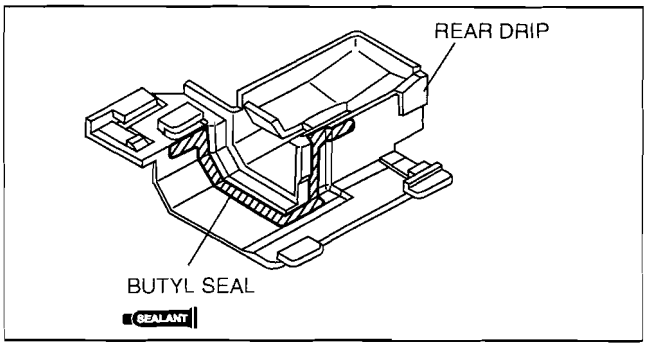
1	Screw A
2	Drip rail
3	Sunshade stopper
4	Screw B
5	Sunshade
6	Deflector
7	Screw C
8	Sunroof motor (See 09-15-5 Sunroof Motor Assembly Note.)

9	Rear drip (See 09-15-5 Rear Drip Assembly Note.)
10	Guide
11	Decoration link
12	Front drip
13	Tape protector
14	Short cord
15	Frame

Rear Drip Assembly Note

Note
- If the rear drip is removed, butyl seal must be applied when re-installing.

1. Apply a **6.0—8.0 mm {0.24—0.31 in}** wide line of butyl seal to the area shown in the figure.



am3uuw0000083

Sunroof Motor Assembly Note

Note
- If the guide is removed, initial position setting of the sunroof motor will be required. After installing the sunroof unit, perform initial position setting using the following procedure.

1. Press the TILT UP switch to fully tilt up the glass panel.
2. When the glass panel reaches the fully tilt up position, temporarily release the TILT UP switch and press it again **for approx. 13 s** continuously. Continue pressing the switch until the glass panel automatically stops at the fully tilt up position after reaching the mechanical lock position.
3. When the glass panel stops at the fully tilt up position, temporarily release the TILT UP switch, then press it again **within 5 s** and hold.

Note
- Press the TILT UP switch continuously until the glass panel opens to the fully open position, returns to the fully closed position and then stops.

4. Release the TILT UP switch when the glass panel stops at the fully closed position.

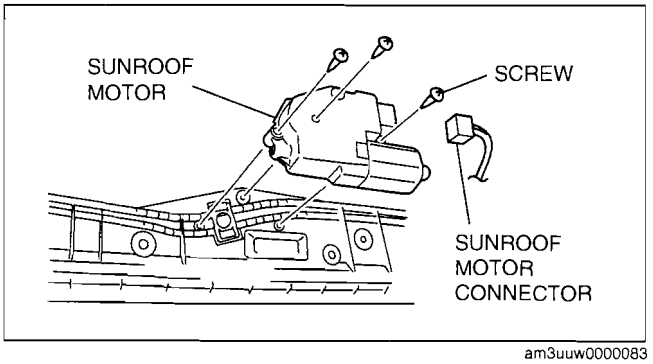
SUNROOF MOTOR REMOVAL/INSTALLATION

id091500805000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
3. Disconnect the sunroof motor connector.
4. Remove the screws, then remove the sunroof motor.
5. Install in the reverse order of removal.

Note

- If the glass panel or the sunroof motor is moved with the sunroof motor removed, initial position setting of the sunroof motor will be required. Perform initial position setting referring to the Sunroof Motor Assembly Note. (See 09-15-4 SUNROOF UNIT DISASSEMBLY/ASSEMBLY.)



am3uuw0000083

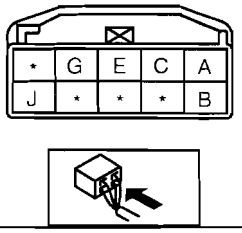
SUNROOF MOTOR INSPECTION

id091500801100

1. Measure the voltage at each terminal (other than terminal G).
   - If not as specified, inspect the parts listed under "Inspection item" and the related wiring harnesses.
2. Disconnect the negative battery cable.
3. Verify that continuity at terminal G is as indicated in the Terminal Voltage Table (Reference).
4. If the parts and wiring harnesses are normal but the system still does not work properly, replace the sunroof relay.

Terminal voltage table (Reference)

SUNROOF MOTOR WIRING HARNESS-SIDE CONNECTOR



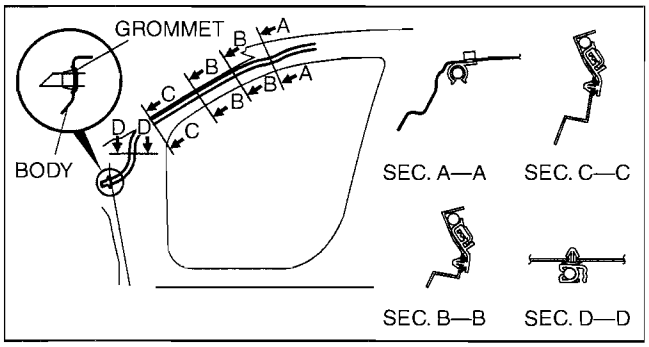
B3E0915W110

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Inspection item
A	Slide open	Sunroof switch	Sunroof is fully opening.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
B	Slide close/tilt down	Sunroof switch	Sunroof is closing/tilting down.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
C	Tilt up	Sunroof switch	Sunroof is tilting up.	B+	Sunroof switch (See09-15-2 SUNROOF SWITCH INSPECTION.)
			Other	0	
E	IG2	SUNROOF 15 A fuse	Turn the ignition switch to the ON position.	B+	SUNROOF 15 A fuse
G	GND	GND	Under any condition: Check for continuity to ground.	Continuity	GND
J	Power supply	SUNROOF 7.5 A fuse	Under any condition	B+	SUNROOF 7.5 A fuse

FRONT DRAIN HOSE REMOVAL

id091500801300

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (16)Front door (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (17)Dashboard (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
2. Disconnect the front drain hose from the sunroof frame.
3. Remove the front drain hose from the clips.
4. Pull the front drain hose into the vehicle interior and remove the front drain hose.



B3E0915W106

FRONT DRAIN HOSE INSTALLATION

id091500801400

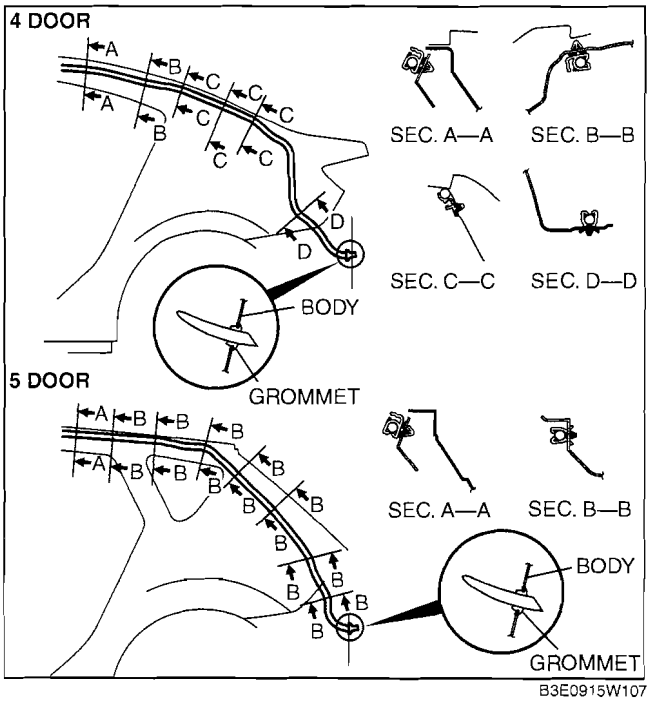
Caution
- **If the front drain hose is pinched or bent at any point, the water in the hose may not drain and could leak inside the vehicle. During and after installation of the trims and headliner, always make sure there is no interference with the front drain hose. Correct any abnormality if found.**

1. Apply soapy water to the part of the sunroof frame where the front drain hose is inserted.
2. Insert the front drain hose end into the sunroof frame.
3. Install the front drain hose to the clips parallel to the pillar and free of looseness.
4. Insert the front drain hose grommet into the hole of the inner hinge pillar.
5. Install the following parts:
   (1) Dashboard (See 09-17-4 DASHBOARD REMOVAL/INSTALLATION.)
   (2) Front door (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION.)
   (3) Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (4) Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (5) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (6) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (7) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (8) Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (11)B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (12)B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (13)Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (14)Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (15)Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (16)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (17)Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)

REAR DRAIN HOSE REMOVAL

id091500801500

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (11)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (12)Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (13)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (14)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (15)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (16)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (17)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
2. Remove the sunroof frame from the rear drain hose.
3. Remove the rear drain hose from the clips.
4. Pull the rear drain hose into the vehicle interior and remove the rear drain hose.



B3E0915W107

REAR DRAIN HOSE INSTALLATION

id091500801600

Caution

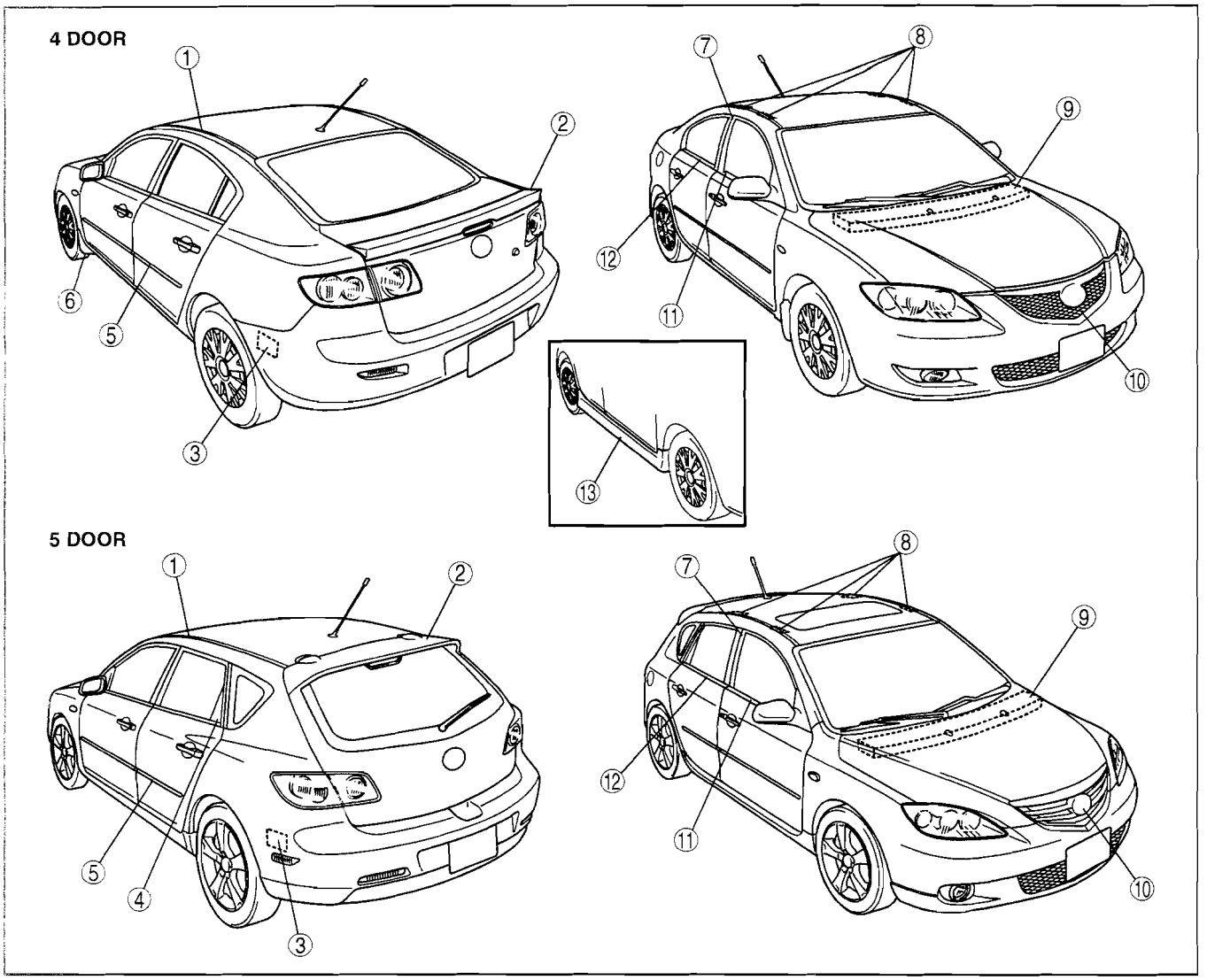
- **If the rear drain hose is pinched or bent at any point, the water in the hose may not drain and could leak inside the vehicle. During and after installation of the trims and headliner, always make sure there is no interference with the rear drain hose. Correct any abnormality if found.**

1. Apply soapy water to the part of the sunroof frame where the rear drain hose is inserted.
2. Insert the rear drain hose end into the sunroof frame.
3. Install the rear drain hose to the clips parallel to the pillar and free of looseness.
4. Insert the rear drain hose grommet into the hole of the inner rear pillar.
5. Install the following parts:
   (1) Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (2) Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (3) Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (4) Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (5) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (6) Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (7) Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (11)B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (12)B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (13)Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (14)Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (15)Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (16)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (17)Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)

09-16 EXTERIOR TRIM

EXTERIOR TRIM LOCATION INDEX

id091600800100



c3u0916w101

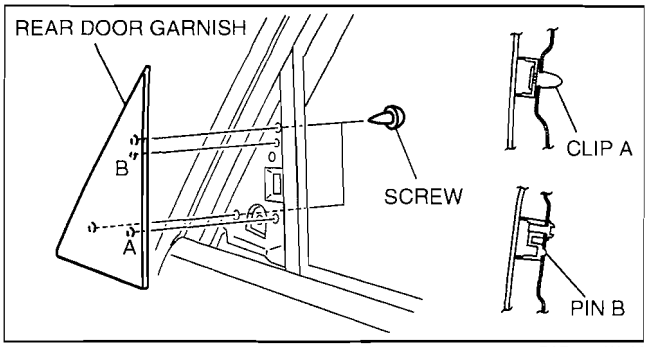
1	Roof molding (See 09-16-4 ROOF MOLDING REMOVAL.) (See 09-16-4 ROOF MOLDING INSTALLATION.)
2	Rear spoiler (See 09-16-9 REAR SPOILER REMOVAL/ INSTALLATION.)
3	Extractor chamber (See 09-16-8 EXTRACTOR CHAMBER REMOVAL/ INSTALLATION.)
4	Rear door garnish (See 09-16-3 REAR DOOR GARNISH REMOVAL/ INSTALLATION.)
5	Side protector (See 09-16-7 SIDE PROTECTOR REMOVAL.) (See 09-16-8 SIDE PROTECTOR INSTALLATION.)
6	Front flap (See 09-16-5 FRONT FLAP REMOVAL/ INSTALLATION.)
7	Door sash film (See 09-16-12 DOOR SASH FILM REMOVAL.) (See 09-16-13 DOOR SASH FILM INSTALLATION.)

8	Roof carrier bracket (See 09-16-11 ROOF CARRIER BRACKET REMOVAL/INSTALLATION.)
9	Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/ INSTALLATION.)
10	Radiator grille (See 09-16-5 RADIATOR GRILLE REMOVAL/ INSTALLATION.)
11	Front beltline molding (See 09-16-3 FRONT BELTLINE MOLDING REMOVAL/INSTALLATION.)
12	Rear beltline molding (See 09-16-3 REAR BELTLINE MOLDING REMOVAL/INSTALLATION.)
13	Side step molding (See 09-16-6 SIDE STEP MOLDING REMOVAL/ INSTALLATION.)

REAR DOOR GARNISH REMOVAL/INSTALLATION

id091600804200

1. Remove the sail garnish. (See09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
2. Remove the screws.
3. Disengage clip A from the body by squeezing it from inside of the vehicle, and remove the rear door garnish.
4. Install in the reverse order of removal.

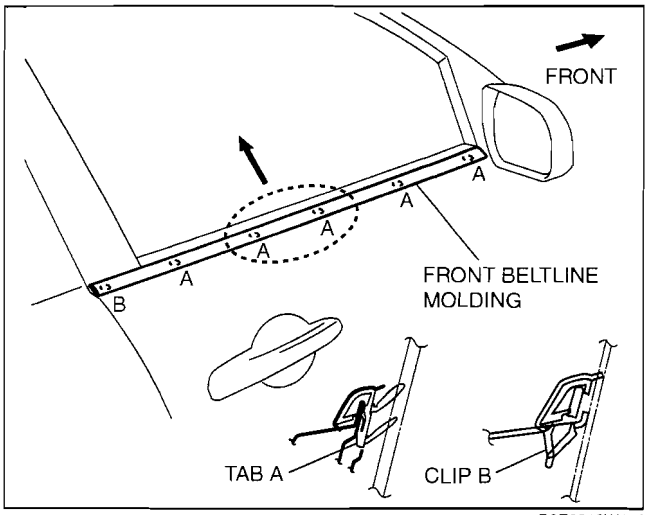


B3E0916W108

FRONT BELTLINE MOLDING REMOVAL/INSTALLATION

id091600804800

1. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
2. Remove the power outer mirror installation screws and move the mirror to access the front end of the front beltline molding. (See 09-12-32 POWER OUTER MIRROR REMOVAL/INSTALLATION.)
3. Raise the center of the front beltline molding and detach tabs A.
4. Using a small flathead screwdriver, detach clip B and remove the front beltline molding.
5. Install in the reverse order of removal.

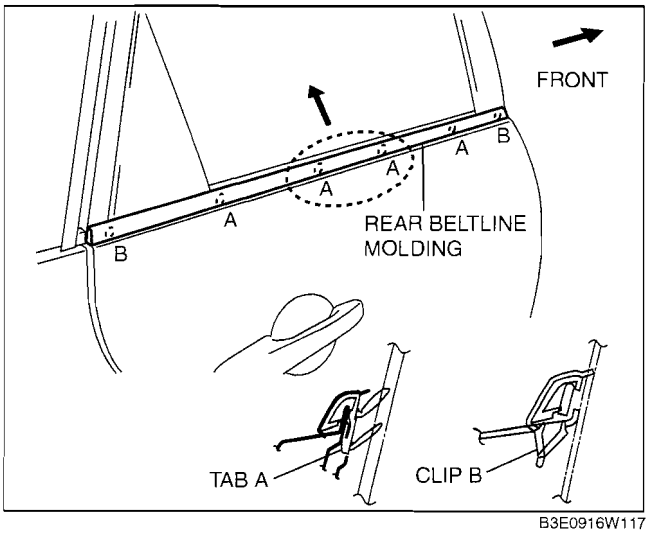


B3E0916W116

REAR BELTLINE MOLDING REMOVAL/INSTALLATION

id091600804700

1. Raise the center of the rear beltline molding and detach tabs A.
2. Using a small flathead screwdriver, detach clip B and remove the rear beltline molding.
3. Install in the reverse order of removal.

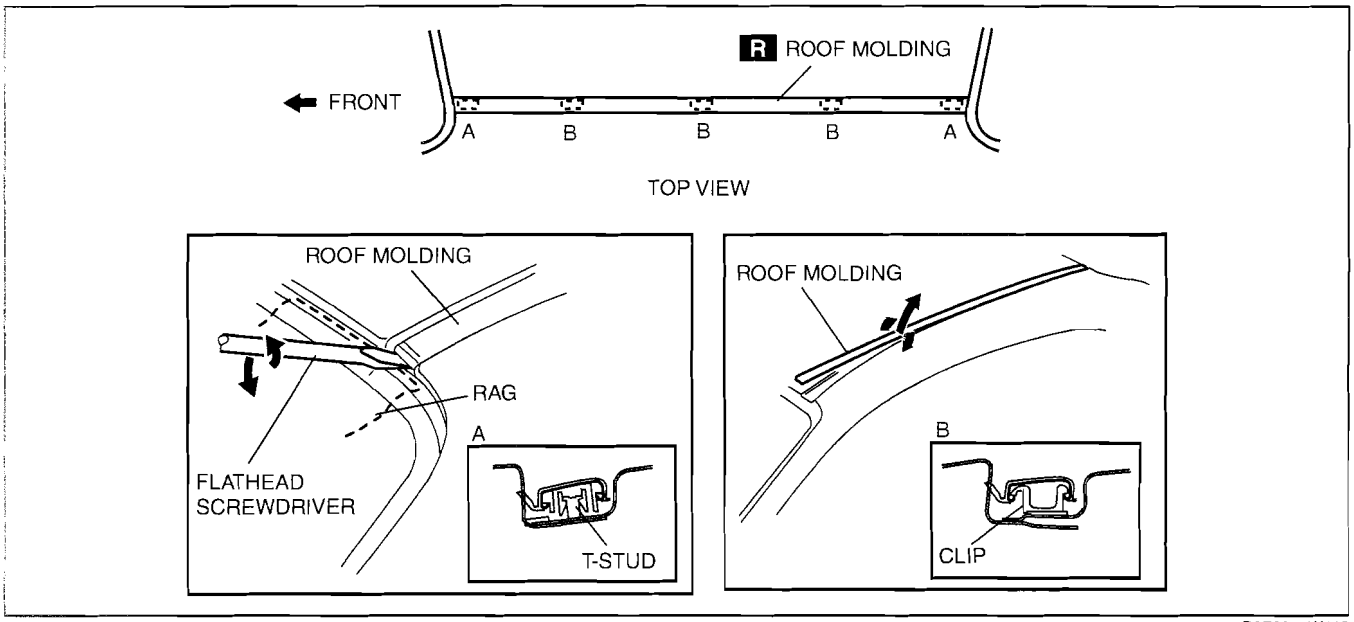


B3E0916W117

ROOF MOLDING REMOVAL

id091600800700

1. Detach the roof molding from the T-stud at section A, using a flathead screwdriver or equivalent tool.
2. While pulling the roof molding up, detach it from the clips at sections B, and then remove the roof molding.

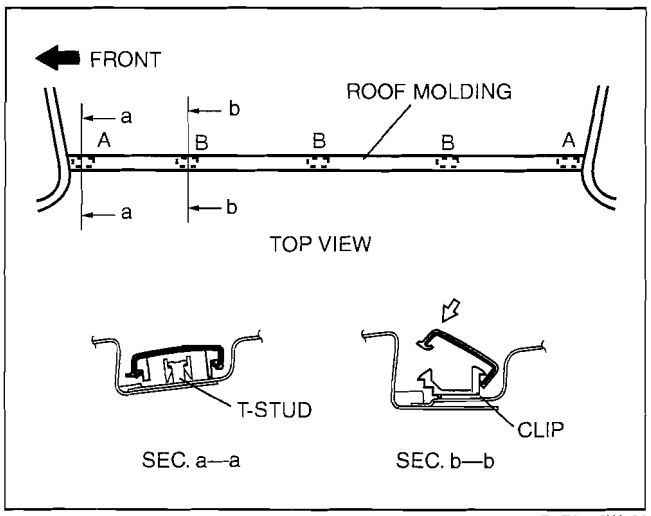


B3E0916W119

ROOF MOLDING INSTALLATION

id091600800800

1. Attach the roof molding to the T-stud at section A.
2. Hook the roof molding to clips B and press it in to attach.
3. Attach the roof molding to the T-stud at the rear portion of section A.



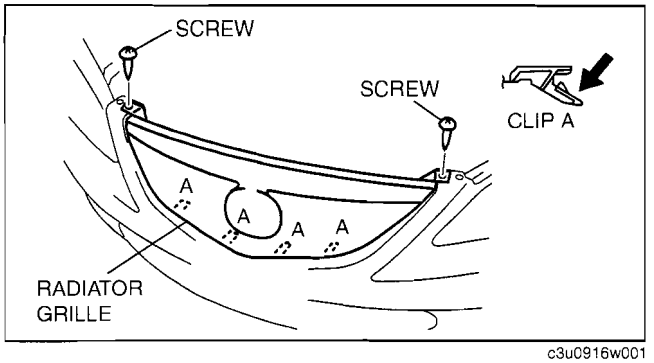
B3E0916W120

RADIATOR GRILLE REMOVAL/INSTALLATION

id091600800900

4 Door

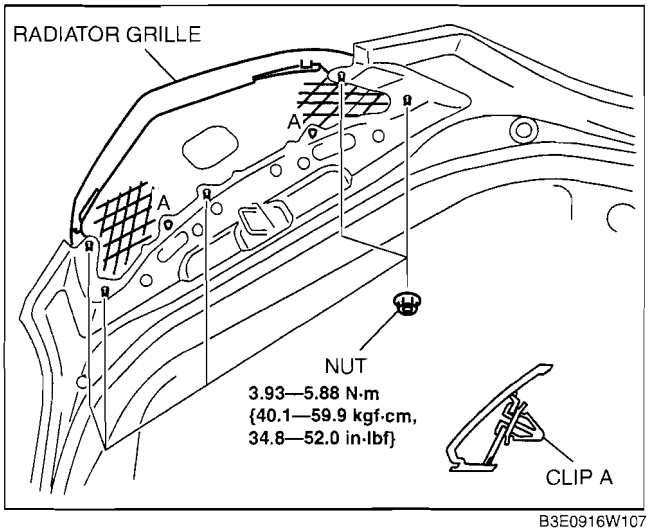
1. Remove the screws.
2. Press clip A in the direction of the arrow, pull the radiator grille outward and remove from the front bumper.
3. Install in the reverse order of removal.



c3u0916w001

5 Door

1. Remove the nuts.
2. Detach clips A and remove the radiator grille.
3. Install in the reverse order of removal.

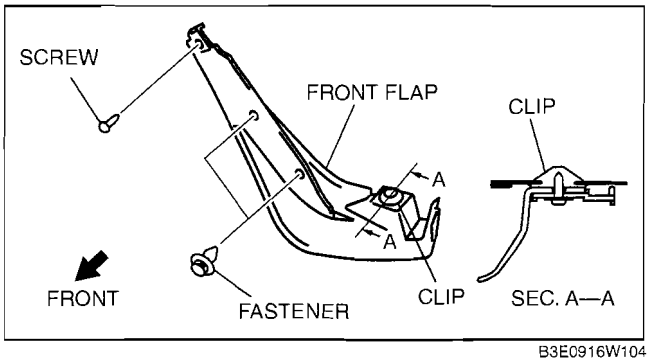


B3E0916W107

FRONT FLAP REMOVAL/INSTALLATION

id091600801900

1. Remove the screw and fasteners.
2. Detach the clip, then remove the front flap.
3. Install in the reverse order of removal.



B3E0916W104

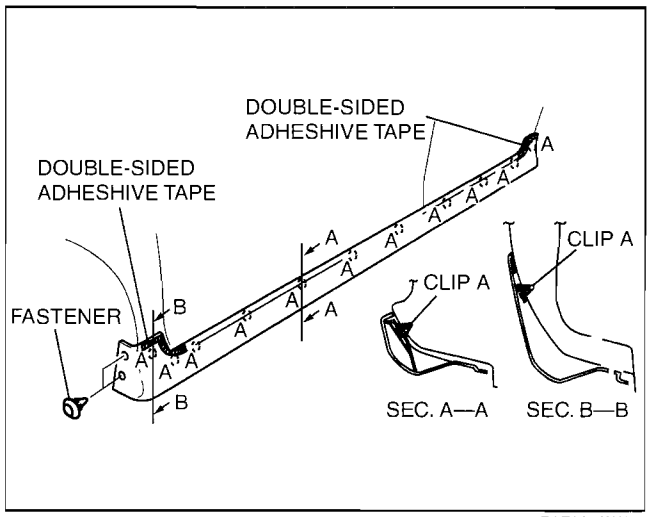
SIDE STEP MOLDING REMOVAL/INSTALLATION

id091600801800

1. Remove the fasteners.
2. While cutting the double-sided adhesive tape using a flathead screwdriver or a razor, separate the side step molding from the body.

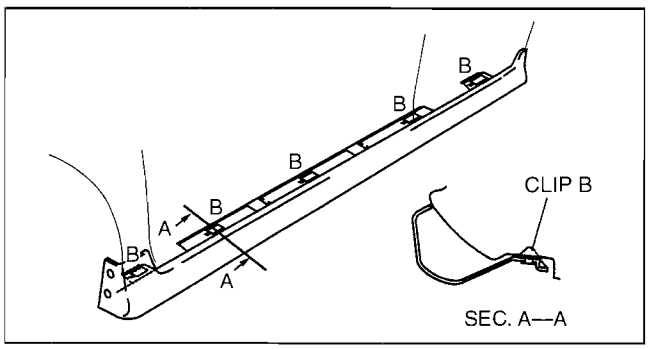
   Warning
   - **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

3. Pull the side step molding outward, then disengage clips A from the body.



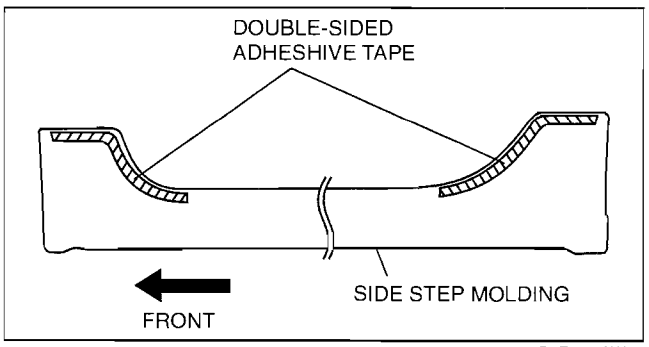
B3E0916W112

4. Slide the side step molding towards the front of the vehicle and remove clips B from the side step molding.
5. Remove the side step molding.



c3u0916w002

6. Install in the reverse order of removal.
   (1) Attach double-sided adhesive tape to the side step molding as shown in the figure.

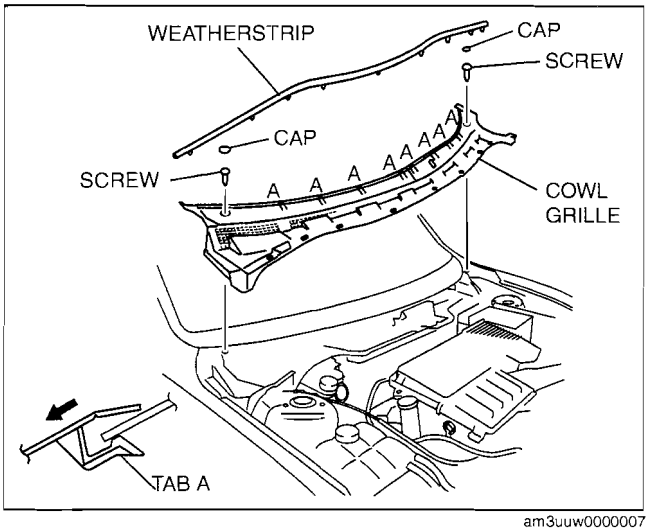


B3E0916W127

COWL GRILLE REMOVAL/INSTALLATION

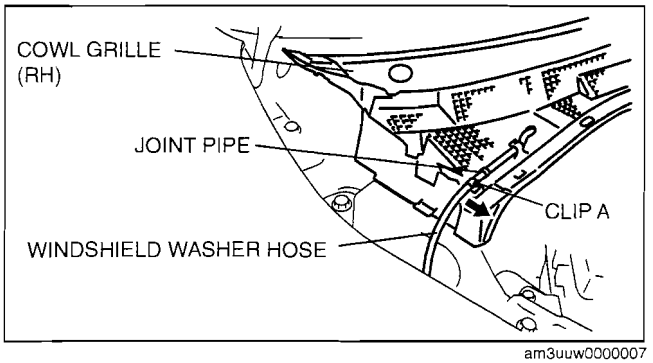
id091600801000

1. Remove the windshield wiper arm and blade. (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Using a small flathead screwdriver, remove the caps.
3. Remove the screws.
4. Remove the weatherstrip.
5. Move the cowl grille in the direction indicated by the arrow and disengage tabs A from the windshield.



am3uuw0000007

6. Disconnect the joint pipe, then pull the windshield hose in the direction of the arrow and remove it from clip A.(Mazdaspeed3)
7. Remove the cowl grille.
8. Install in the reverse order of removal.



am3uuw0000007

SIDE PROTECTOR REMOVAL

id091600801100

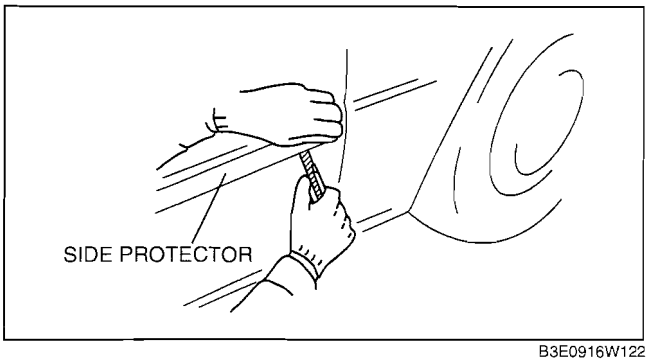
1. Pry the side protector end 20—30 mm {0.8—1.1 in} using a flathead screwdriver or a razor.

Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note

- The side protector is installed with double-sided adhesive tape. If the side protector is difficult to remove, warm the double-sided adhesive tape using a hot air blower.



B3E0916W122

2. Pull the side protector outward, then remove it from the body.

SIDE PROTECTOR INSTALLATION

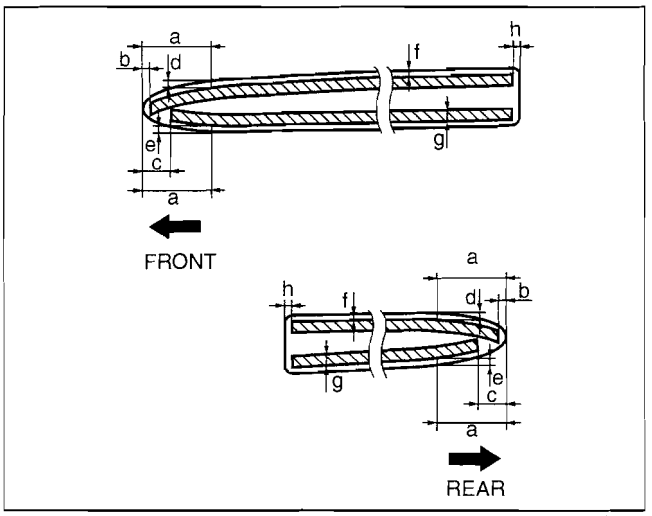
id091600801200

1. Remove the adhesive remaining on the side protector and the body using a razor.

Warning
- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

2. Remove any grease or dirt from the adhesion surface of the side protector and the body.
3. Attach double-sided adhesive tape to the side protector as shown in the figure.

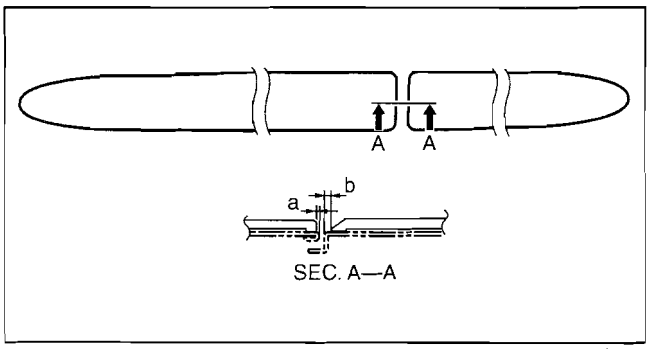
Clearance
a: 30 mm {1.2 in}
b: 2.0 mm {0.08 in}
c: 12 mm {0.47 in}
d: 3.0 mm {0.12 in}
e: 3.0 mm {0.12 in}
f: 1.0—3.0 mm {0.04—0.11 in}
g: 5.0 mm {0.2 in}
h: 1.0 mm {0.04 in}



B3E0916W110

4. Peel off the backing paper from the double-sided adhesive tape and attach the side protector onto the body as shown in the figure.

Clearance
a: 1.4—4.4 mm {0.056—0.17 in}
b: 3.0—6.0 mm {0.12—0.23 in}

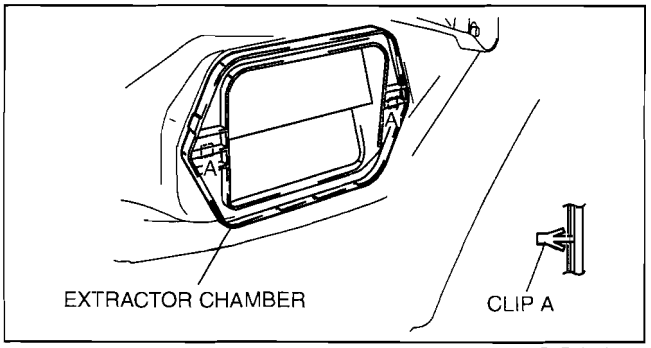


B3E0916W111

EXTRACTOR CHAMBER REMOVAL/INSTALLATION

id091600801500

1. Remove the following parts:
   (1) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (2) Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Rear combination light (See 09-18-14 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.)
   (4) Rear bumper (See 09-10-15 REAR BUMPER REMOVAL/INSTALLATION.)
2. Detach clips A by squeezing them from inside the vehicle, and remove the extractor chamber from the body.
3. Install in the reverse order of removal.



B3E0916W103

REAR SPOILER REMOVAL/INSTALLATION

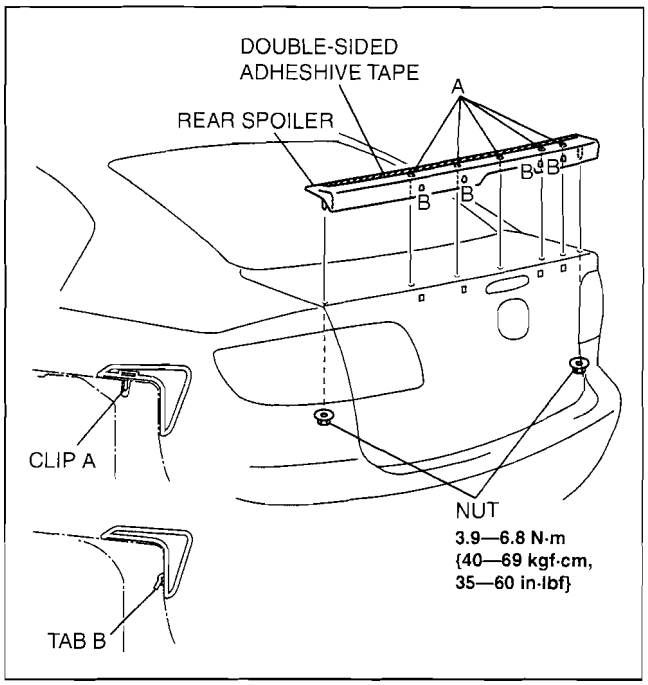
id091600801600

4 DOOR

1. Remove the nuts.
2. While cutting the double-sided adhesive tape using a flathead screwdriver or a razor, separate the rear spoiler from the trunk lid.

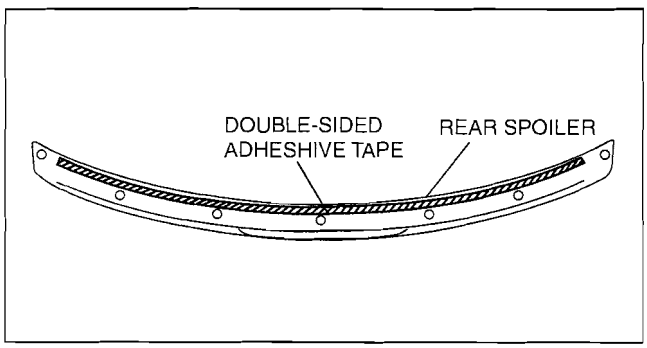
   Warning
   - **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

3. Pull the rear spoiler upward, then disengage clips A and tabs B from the trunk lid.
4. Remove the rear spoiler.



am3uuw0000007

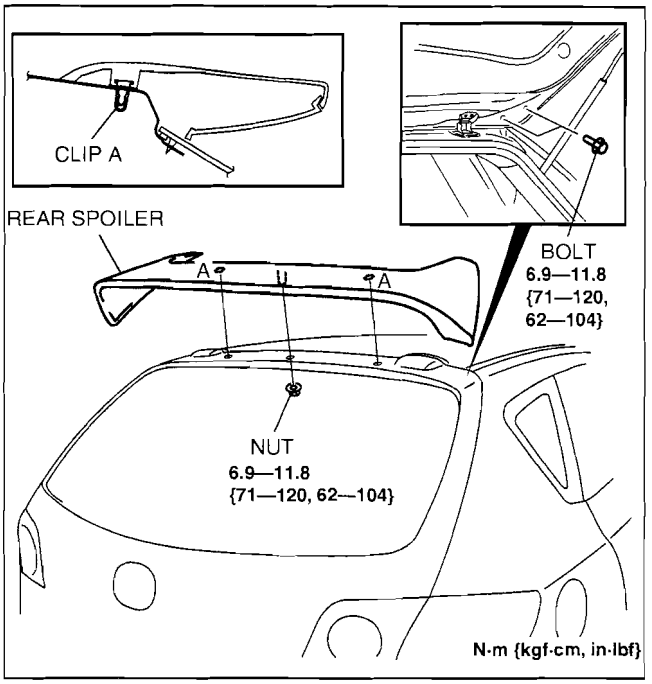
5. Install in the reverse order of removal.
   (1) Attach double-sided adhesive tape to the rear spoiler as shown in the figure.



am3uuw0000007

5 DOOR

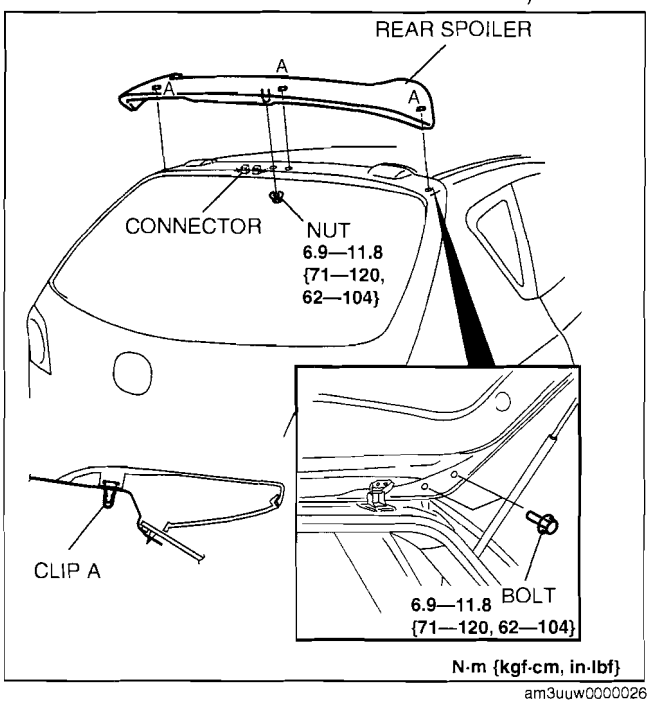
1. Remove the liftgate upper trim. (See09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
2. Remove the bolts and nut.
3. Pull the rear spoiler upward, then disengage clips A from the liftgate.
4. Remove the rear spoiler.
5. Install in the reverse order of removal.



am3uuw0000007

Mazdaspeed3

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Disconnect the connector.
4. Remove the bolts and nut.
5. Pull the rear spoiler upward, then disengage clips A from the liftgate.
6. Remove the rear spoiler.
7. Install in the reverse order of removal.



am3uuw0000026

REAR SPOILER DISASSEMBLY/ASSEMBLY

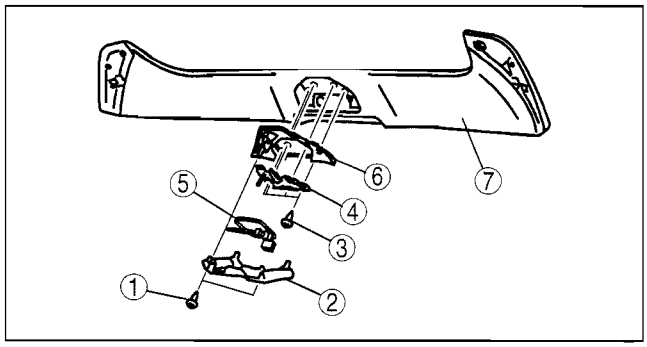
id091600803000

Mazdaspeed3

1. Disassemble in the order indicated in the table.

1	Screw
2	Cover
3	Screw
4	Bracket
5	Connector
6	Cover
7	Rear spoiler

2. Assemble in the reverse order of disassembly.



am3uuw0000026

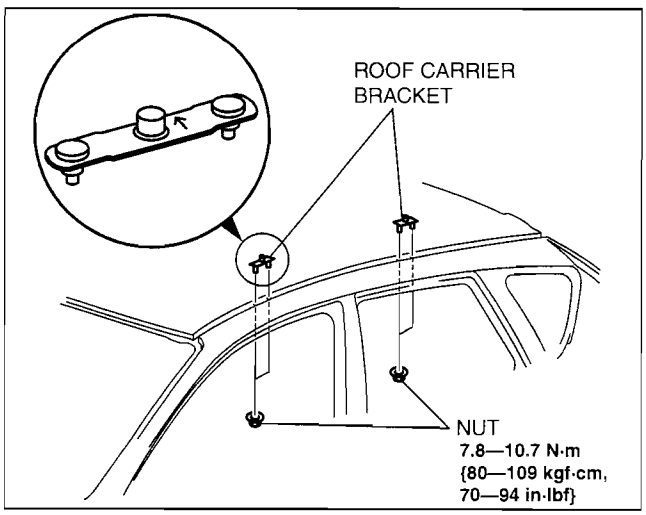
ROOF CARRIER BRACKET REMOVAL/INSTALLATION

id091600801700

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (4) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
   (16)Roof molding (See 09-16-4 ROOF MOLDING REMOVAL.) (See09-16-4 ROOF MOLDING INSTALLATION.)
2. Remove the nuts.
3. Remove the roof carrier bracket.
4. install in the reverse order of removal.

Note

- Install the roof carrier bracket so that the arrow on it faces inward.



B3E0916W121

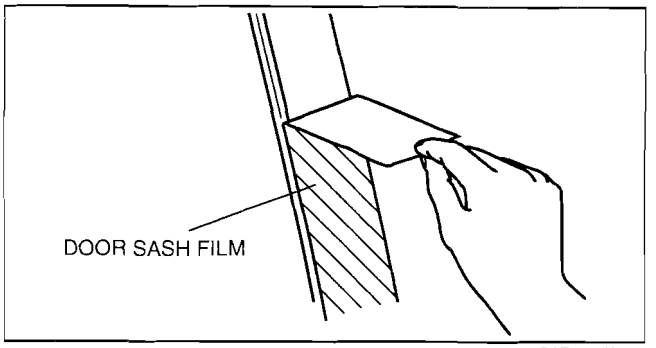
DOOR SASH FILM REMOVAL

id091600805600

1. Partially peel back the glass run channel.
2. Warm up the door sash film using a hot air blower.
3. Peel off the door sash film by pulling outward from one end.

Note

- Be sure to remove the door sash film slowly, because it can easily tear.

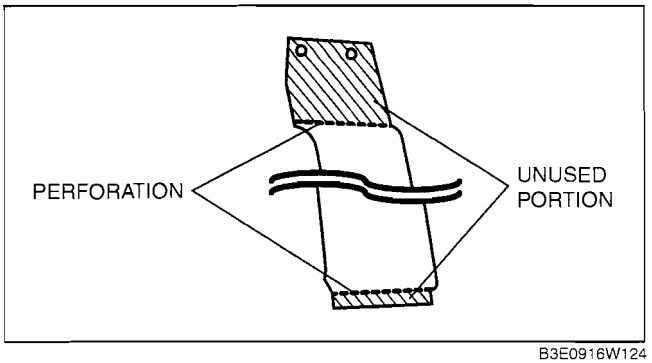


B3E0916W123

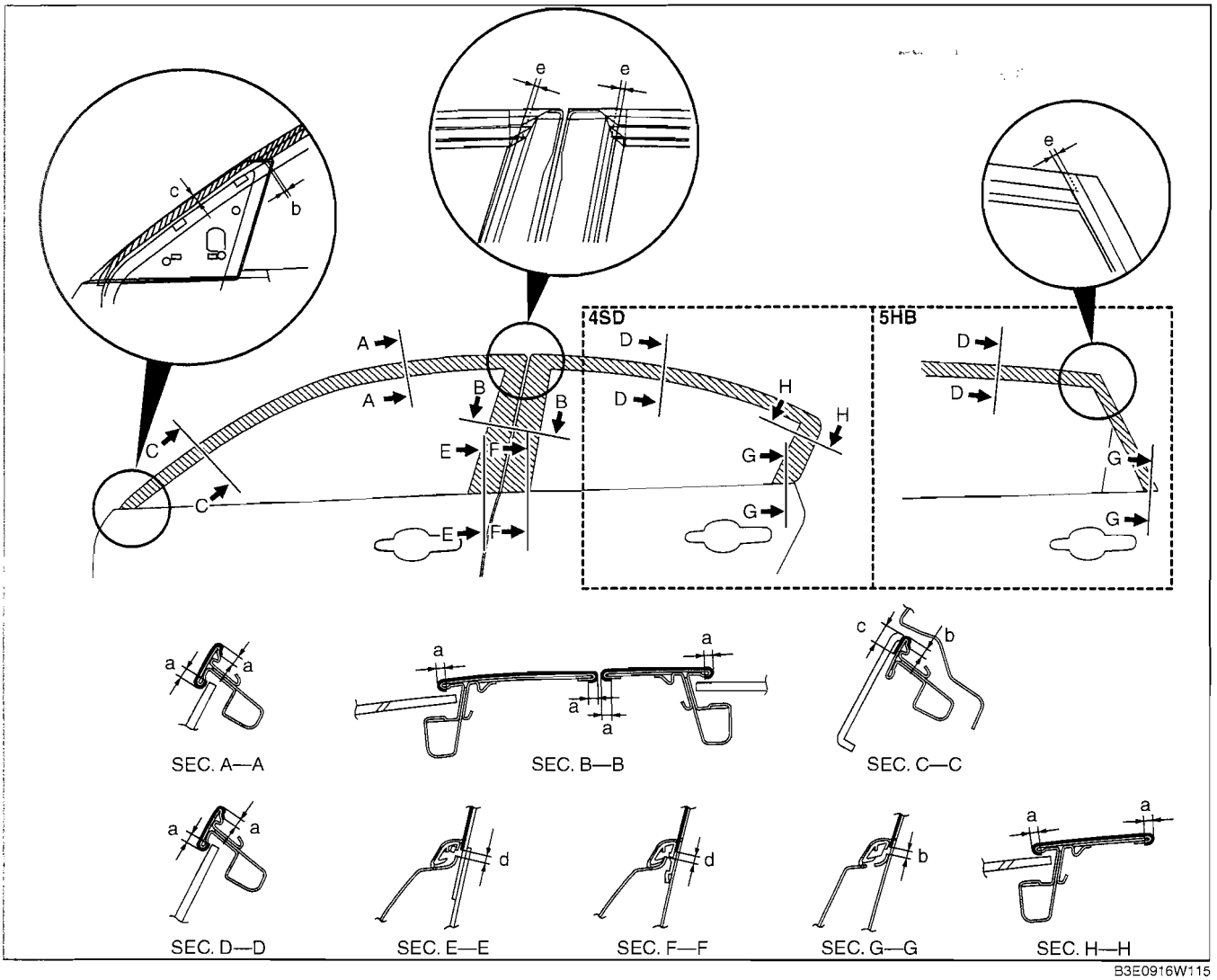
DOOR SASH FILM INSTALLATION

id091600805500

1. Remove any grease or dirt from the affixing surface of the door.
2. Cut away the unused portion along the dotted lines.
3. Peel off the backing paper and attach the door sash film onto the door as shown in the figure.



B3E0916W124



B3E0916W115

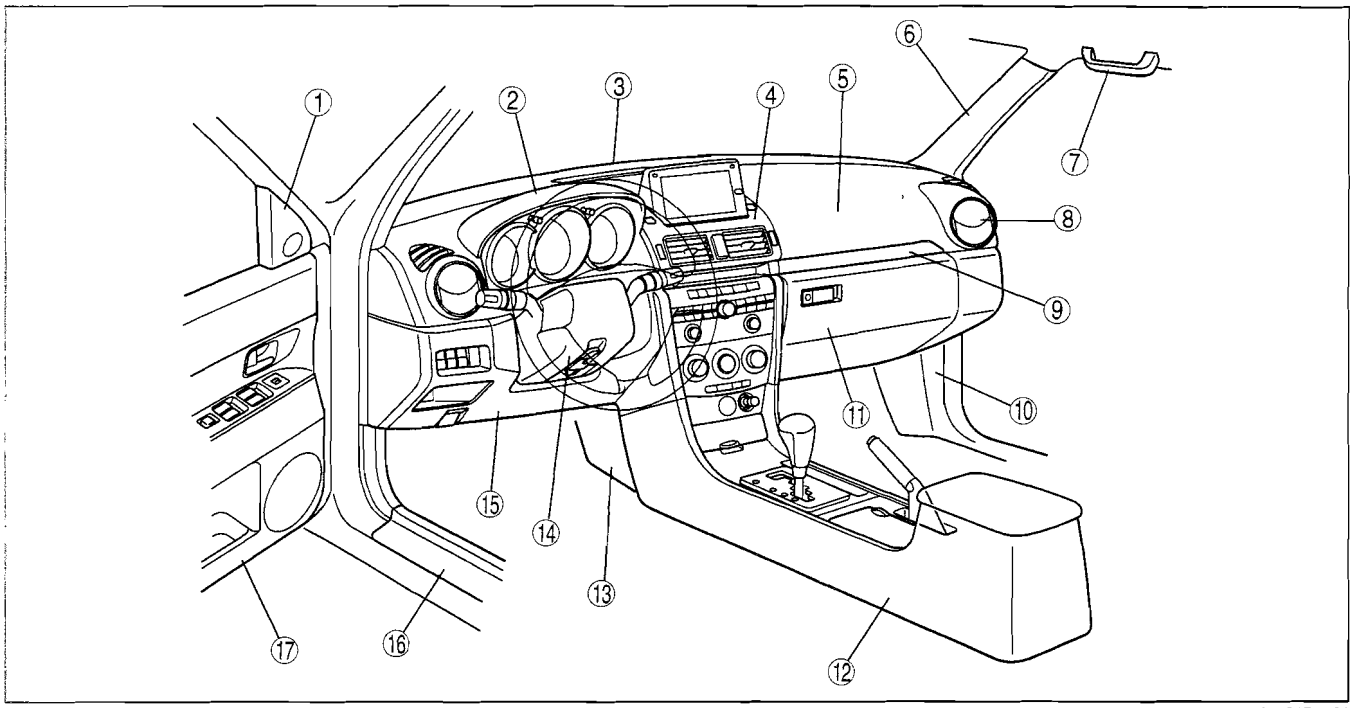
Standard clearance
a: 3.0—5.0 mm {0.12—0.19 in}
b: 3.0 mm {0.12 in}
c: 10.0 mm {0.39 in}
d: 3.0 mm {0.12 in} or less
e: 2.5—4.0 mm {0.10—0.15 in}

4. Peel off the transparent protective film on the door sash film.

09-17 INTERIOR TRIM

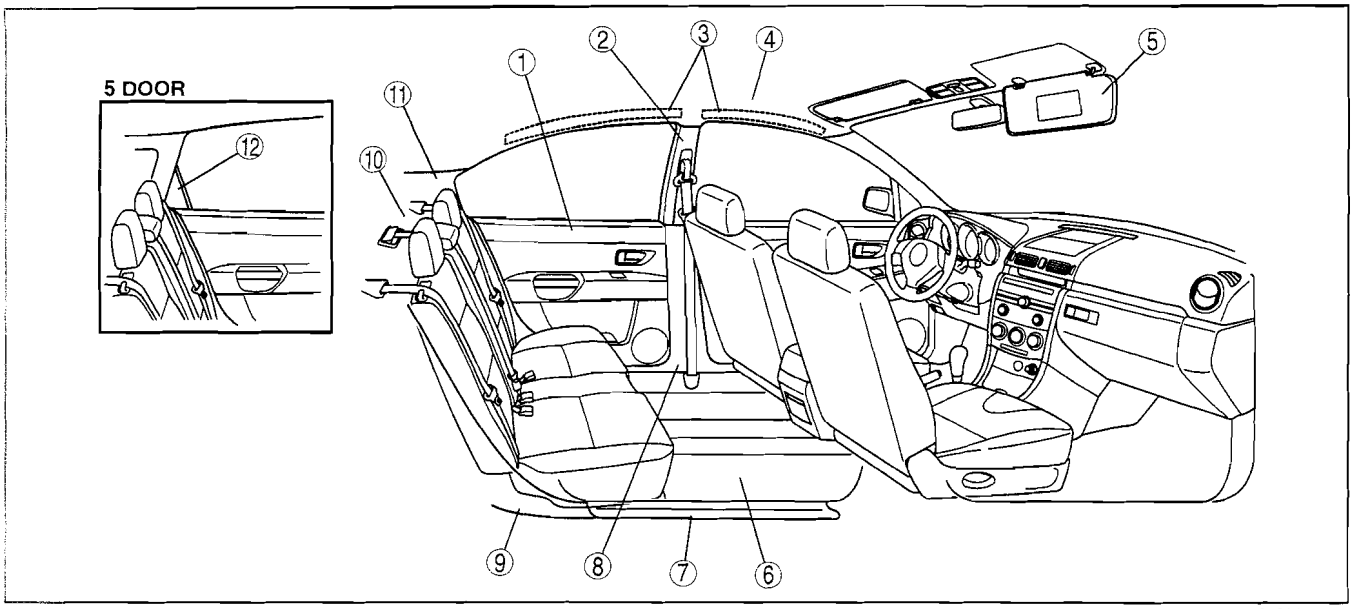
INTERIOR TRIM LOCATION INDEX

id091700800200



c3u0917w101

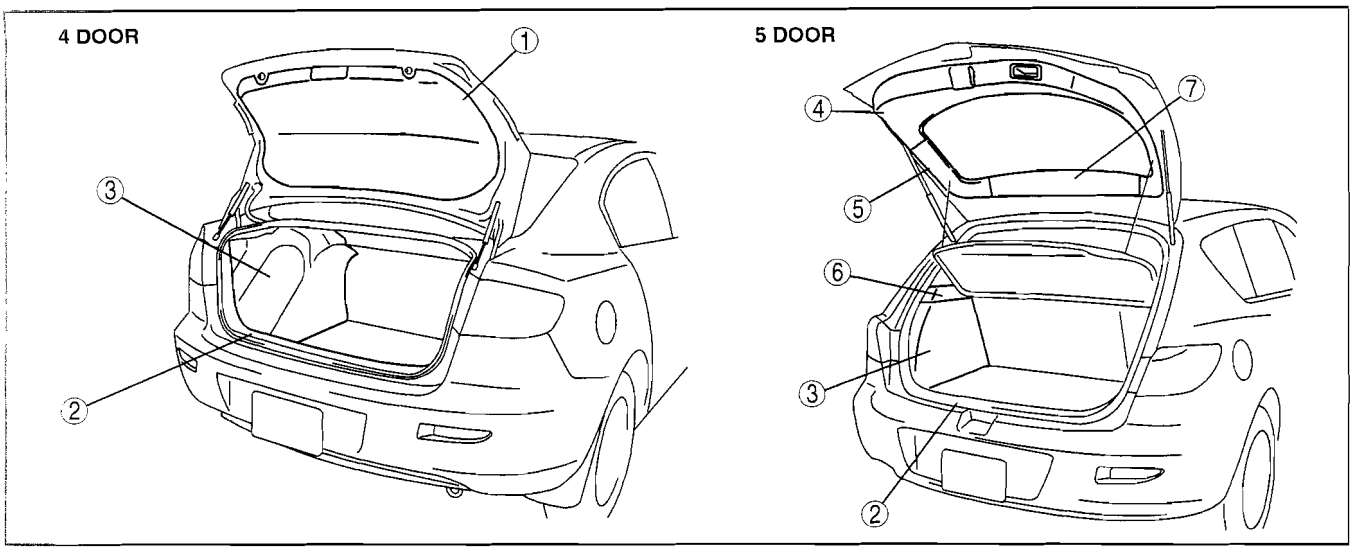
1	Inner garnish (See 09-17-18 INNER GARNISH REMOVAL/ INSTALLATION.)
2	Meter hood (See 09-17-8 METER HOOD REMOVAL/ INSTALLATION.)
3	Dashboard (See 09-17-4 DASHBOARD REMOVAL/ INSTALLATION.)
4	Dashboard center panel (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
5	Dashboard garnish (See 09-17-13 DASHBOARD GARNISH REMOVAL/ INSTALLATION.)
6	A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/ INSTALLATION.)
7	Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/ INSTALLATION.)
8	Ventilator grille (See 09-17-8 VENTILATOR GRILLE REMOVAL/ INSTALLATION.)
9	Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/ INSTALLATION.)
10	Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/ INSTALLATION.)
11	Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/ INSTALLATION.)
12	Console (See 09-17-10 CONSOLE REMOVAL/ INSTALLATION.) (See 09-17-11 CONSOLE DISASSEMBLY/ ASSEMBLY.)
13	Side wall (See 09-17-9 SIDE WALL REMOVAL/ INSTALLATION.)
14	Column cover (See 09-17-7 COLUMN COVER REMOVAL/ INSTALLATION.)
15	Lower panel (See 09-17-7 LOWER PANEL REMOVAL/ INSTALLATION.)
16	Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/ INSTALLATION.)
17	Front door trim (See 09-17-18 FRONT DOOR TRIM REMOVAL/ INSTALLATION.)



c3u0917w102

1	Rear door trim (See 09-17-19 REAR DOOR TRIM REMOVAL/ INSTALLATION.)
2	B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/ INSTALLATION.)
3	Head impact pad (See 09-17-16 HEAD IMPACT PAD REMOVAL/ INSTALLATION.)
4	Headliner (See 09-17-24 HEADLINER REMOVAL/ INSTALLATION.)
5	Sunvisor (See 09-17-23 SUNVISOR REMOVAL/ INSTALLATION.)
6	Floor covering (See 09-17-26 FLOOR COVERING REMOVAL/ INSTALLATION.)

7	Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/ INSTALLATION.)
8	B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/ INSTALLATION.)
9	Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/ INSTALLATION.)
10	Rear package trim (See 09-17-16 REAR PACKAGE TRIM REMOVAL/ INSTALLATION.)
11	C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/ INSTALLATION.)
12	Sail garnish (See 09-17-9 SAIL GARNISH REMOVAL/ INSTALLATION.)



c3u0917w103

1	Trunk lid trim (See 09-17-22 TRUNK LID TRIM REMOVAL/ INSTALLATION.)
2	Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/ INSTALLATION.)
3	Trunk side trim (See 09-17-20 TRUNK SIDE TRIM REMOVAL/ INSTALLATION.)
4	Liftgate lower trim (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)

5	Liftgate side trim (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/ INSTALLATION.)
6	Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
7	Liftgate upper trim (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/ INSTALLATION.)

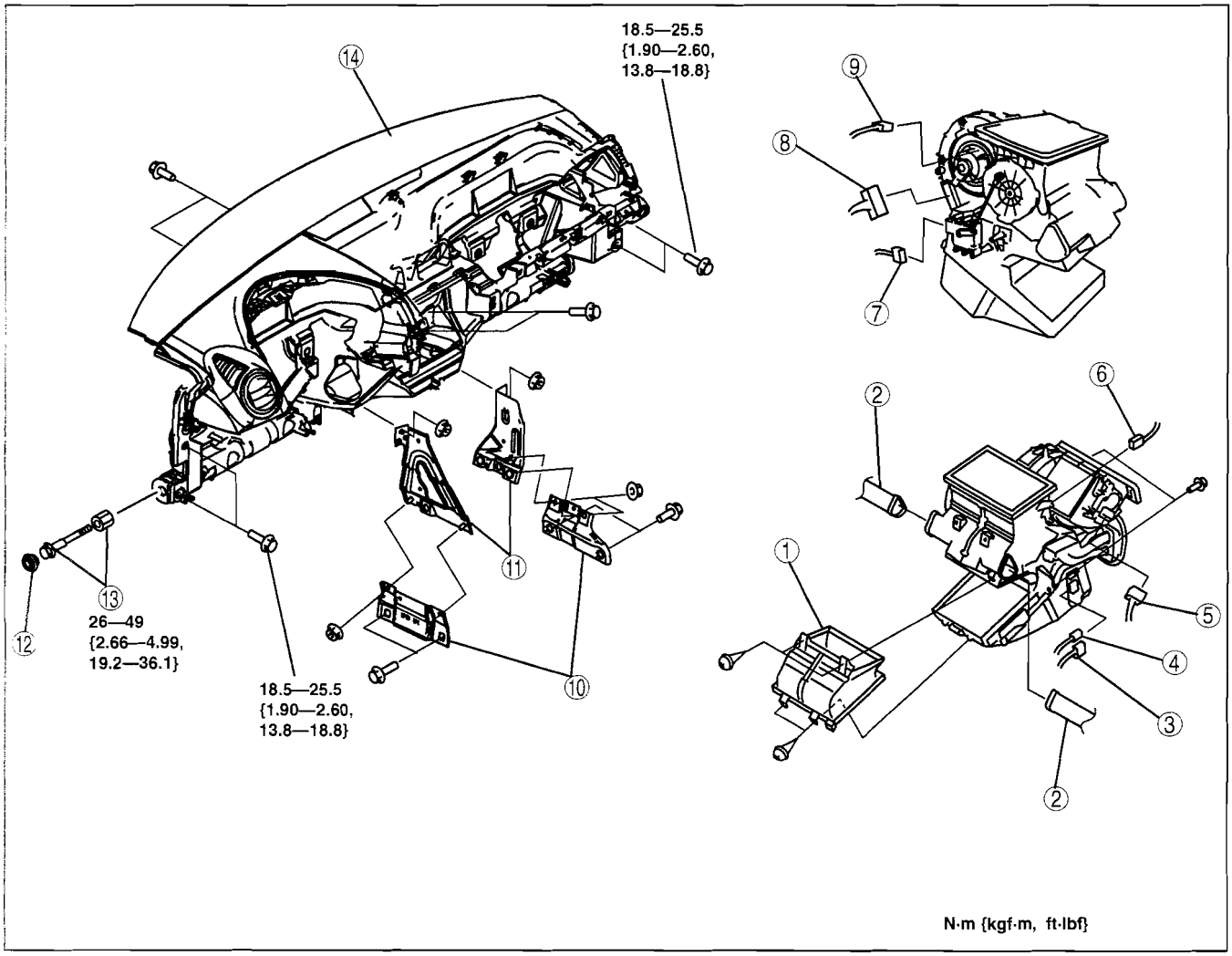
DASHBOARD REMOVAL/INSTALLATION

id091700800300

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front doors (See 09-11-3 FRONT DOOR REMOVAL/INSTALLATION)
   (2) Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION)
   (3) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (4) Shift lever component (MTX) (See 05-16-1 SHIFT MECHANISM REMOVAL/INSTALLATION[G35M-R]) (See 05-16-2 SHIFT MECHANISM REMOVAL/INSTALLATION[A26M-R].)
   (5) Selector lever component (ATX) (See 05-18-6 SELECTOR LEVER COMPONENT REMOVAL/ INSTALLATION)
   (6) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (7) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION)
   (8) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (9) PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION)
   (10)Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (11)Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (12)Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
   (13)Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
   (14)Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
   (15)Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)
   (16)Steering shaft (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
   (17)A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (18)Center panel module (See 09-20-4 CENTER PANEL UNIT REMOVAL/INSTALLATION.)
   (19)Climate control unit (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL/INSTALLATION[FULL-AUTO AIR CONDITIONER]) (See 07-40-29 CLIMATE CONTROL UNIT REMOVAL[MANUAL AIR CONDITIONER].)(See 07-40-31 CLIMATE CONTROL UNIT INSTALLATION[MANUAL AIR CONDITIONER].)
   (20)LCD unit (See 09-20-6 LCD UNIT REMOVAL/INSTALLATION.)
   (21)Rear heat duct (1) (See 07-11-14 REAR HEAT DUCT REMOVAL/INSTALLATION)

(22)Passenger-side air bag module (See 08-10-7 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
(23)Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION)
(24)Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION)
(25)Cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION)
(26)Cowl panel (See 09-10-20 COWL PANEL REMOVAL/INSTALLATION)
(27)Windshield wiper motor (See 09-19-4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION)

3. Disconnect the dashboard harness connectors.
4. Remove in the order indicated in the table.



am3uuw0000083

1	Heater case
2	Duct
3	Power MOS FET connector (with full-auto air conditioner system)
4	Evaporator temperature sensor connector
5	Air intake actuator connector
6	Air mix actuator connector (with full-auto air conditioner system)
7	Airflow mode actuator connector (with full-auto air conditioner system)
8	Resistor connector (with manual air conditioner system) (See 09-17-6 Resistor connector Disassembly Note.)

9	Blower motor connector (See 09-17-6 Blower motor connector Disassembly Note.)
10	Dashboard bracket (lower)
11	Dashboard bracket (upper)
12	Cap
13	Bolt (See 09-17-6 Bolt Removal Note.)
14	Dashboard

Warning

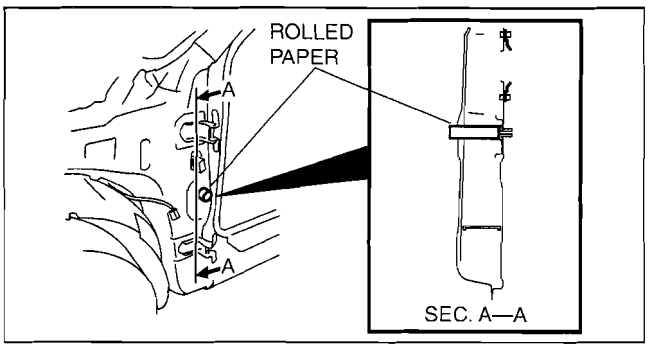
- **Removing the dashboard without supporting it can be dangerous. The dashboard may fall and injure you. Always perform the following procedure with at least another person.**

5. Remove the dashboard.
6. Take the dashboard off from the front driver-side door opening.
7. Install in the reverse order of removal.

Bolt Removal Note

Caution

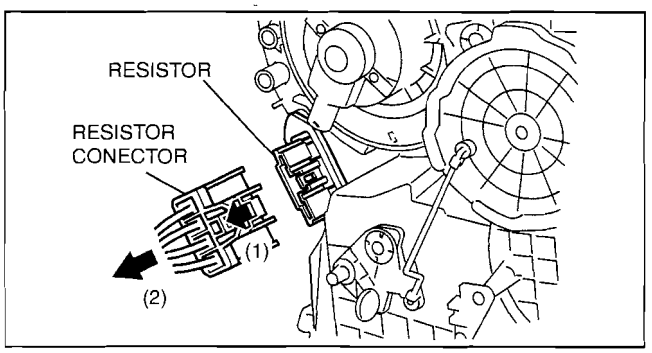
- **Bolt or tools dropped into the A-pillar are difficult to retrieve. To prevent this, roll regular paper into a tube, insert it into the hole, and hold it so that it does not move when performing the work.**



am3uuw0000083

Resistor connector Disassembly Note

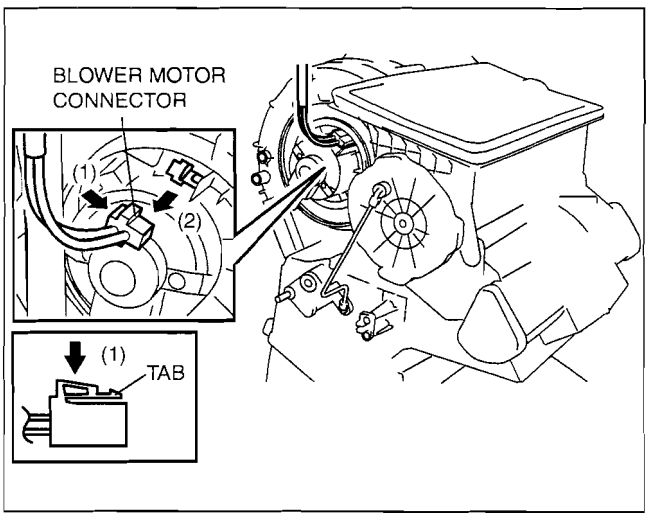
1. Disconnect the connector by pulling it in direction (2) while pressing the tab in direction (1).



e3u917zw6101

Blower motor connector Disassembly Note

1. Disconnect the connector by pulling it in direction (2) while pressing the tab in direction (1).

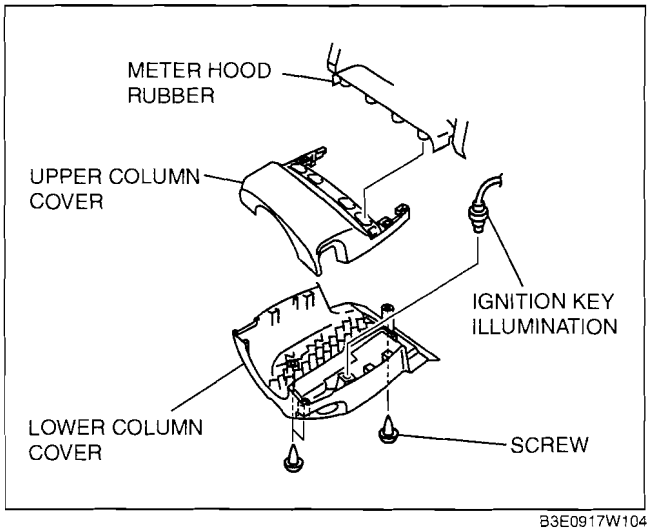


e3u917zw6100

COLUMN COVER REMOVAL/INSTALLATION

id091700800800

1. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
2. Detach the fit of the upper column cover from the meter hood rubber.
3. Remove the upper column cover.
4. Remove the ignition key illumination.
5. Remove the screws.
6. Remove the lower column cover.
7. Install in the reverse order of removal.

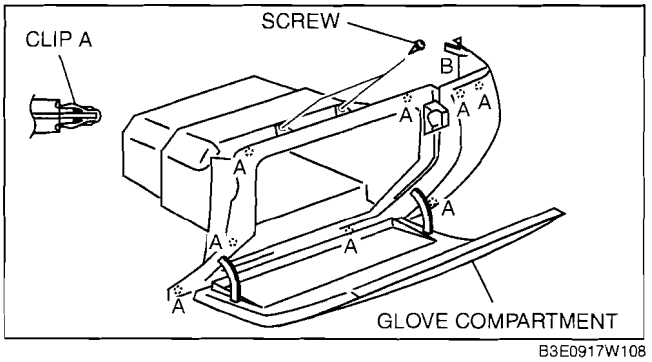


B3E0917W104

GLOVE COMPARTMENT REMOVAL/INSTALLATION

id091700800700

1. Remove the front scuff plate. (Passenger's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
2. Remove the front side trim. (Passenger's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
3. Remove the decoration panel. (See09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
4. Remove the screws.
5. Pull the glove compartment outward and detach clips A and tab B.
6. Remove the glove compartment.
7. Install in the reverse order of removal.

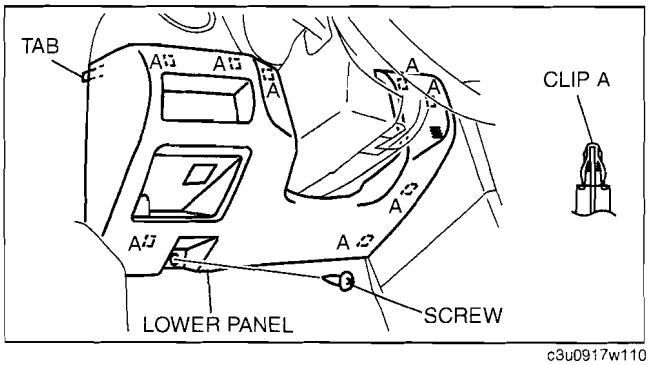


B3E0917W108

LOWER PANEL REMOVAL/INSTALLATION

id091700801100

1. Disconnect the negative battery cable.
2. Detach the hood release lever from the lower panel. (See09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
3. Remove the front scuff plate. (Driver's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the front side trim. (Driver's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
5. Remove the screw.
6. Pull the lower panel outward, and detach clips A and tab.
7. Disconnect the panel light control switch connector and the headlight leveling switch connector.
8. Remove the lower panel.
9. Install in the reverse order of removal.

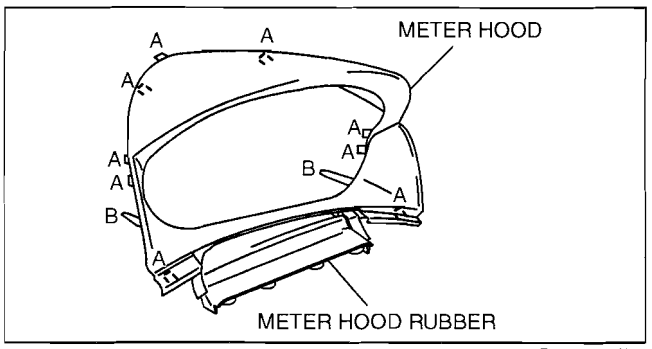


c3u0917w110

METER HOOD REMOVAL/INSTALLATION

id091700800900

1. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Decoration panel (See09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (4) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (5) Lower panel (See09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
2. Detach the fit of the meter hood rubber from the upper column cover.
3. Pull the meter hood outward and detach the tabs A and locator pins B.
4. Remove the meter hood.
5. Install in the reverse order of removal.



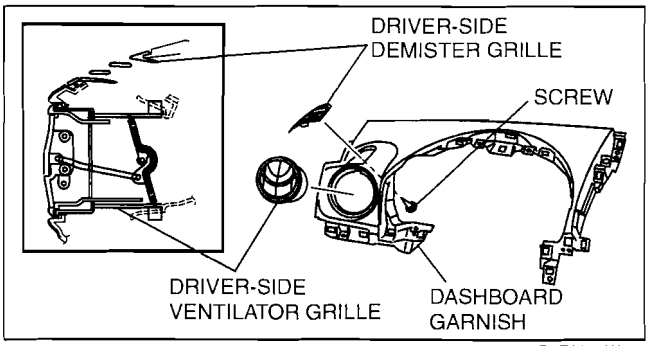
B3E0917W105

VENTILATOR GRILLE REMOVAL/INSTALLATION

id091700804600

Driver's Side

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (5) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (6) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (7) Dashboard center panel (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
   (8) Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
   (9) Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
   (10)Dashboard garnish (See 09-17-13 DASHBOARD GARNISH REMOVAL/INSTALLATION.)
3. Pull the driver-side ventilator grille outward and remove it.
4. Remove the screw, then remove the driver-side demister grille.
5. Install in the reverse order of removal.

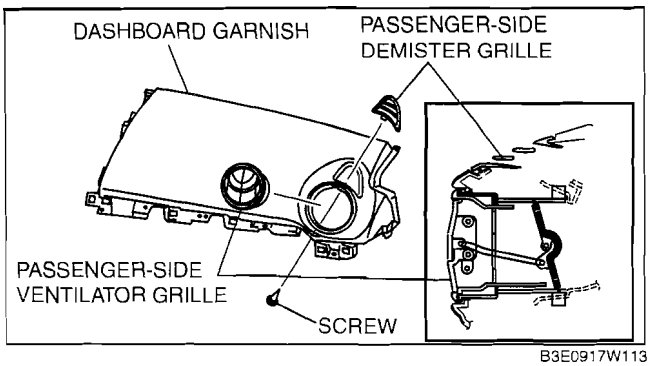


B3E0917W112

Passenger's Side

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (5) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (6) Dashboard center panel (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
   (7) Dashboard garnish (See 09-17-13 DASHBOARD GARNISH REMOVAL/INSTALLATION.)
3. Pull the passenger-side ventilator grille outward and remove it.

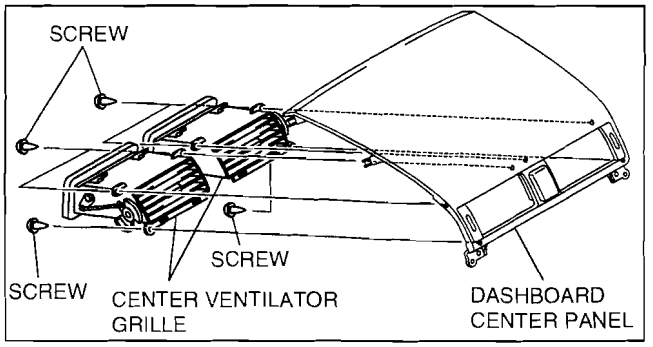
4. Remove the screw, then remove the passenger-side demister grille.
5. Install in the reverse order of removal.



B3E0917W113

Center

1. Remove the decoration panel. (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
2. Remove the dashboard center panel. (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
3. Remove the screws, then remove the center ventilator grilles.
4. Install in the reverse order of removal.

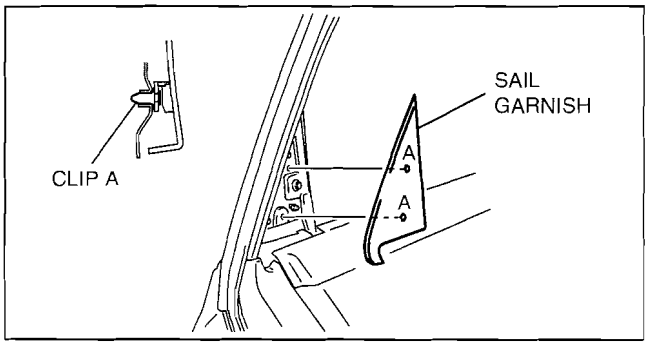


B3E0917W114

SAIL GARNISH REMOVAL/INSTALLATION

id091700805000

1. Pull the sail garnish outward and detach clips A.
2. Remove the sail garnish.
3. Install in the reverse order of removal.

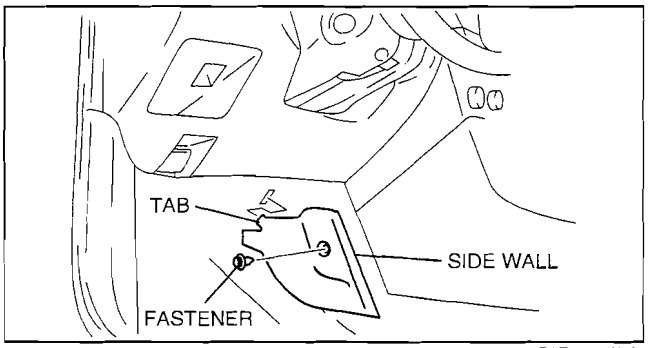


B3E0917W146

SIDE WALL REMOVAL/INSTALLATION

id091700805400

1. Remove the fastener.
2. Detach the tab and remove the side wall.
3. Install in the reverse order of removal.

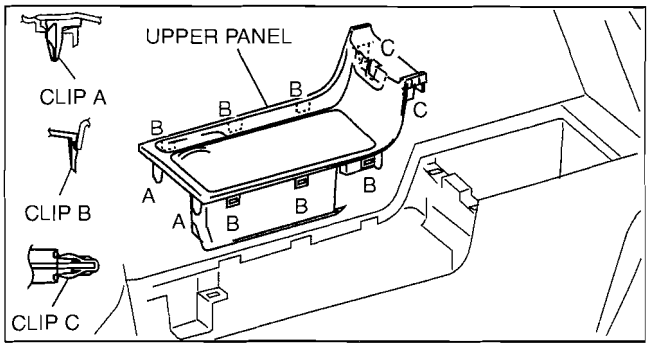


B3E0917W161

CONSOLE REMOVAL/INSTALLATION

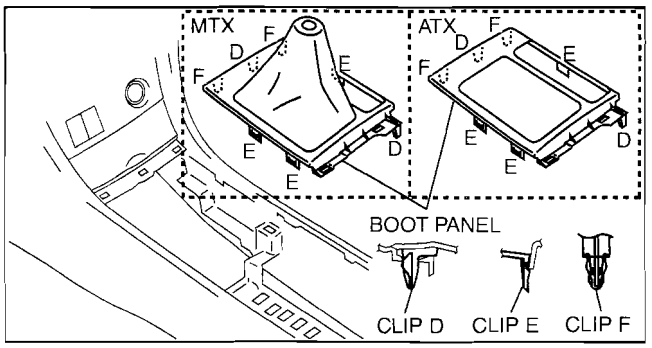
id091700801200

1. Disconnect the negative battery cable.
2. Detach clips A, B and C and remove the upper panel.



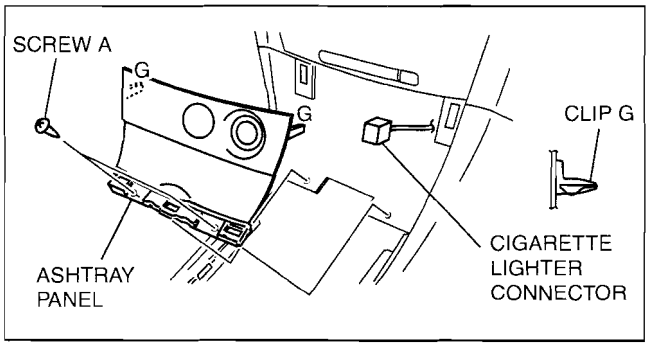
am3uuw0000073

3. Detach clips D, E and F and remove the boot panel.



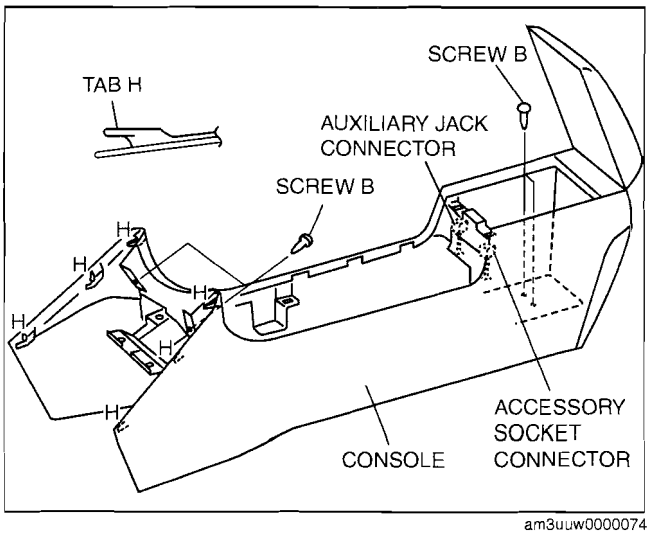
am3uuw0000073

4. Remove screws A.
5. Detach clips G.
6. Disconnect the cigarette lighter connector.
7. Remove the ashtray illumination, then remove the ashtray panel.



c3u0917w155

8. Remove the screws B.
9. Detach tabs H and remove the console.
10. Disconnect the auxiliary jack connector.
11. Disconnect the accessory socket connector.
12. Install in the reverse order of removal.



am3uuw0000074

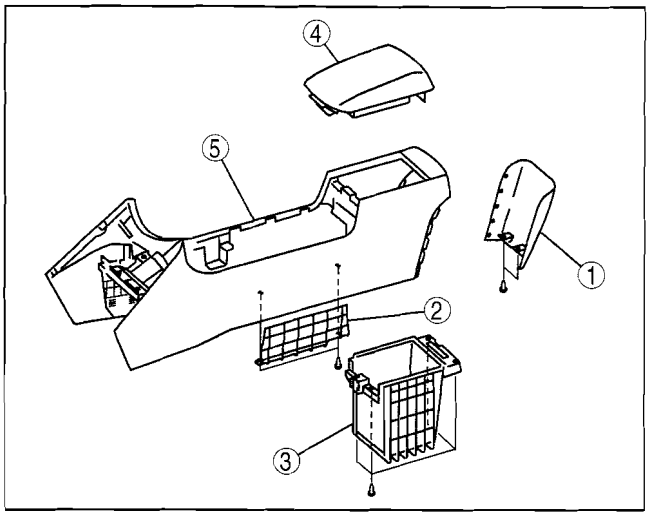
CONSOLE DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Console panel
2	Plate
3	Rear console box
4	Console lid
5	Console

2. Assemble in the reverse order of disassembly.

id091700801300

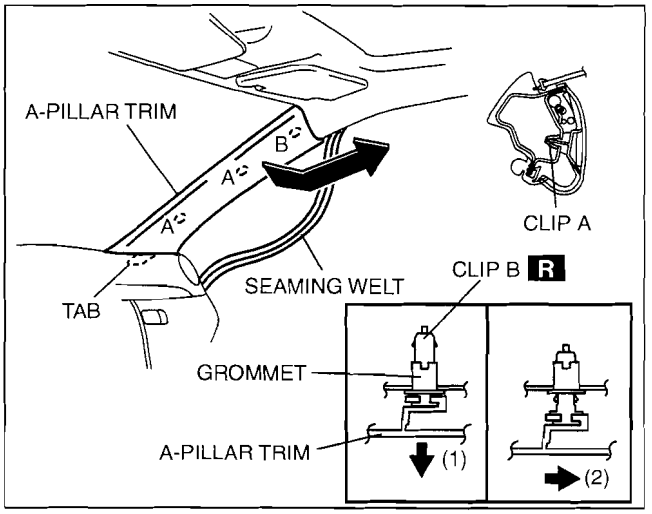


c3u0917w106

A-PILLAR TRIM REMOVAL/INSTALLATION

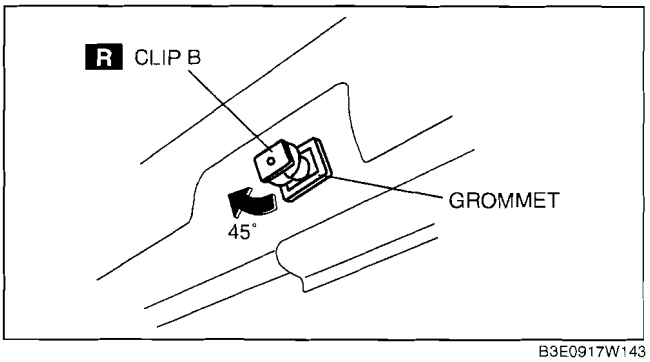
1. Partially peel back the seaming welt.
2. Detach clips A using a fastener remover.
3. Pull the A-pillar trim and detach clip B (1).
4. Pull the A-pillar trim upward and remove clip B from the A-pillar trim (2).

id091700801900



B3E0917W125

5. Pull clip B out and rotate it **45°**.
6. Remove clip B from the grommet by pulling it upward.
7. Install in the reverse order of removal.



B3E0917W143

B-PILLAR LOWER TRIM REMOVAL/INSTALLATION

id091700802000

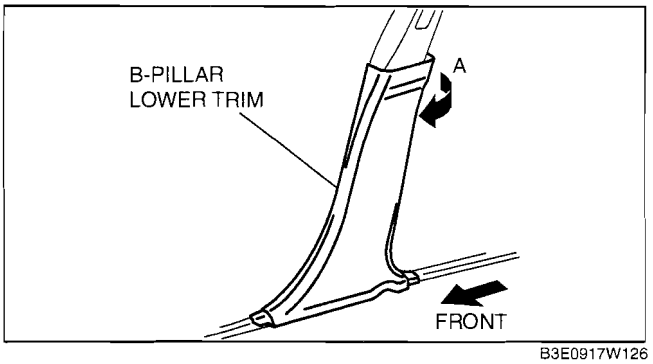
Warning

- **Handling the side air bag sensor improperly can accidentally deploy the side air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before working around the B-pillar areas. (See08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.)**

Note

- The side air bag sensor is located in the B-pillar.

1. Remove the front scuff plate. (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
2. Remove the rear scuff plate. (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
3. Pull the area marked A, then remove one side of the B-pillar lower trim.
4. Pull the B-pillar lower trim outward and remove it.
5. Install in the reverse order of removal.

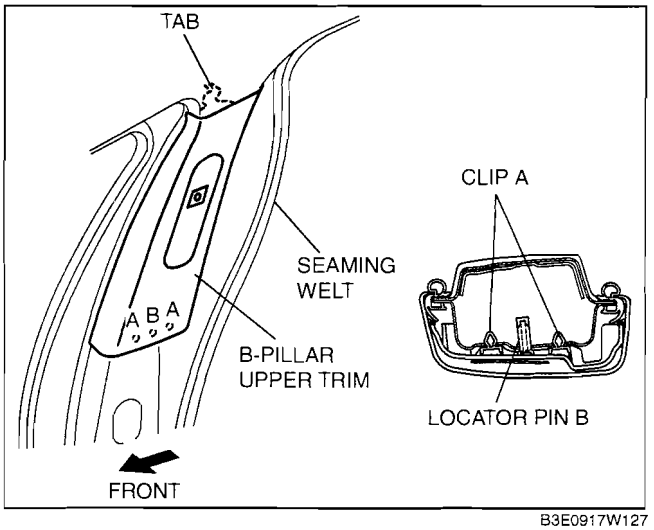


B3E0917W126

B-PILLAR UPPER TRIM REMOVAL/INSTALLATION

id091700802100

1. Remove the following parts:
   (1) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Rear scuff plate (See09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
2. Partially peel back the seaming welt.
3. Pull the B-pillar upper trim outward and detach clips A and locator pin B from the body.
4. Detach the tab from the body and remove the B-pillar trim.
5. Install in the reverse order of removal.



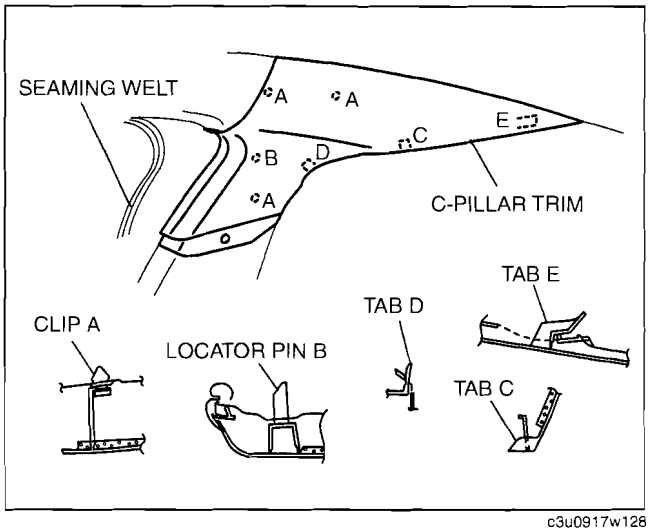
B3E0917W127

C-PILLAR TRIM REMOVAL/INSTALLATION

id091700802200

4 Door

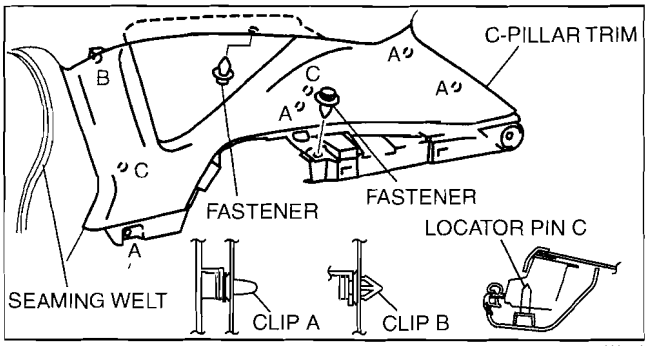
1. Remove the rear seat. (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
2. Remove the rear scuff plate. (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
3. Remove the tire house trim. (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
4. Partially peel back the seaming welt.
5. Detach clips A and locator pin B, using a fastener remover.
6. Detach tabs C, D and E from the body and remove the C-pillar trim.
7. Install in the reverse order of removal.



c3u0917w128

5 Door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
2. Partially peel back the seaming welt.
3. Remove the fasteners.
4. Detach clips A, B and locator pins C, using a fastener remover.
5. Remove the C-pillar trim.
6. Install in the reverse order of removal.



B3E0917W139

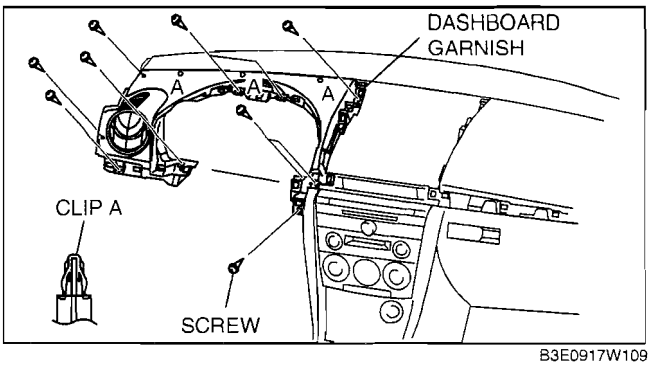
DASHBOARD GARNISH REMOVAL/INSTALLATION

id091700804700

Driver's Side

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (5) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (6) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (7) Dashboard center panel (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
   (8) Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
   (9) Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)

3. Remove the screws.
4. Pull the dashboard garnish outward, and detach clips A.
5. Remove the dashboard garnish.
6. Install in the reverse order of removal.



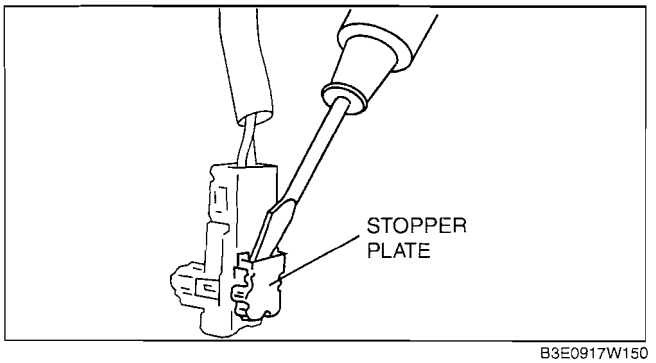
B3E0917W109

Passenger's Side

Warning

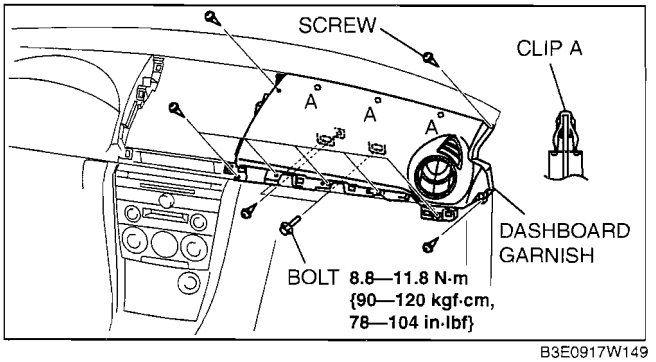
- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the service warnings and cautions before handling the air bag module. (See 08-10-3 AIR BAG SYSTEM SERVICE WARNINGS.) (See08-10-5 AIR BAG SYSTEM SERVICE CAUTIONS.)**

1. Disconnect the negative battery cable and wait for **1 min or more**.
2. Remove the following parts:
   (1) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (5) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (6) Dashboard center panel (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
3. Using a flathead screwdriver, pry out the connector stopper plate.
4. Disconnect the passenger-side air bag module connector.



B3E0917W150

5. Remove the bolts and screws.
6. Pull the dashboard garnish outward, and detach clips A.
7. Remove the dashboard garnish.
8. Install in the reverse order of removal.

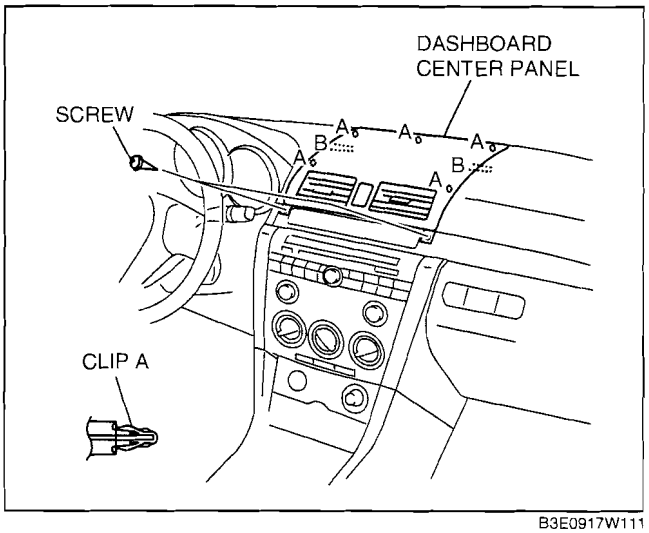


B3E0917W149

DASHBOARD CENTER PANEL REMOVAL/INSTALLATION

id091700805800

1. Disconnect the negative battery cable.
2. Remove the decoration panel. (See09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
3. Remove the screws.
4. Pull the dashboard center panel outward and detach clips A and locator pins B.
5. Disconnect the hazard warning switch connector.
6. Remove the dashboard center panel.
7. Install in the reverse order of removal.

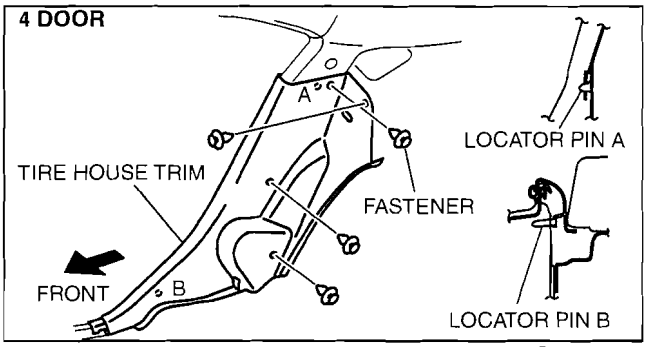


B3E0917W111

TIRE HOUSE TRIM REMOVAL/INSTALLATION

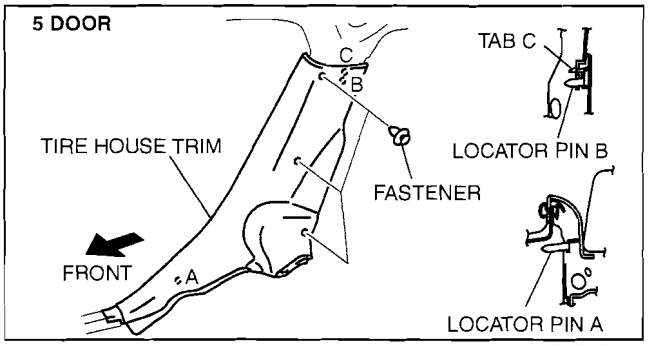
id091700802700

1. Remove the rear seat. (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
2. Remove the rear scuff plate. (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
3. Remove the fasteners.



B3E0917W132

4. Pull the tire house trim outward and detach locator pins A and B. (4 door)
5. Pull the tire house trim outward and detach locator pins A, B and tab C. (5 door)
6. Remove the tire house trim.
7. Install in the reverse order of removal.

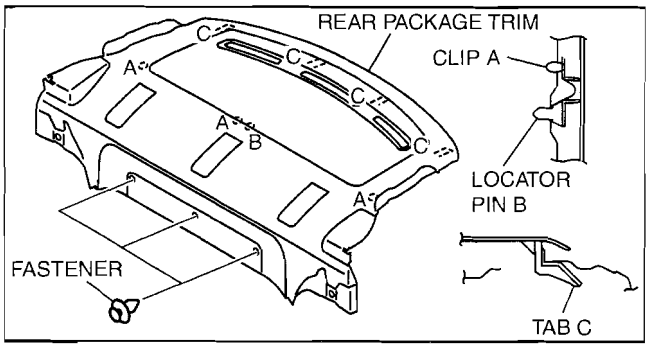


c3u0917w142

REAR PACKAGE TRIM REMOVAL/INSTALLATION

id091700802800

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
2. Remove the fasteners.
3. Pull the rear package trim upward and detach clips A and locator pin B from the body.
4. Detach tabs C from the body and remove the rear package trim.
5. Install in the reverse order of removal.

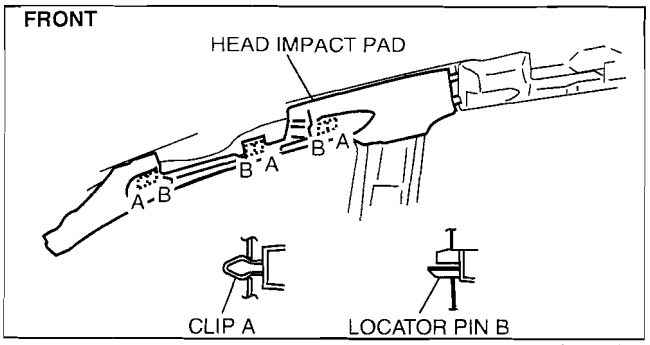


B3E0917W133

HEAD IMPACT PAD REMOVAL/INSTALLATION

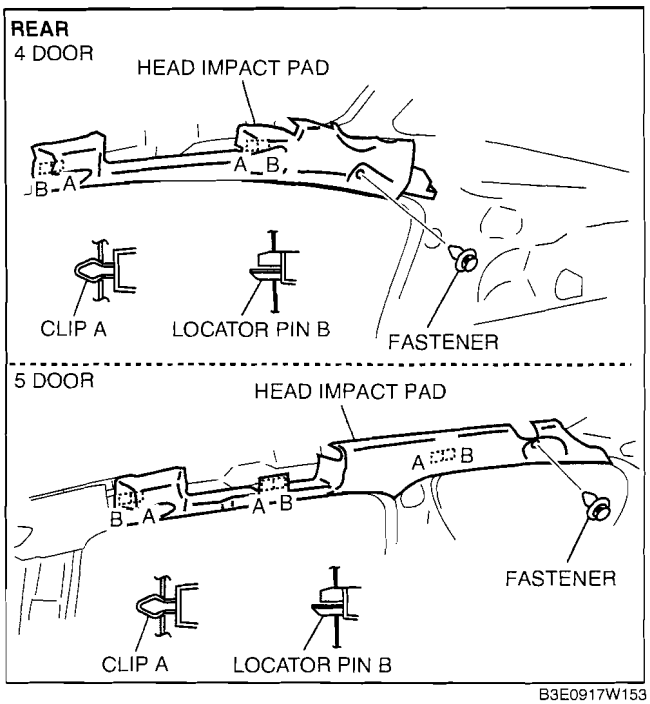
id091700806500

1. Remove the following parts:
   (1) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (2) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (3) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (5) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (6) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (7) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (8) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (9) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (10)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (11)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (12)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (13)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (14)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (15)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
2. Remove the fastener. (Rear)



B3E0917W135

3. Pull the head impact pad outward and detach the clips A and the locator pins B.
4. Remove the head impact pad.
5. Install in the reverse order of removal.

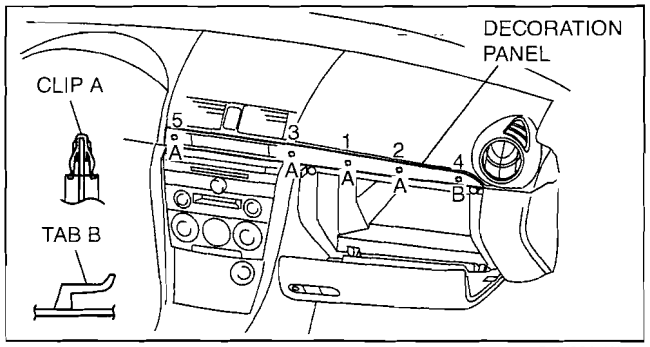


B3E0917W153

DECORATION PANEL REMOVAL/INSTALLATION

id091700806600

1. Pull the decoration panel outward and detach the clips A and tab B in the order shown in the figure.
2. Remove the decoration panel.
3. Install in the reverse order of removal.

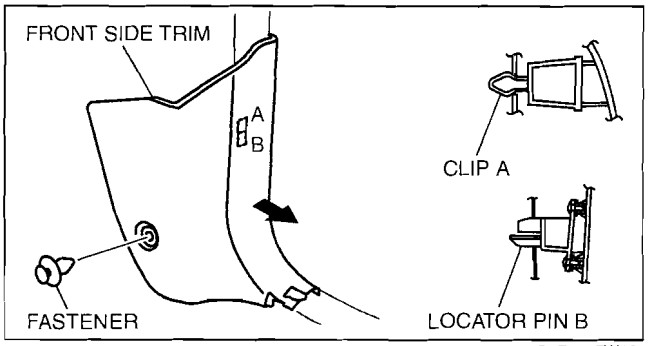


C3U0917W151

FRONT SIDE TRIM REMOVAL/INSTALLATION

id091700802400

1. Remove the front scuff plate. (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
2. Remove the fastener.
3. Pull the front side trim in the direction of the arrow and detach clip A and locator pin B.
4. Install in the reverse order of removal.

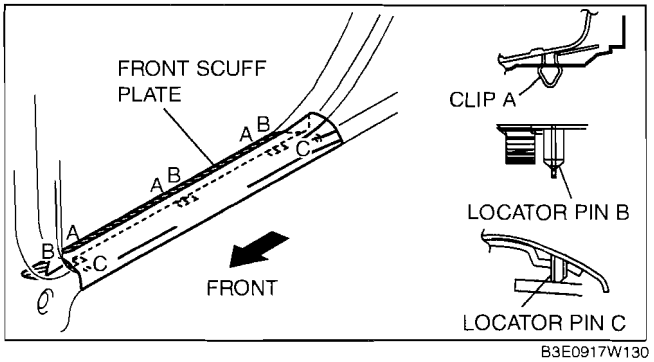


B3E0917W129

FRONT SCUFF PLATE REMOVAL/INSTALLATION

id091700801400

1. Pull the front scuff plate upward, detach clips A, locator pins B and C from the body, and then remove the front scuff plate.
2. Install in the reverse order of removal.

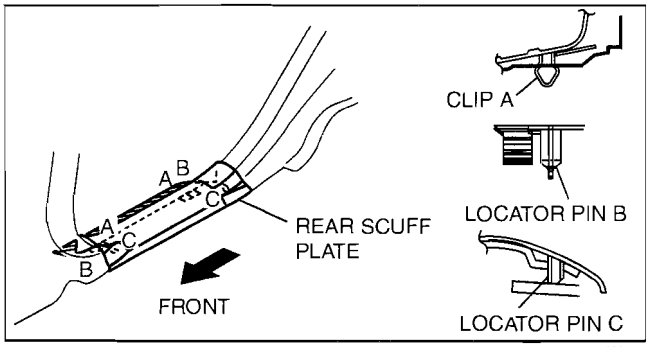


B3E0917W130

REAR SCUFF PLATE REMOVAL/INSTALLATION

id091700801500

1. Pull the rear scuff plate upward, detach clips A, locator pins B and C from the body, and then remove the rear scuff plate.
2. Install in the reverse order of removal.

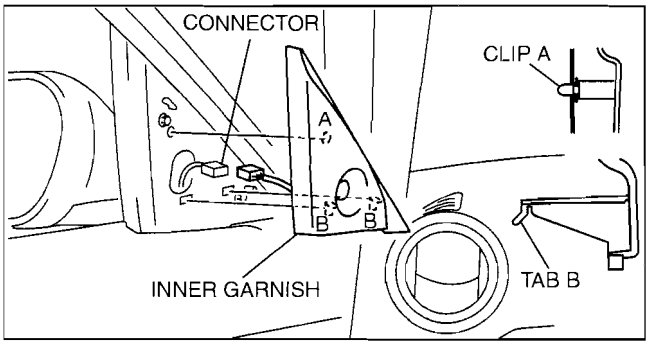


B3E0917W131

INNER GARNISH REMOVAL/INSTALLATION

id091700801000

1. Disconnect the negative battery cable.
2. Pull the inner garnish outward and detach clip A.
3. Disconnect the connector.
4. Detach the tabs B and remove the inner garnish.
5. Install in the reverse order of removal.

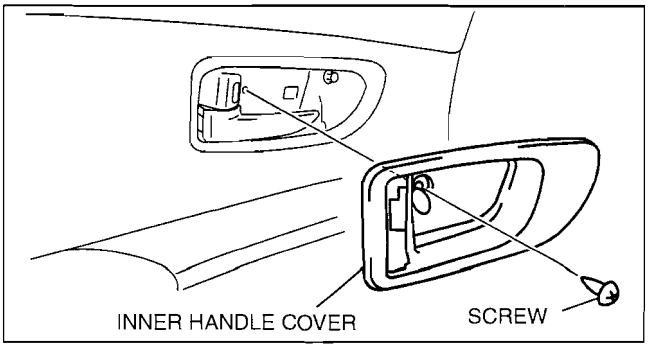


B3E0917W117

FRONT DOOR TRIM REMOVAL/INSTALLATION

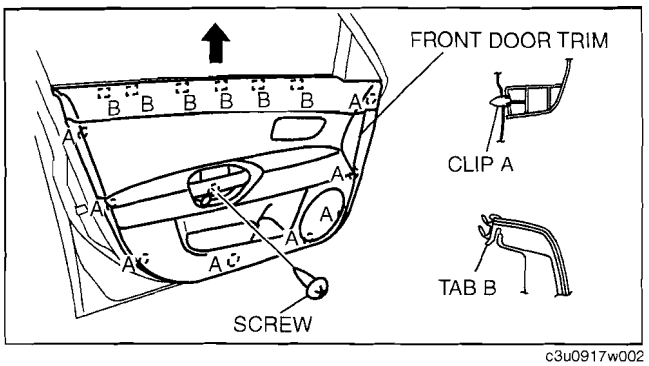
id091700802500

1. Disconnect the negative battery cable. (Vehicle with power window system or power outer mirror)
2. Using a small flathead screwdriver, open the cap and remove the screw, then remove the inner handle cover.
3. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicle without power window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)



c3u0917w115

5. Using a small flathead screwdriver, open the cap and remove the screw.
6. Detach clips A from the front door using a fastener remover.
7. Pull the front door trim upward and detach tabs B from the front door.
8. Disconnect the power window main switch connector and power outer mirror switch connector (LH). (Vehicle with power window system or power outer mirror)
9. Disconnect the power window subswitch connector (RH). (Vehicle with power window system)
10. Remove the front door trim.
11. Install in the reverse order of removal.

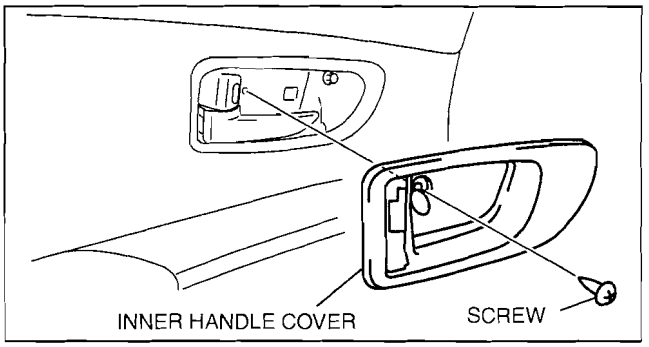


c3u0917w002

REAR DOOR TRIM REMOVAL/INSTALLATION

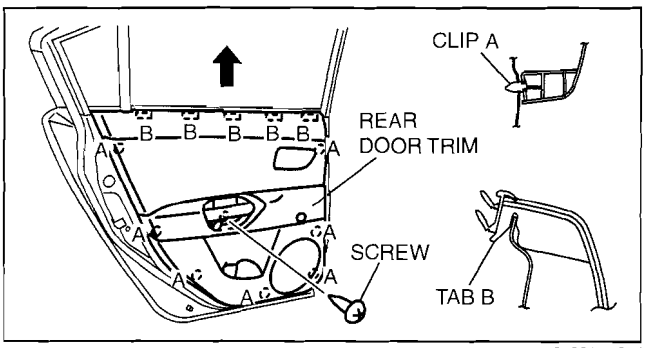
id091700802600

1. Disconnect the negative battery cable. (Vehicle with power window system)
2. Using a small flathead screwdriver, open the cap and remove the screw, then remove the inner handle cover.
3. Remove the sail garnish. (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
4. Remove the regulator handle. (Vehicle without power window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)



c3u0917w115

5. Using a small flathead screwdriver, open the cap and remove the screw.
6. Detach clips A from the front door using a fastener remover.
7. Pull the rear door trim upward and detach tabs B from the rear door.
8. Disconnect the power window subswitch connector. (Vehicle with power window system)
9. Remove the rear door trim.
10. Install in the reverse order of removal.



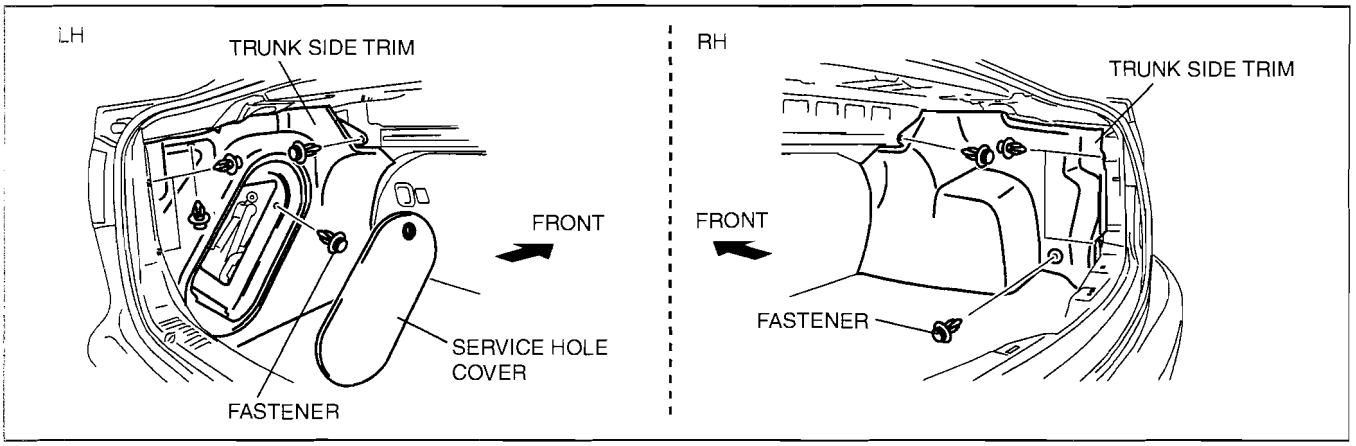
c3u0917w003

TRUNK SIDE TRIM REMOVAL/INSTALLATION

id091700803100

4 Door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (5) Service hole cover (LH)
2. Remove the fasteners, then remove the trunk side trim.

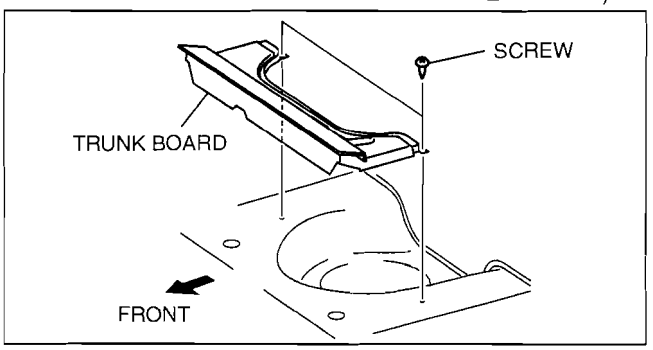


c3u0917w001

3. Install in the reverse order of removal.

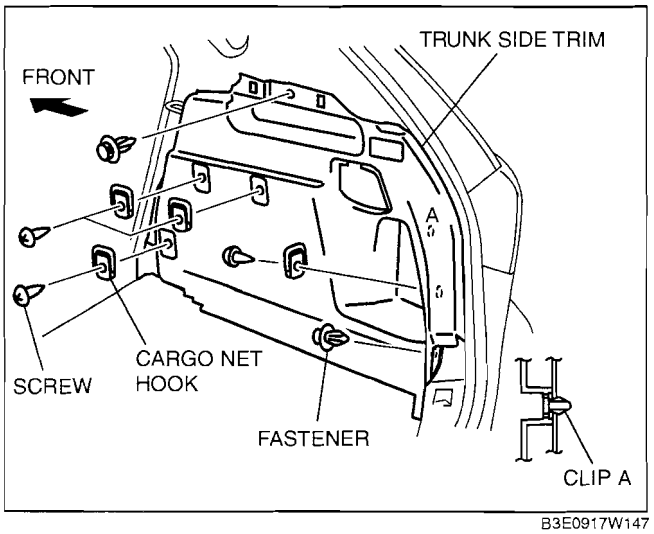
5 Door

1. Remove the following parts:
   (1) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (2) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (4) Trunk end trim (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
   (5) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (6) Cargo compartment light (See 09-18-25 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION.)
2. Remove the screws, then remove the trunk board.



B3E0917W157

3. Remove the screws, then remove the cargo net hooks.
4. Remove the fasteners.
5. Detach the clip A and remove the trunk side trim.
6. Install in the reverse order of removal.

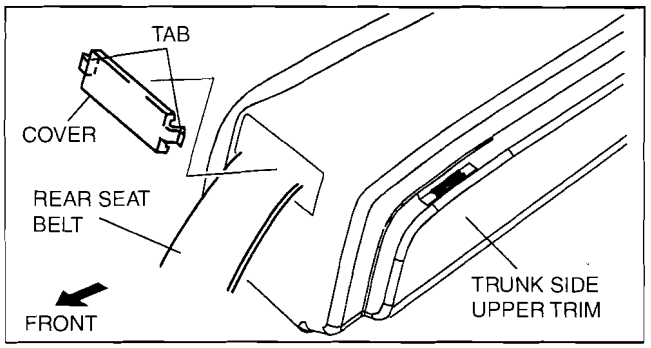


B3E0917W147

TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION

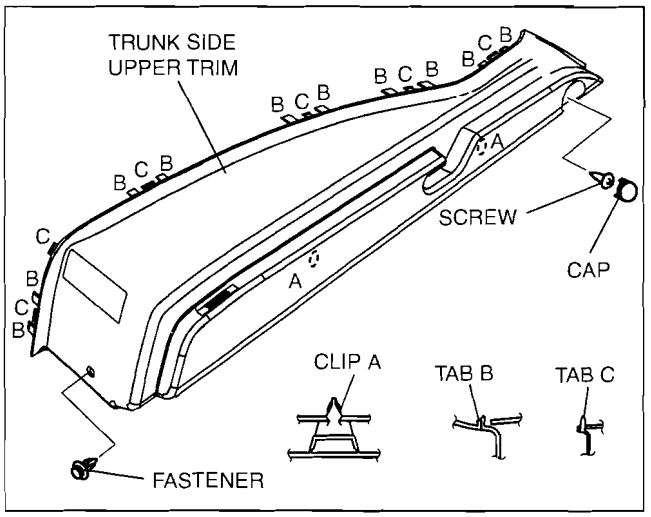
id091700803200

1. Disconnect the negative battery cable. (RH only)
2. Remove the rear seat belt lower bolt.
3. Detach the tabs and remove the cover from the trunk side upper trim.



c3u0917w160

4. Remove the cap and remove the screw.
5. Remove the fastener.
6. Pull the trunk side upper trim outward, then disengage tabs B and C from the C-pillar trim.
7. Pull the trunk side upper trim outward, then disengage clips A from the body.
8. Install in the reverse order of removal.

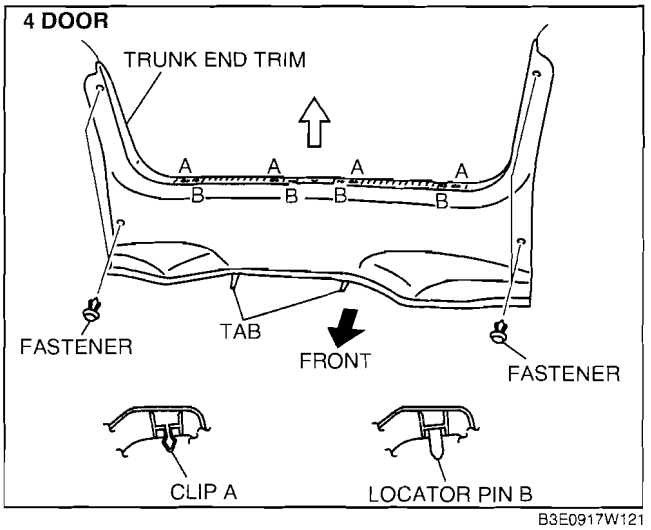


c3u0917w148

TRUNK END TRIM REMOVAL/INSTALLATION

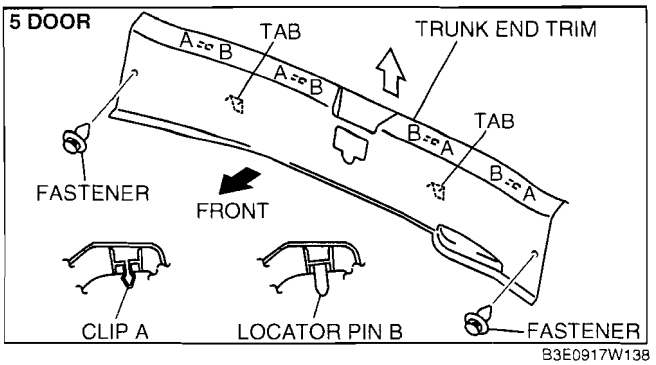
id091700803400

1. Remove the fasteners.



B3E0917W121

2. Pull the trunk end trim upward, then detach clips A, locator pins B and tabs.
3. Remove the trunk end trim.
4. Install in the reverse order of removal.

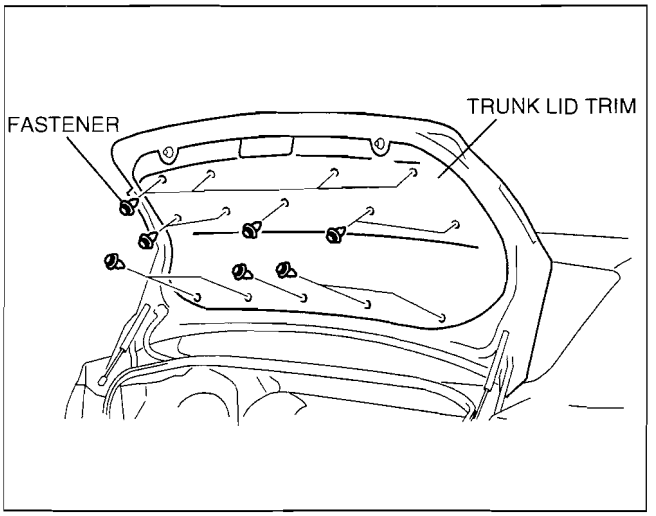


B3E0917W138

TRUNK LID TRIM REMOVAL/INSTALLATION

id091700803500

1. Remove the fasteners, then remove the trunk lid trim.
2. Install in the reverse order of removal.

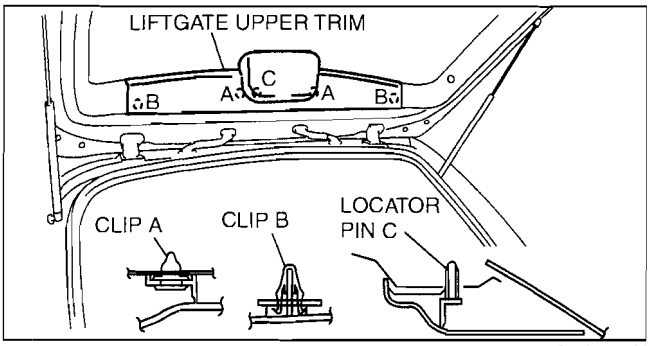


B3E0917W119

LIFTGATE UPPER TRIM REMOVAL/INSTALLATION

id091700803600

1. Pull the liftgate upper trim outward, then detach the clips A, B and the locator pin C from the liftgate.
2. Remove the liftgate upper trim.
3. install in the reverse order of removal.

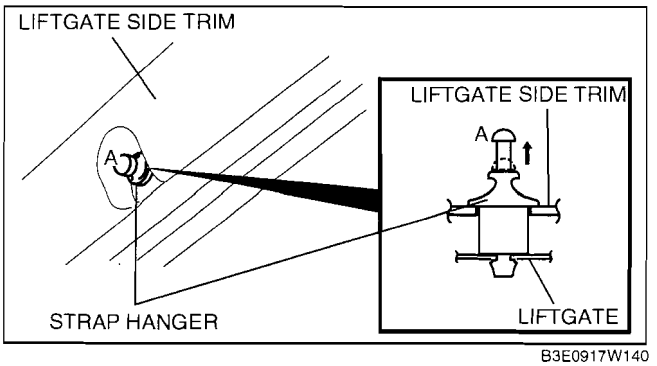


c3u0917w122

LIFTGATE SIDE TRIM REMOVAL/INSTALLATION

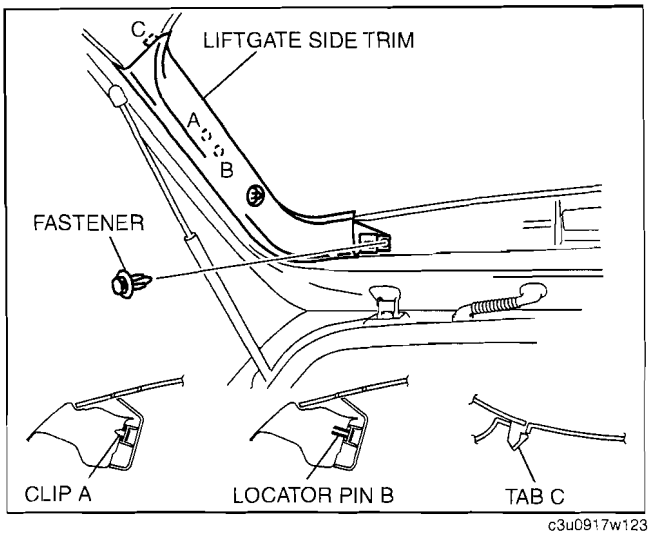
id091700803700

1. Remove the liftgate upper trim. (See09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
2. Pull the point A of the strap hanger as shown in the figure.
3. Remove the strap hanger.



B3E0917W140

4. Pull the liftgate side trim outward and detach clip A, locator pin B.
5. Detach the tab C and remove the liftgate side trim.
6. Install in the reverse order of removal.

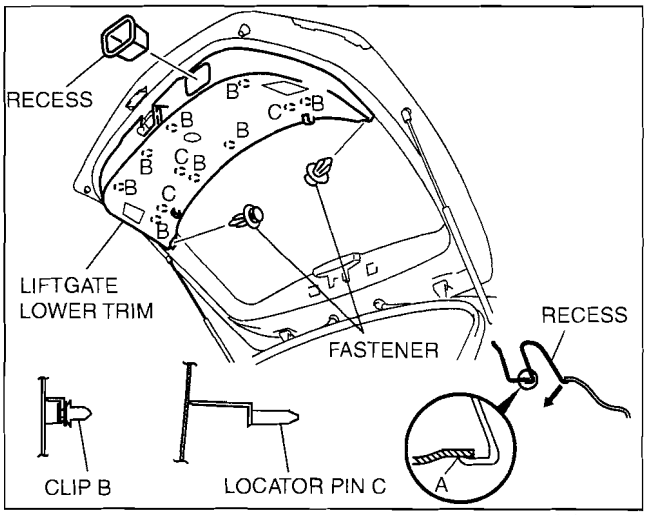


c3u0917w123

LIFTGATE LOWER TRIM REMOVAL/INSTALLATION

id091700803800

1. Remove the liftgate upper trim. (See09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
2. Remove the liftgate side trim. (See09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
3. While supporting at point A, pull the recess in the direction of the arrow and remove it.
4. Remove the fasteners.
5. Pull the liftgate lower trim outward, then detach clips B and locator pins C from the liftgate.
6. Remove the liftgate lower trim.
7. Install in the reverse order of removal.

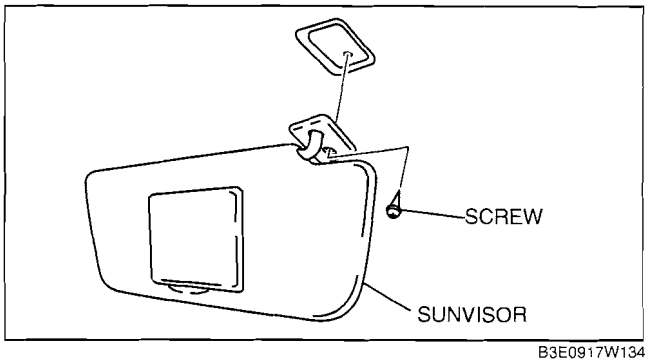


c3u0917w124

SUNVISOR REMOVAL/INSTALLATION

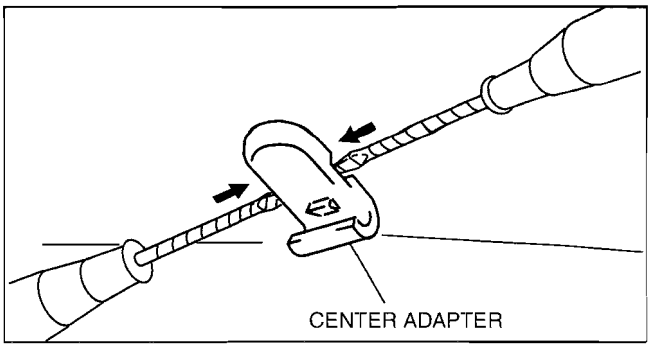
id091700801700

1. Remove the screw, then remove the sunvisor.



B3E0917W134

2. Press the center adapter tabs in the directions of the arrows using two tape-wrapped flathead screwdrivers and remove it.
3. Install in the reverse order of removal.

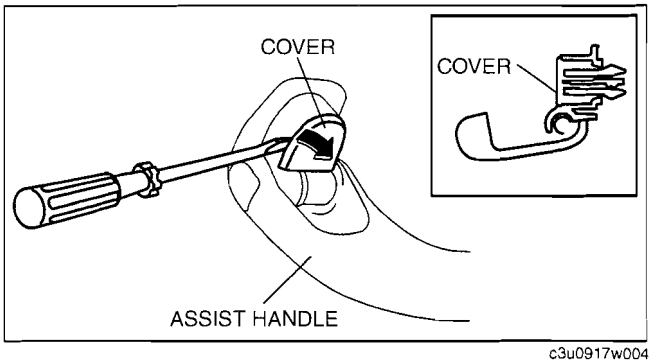


B3E0917W144

ASSIST HANDLE REMOVAL/INSTALLATION

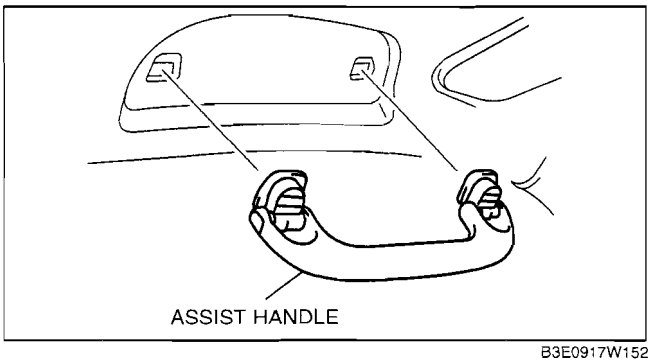
id091700801800

1. Insert a flathead screwdriver into the assist handle notch and remove the cover.



c3u0917w004

2. Pull the assist handle outward and remove it.
3. Install in the reverse order of removal.



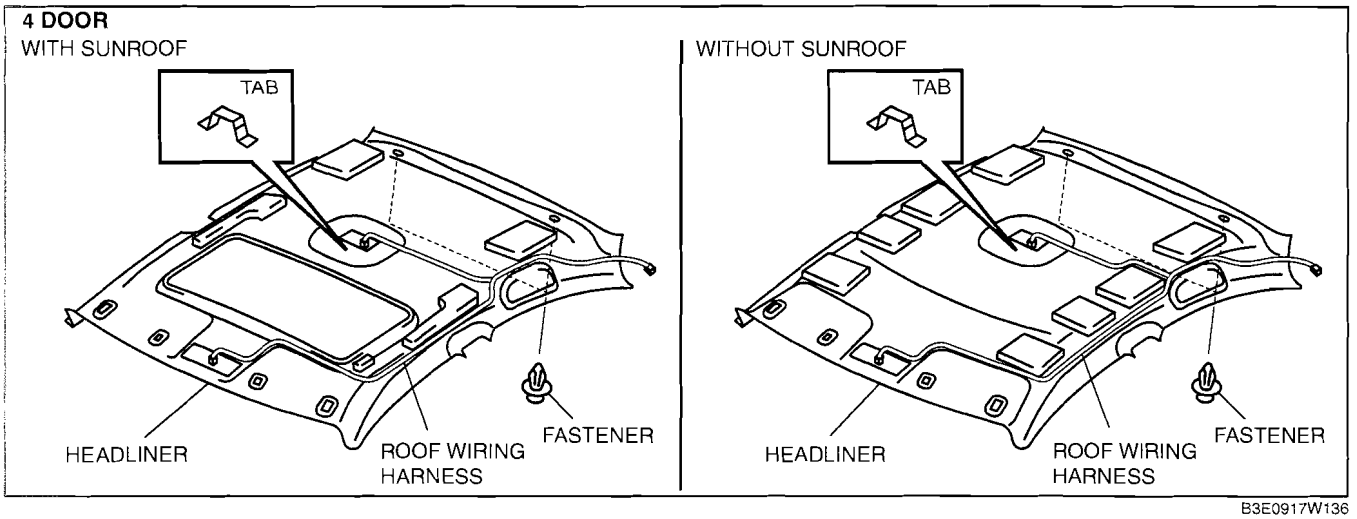
B3E0917W152

HEADLINER REMOVAL/INSTALLATION

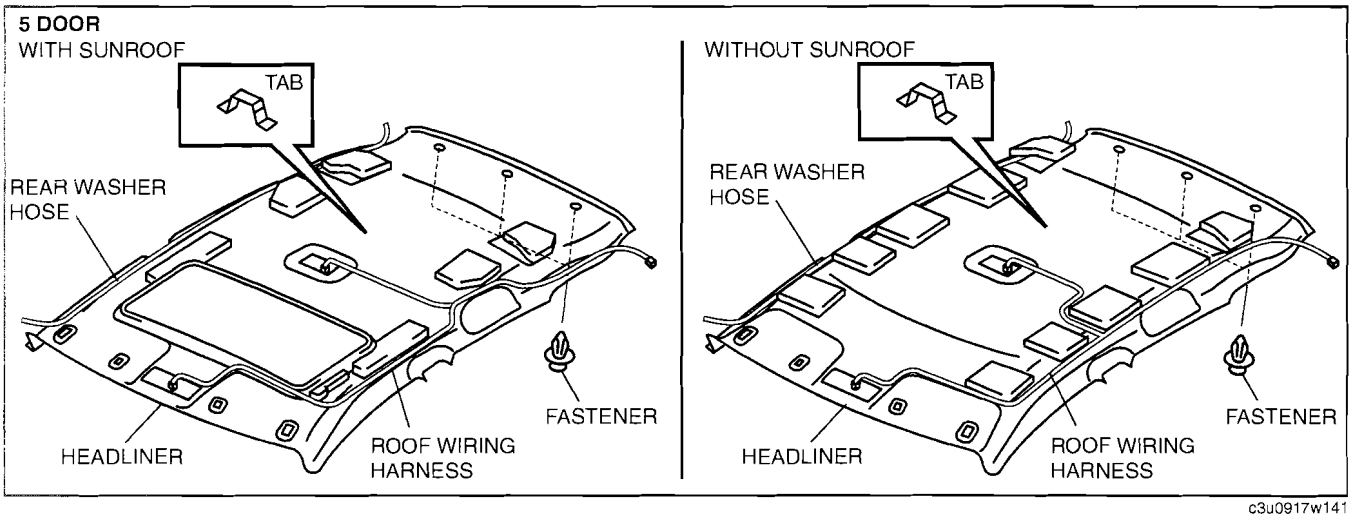
id091700801600

1. Shift to the D (ATX) or 4th gear (MTX) position. (4 door)
2. Disconnect the negative battery cable.
3. Partially peel back the seaming welts.
4. Remove the following parts:
   (1) Sunroof seaming welt (vehicles with sunroof)
   (2) Console (4 door) (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (3) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (4) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (5) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (7) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (8) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (9) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (10)Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (11)Trunk side upper trim (5 door) (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (12)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (13)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (14)Interior light (See 09-18-24 INTERIOR LIGHT REMOVAL/INSTALLATION.)
   (15)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (16)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
5. Disconnect the roof wiring harness connector and remove the roof wiring harness connector clip from the body.
6. Disconnect the rear washer hose. (5 door)

7. Remove the fasteners.

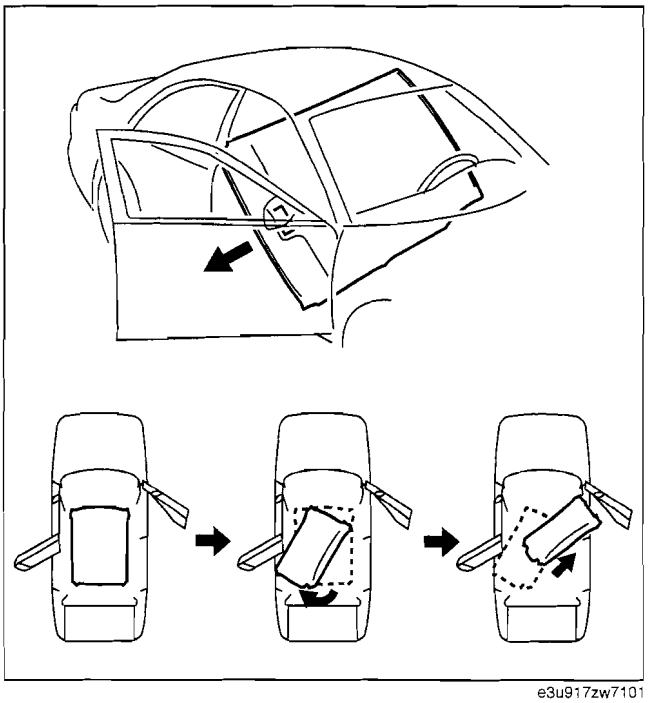


B3E0917W136



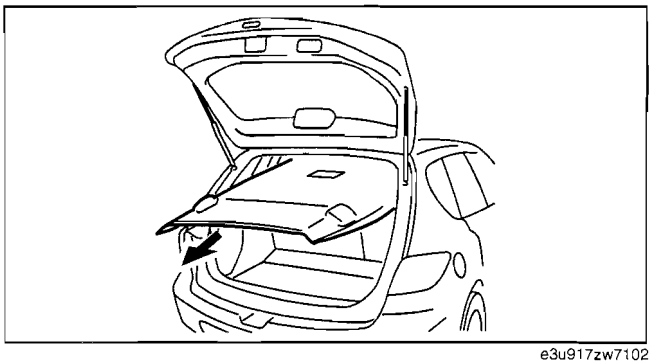
c3u0917w141

8. Detach the tab from the roof panel and remove the headliner.
9. Take the headliner out from the opened front passenger-side door. (4 door)



e3u917zw7101

10. Take the headliner out from the opened liftgate. (5 door)
11. Install in the reverse order of removal.

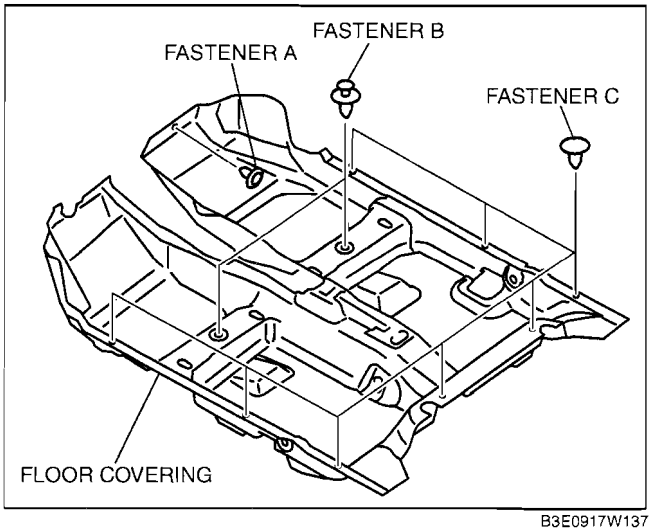


e3u917zw7102

FLOOR COVERING REMOVAL/INSTALLATION

id091700803000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front seat (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
   (2) Audio amplifier (BOSE) (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION.)
   (3) Woofer (BOSE) (See 09-20-10 WOOFER REMOVAL/INSTALLATION.)
   (4) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (5) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) Console (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (7) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (8) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (9) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (10)Lower anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (11)Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (12)Fuel-filler lid opener lever cover (See 09-14-15 FUEL-FILLER LID OPENER REMOVAL/INSTALLATION.)
   (13)Side wall (See 09-17-9 SIDE WALL REMOVAL/INSTALLATION.)
3. Remove fasteners A, B, and C.
4. Take the floor covering out from the opened door.
5. Install in the reverse order of removal.

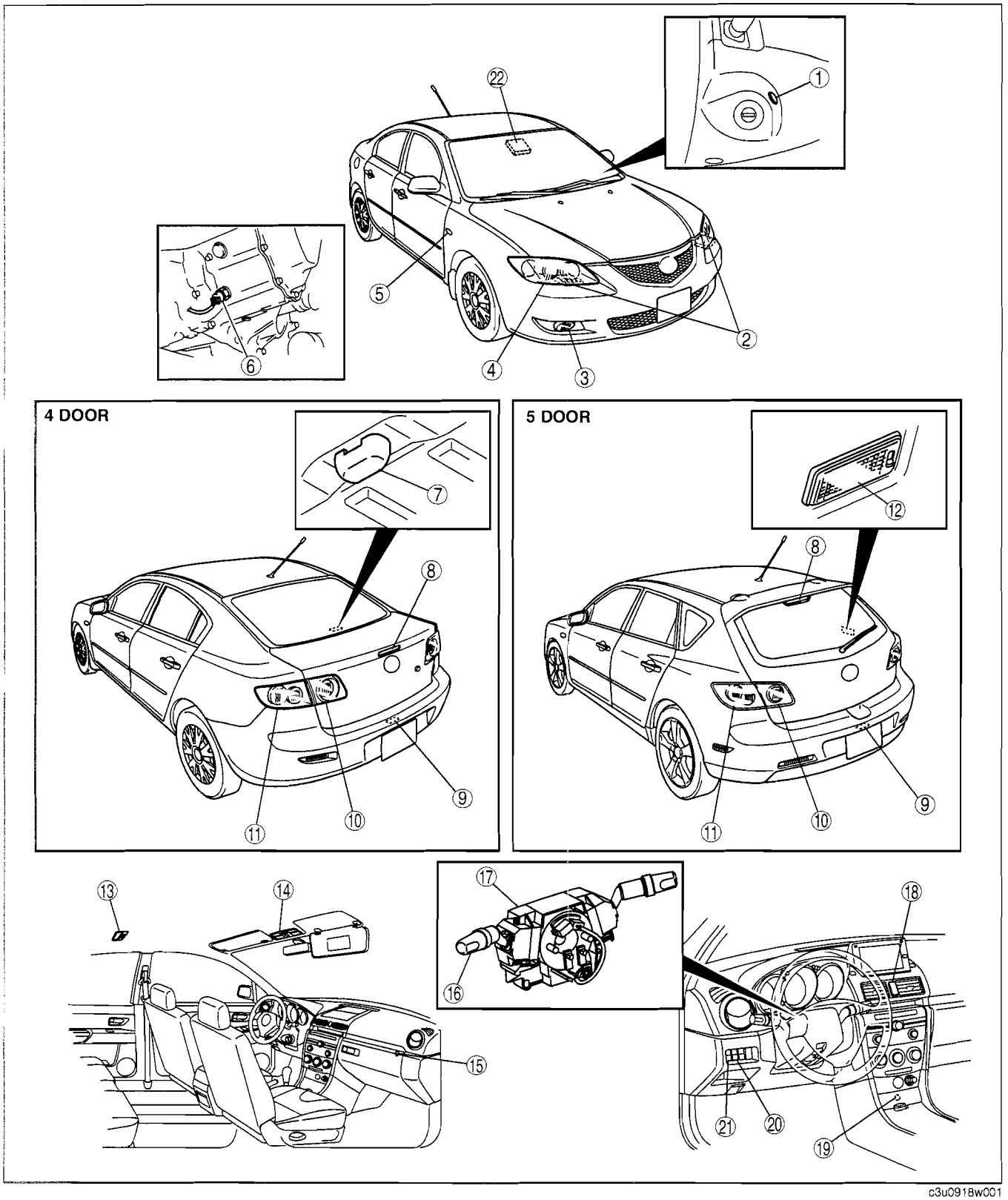


B3E0917W137

09-18 LIGHTING SYSTEMS

LIGHTING SYSTEMS LOCATION INDEX

id0918008001 00



c3u0918w001

1	Ignition key illumination (See 09-18-26 IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION.)

2	Discharge headlight control module (See 09-18-8 DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION.) (See 09-18-9 DISCHARGE HEADLIGHT SYSTEM INSPECTION.)

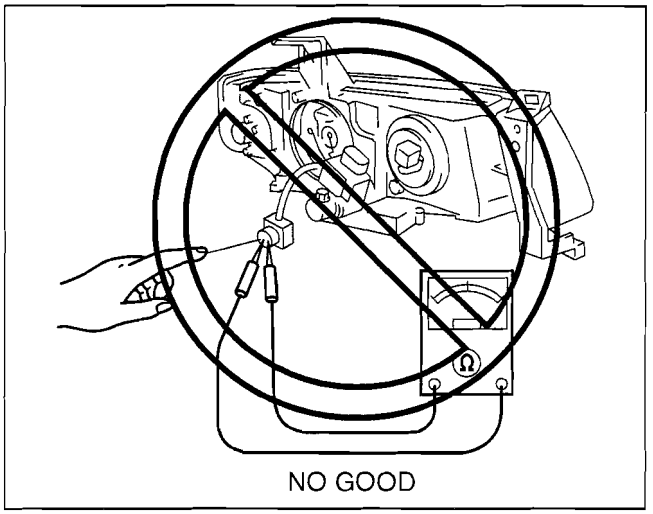
3	Front fog light (See 09-18-11 FRONT FOG LIGHT REMOVAL/INSTALLATION.) (See 09-18-13 FRONT FOG LIGHT AIMING.) (See 09-18-14 FRONT FOG LIGHT BULB REMOVAL/INSTALLATION.)
4	Front combination light (See 09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.) (See 09-18-6 HEADLIGHT AIMING.) (See 09-18-7 HEADLIGHT BULB REMOVAL/INSTALLATION.) (See 09-18-11 PARKING LIGHT BULB REMOVAL/INSTALLATION.) (See 09-18-11 FRONT TURN LIGHT BULB REMOVAL/INSTALLATION.) (See 09-18-4 DISCHARGE HEADLIGHT SERVICE WARNINGS.)
5	Front side turn light (See 09-18-14 FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION.)
6	Back-up light switch (MTX) (See 09-18-18 BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION.) (See 09-18-18 BACK-UP LIGHT SWITCH INSPECTION.)
7	Trunk compartment light (See 09-18-25 TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION.)
8	High-mount brake light (See 09-18-16 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION.)
9	License plate light (See 09-18-17 LICENSE PLATE LIGHT REMOVAL/INSTALLATION.)
10	Inboard light (See 09-18-15 INBOARD LIGHT REMOVAL/INSTALLATION.) (See 09-18-16 INBOARD LIGHT BULB REMOVAL/INSTALLATION.)
11	Rear combination light (See 09-18-14 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.) (See 09-18-15 REAR COMBINATION LIGHT BULB REMOVAL/INSTALLATION.)
12	Cargo compartment light (See 09-18-25 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION.) (See 09-18-25 CARGO COMPARTMENT LIGHT INSPECTION.)
13	Interior light (See 09-18-24 INTERIOR LIGHT REMOVAL/INSTALLATION.) (See 09-18-24 INTERIOR LIGHT INSPECTION.)
14	Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.) (See 09-18-23 MAP LIGHT INSPECTION.)
15	Glove compartment light (See 09-18-26 GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION.)
16	Light switch (See 09-18-20 LIGHT SWITCH REMOVAL/INSTALLATION.) (See 09-18-20 LIGHT SWITCH INSPECTION.) (See 09-18-21 FRONT FOG LIGHT SWITCH INSPECTION.)
17	Combination switch (See 09-18-19 COMBINATION SWITCH REMOVAL/INSTALLATION.) (See 09-18-19 COMBINATION SWITCH DISASSEMBLY/ASSEMBLY.)
18	Hazard warning switch (See 09-18-21 HAZARD WARNING SWITCH REMOVAL/INSTALLATION.) (See 09-18-21 HAZARD WARNING SWITCH INSPECTION.)
19	Ashtray illumination (See 09-18-25 ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION.)
20	Panel light control switch (See 09-18-26 PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION.) (See 09-18-27 PANEL LIGHT CONTROL SWITCH INSPECTION.)
21	Headlight leveling switch (See 09-18-22 HEADLIGHT LEVELING SWITCH REMOVAL/INSTALLATION.) (See 09-18-22 HEADLIGHT LEVELING SWITCH INSPECTION.)
22	Light sensor (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)

DISCHARGE HEADLIGHT SERVICE WARNINGS

id091800804900

DISCHARGE HEADLIGHT BULB SERVICE WARNINGS

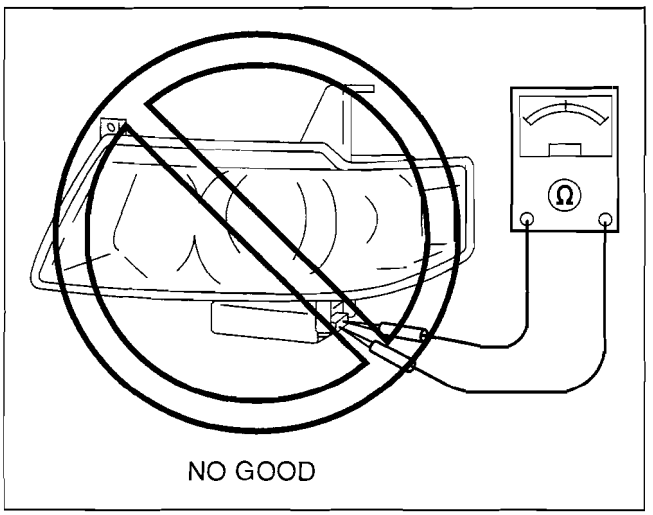
- To prevent electrical shock when replacing the discharge headlight bulb, dry hands thoroughly, and perform the work in an area out of rain.
- When the light switch is on, approx. 25,000 V of high voltage passes through the discharge headlight bulb socket. Because of the danger of electrical shock, do not insert fingers or a tester.
- When the headlights are on, high voltage flows around the socket and bulb. When turning on the discharge headlights while working, always leave the headlights in the vehicle-installed condition to prevent electrical shock.



bhe0918w172

DISCHARGE HEADLIGHT CONTROL MODULE SERVICE WARNINGS

- Because of the danger of electrical shock, when inspecting with a tester, do not inspect the discharge headlight control module as a single unit or disassemble it.



bhe0918w173

DISCHARGE HEADLIGHT CONTROL MODULE REUSE

- If the discharge headlight control module is dented or damaged in any way, replace the module with a new one to prevent electrical shock and improper operation.
- Although the control module may temporarily operate normally even though it has received an impact, it is possible that the interior may have been damaged. When reusing the control module, inspect the following items regarding discharge headlight illumination to verify that there are no malfunctions.
  - — Verify that the discharge headlights illuminate normally by testing them several times under cold illumination (headlights off for approx. 10 min or more and then turned on) and hot illumination (headlights on for approx. 15 min or more, turned off for approx. 1 min, and then turned on again) conditions.
  - — Inspect the headlight illumination in the period from directly after cold illumination until they are uniformly illuminated (approx. 5 min) and verify that there is no flickering or inconsistent brightness.
  - — Turn on the headlights for approx. 30 min with normal condition bulbs and verify that there is no brightness difference between the right and left, and that illumination is consistent.

FRONT COMBINATION LIGHT REMOVAL/INSTALLATION

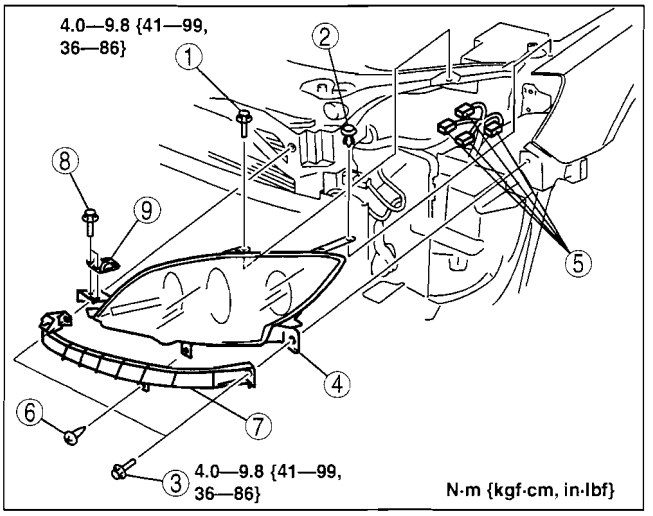
id091800800700

Warning

- **Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See 09-18-4 DISCHARGE HEADLIGHT SERVICE WARNINGS.)**

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Bolt A
2	Fastener
3	Bolt B
4	Front combination light
5	Connector
6	Bolt C
7	Cover
8	Bolt D (Mazdaspeed3)
9	Bracket (Mazdaspeed3)



am3uuw0000006

4. Install in the reverse order of removal.
5. Adjust the headlight aiming. (See09-18-6 HEADLIGHT AIMING)

FRONT COMBINATION LIGHT BRACKET REPLACEMENT

id091800800800

Note

- Verify that the front combination light is not damaged before using the repair bracket for installation when the original brackets are damaged. If the front combination light component is damaged, replace the light as a single unit.

1. Cut off the front combination light brackets at the locations shown in the figure.

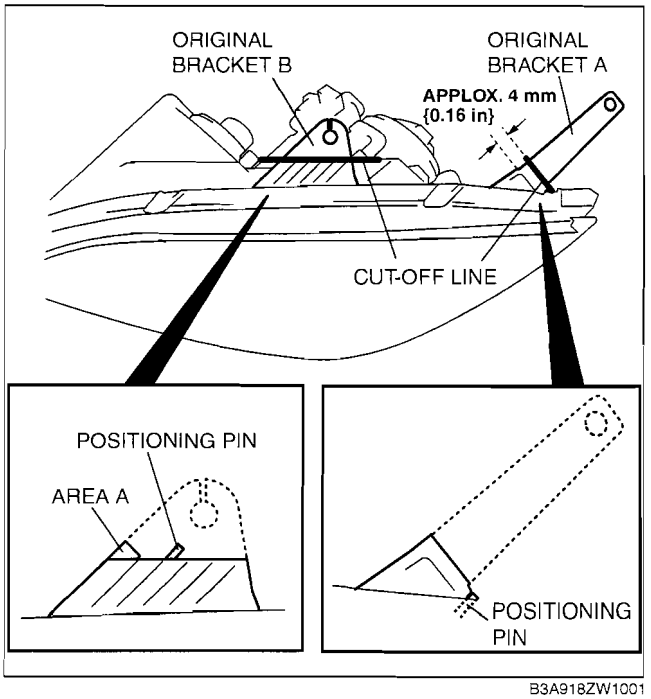
Caution

- **Be careful that area A shown in the figure (screw installation hole) and the positioning pins are not cut off.**

Note

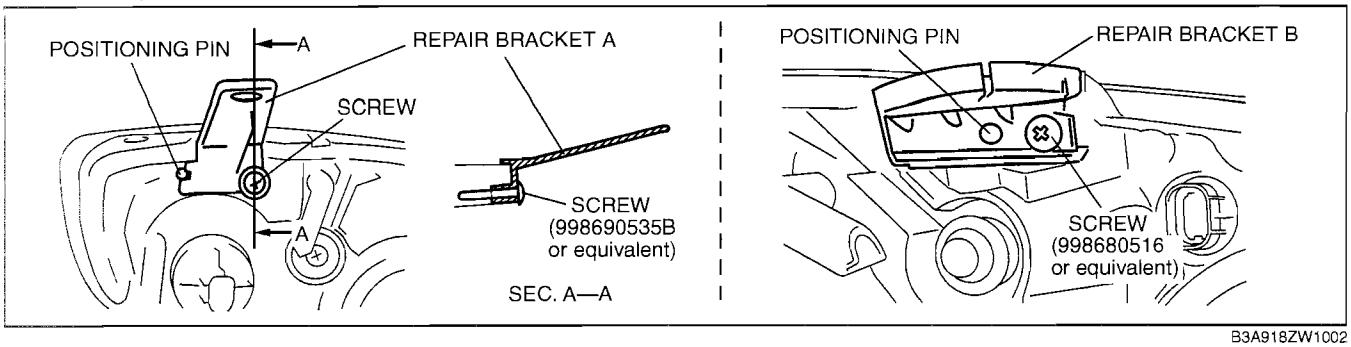
- After roughly cutting off the brackets, position the repair bracket using the positioning pins, and gradually smoothen any rough areas to create a shape that facilitates installation.

2. Smoothen the cut surfaces using sandpaper so that the repair bracket can be properly installed.



B3A918ZW1001

3. Securely attach the repair bracket to the front combination light using the screws.

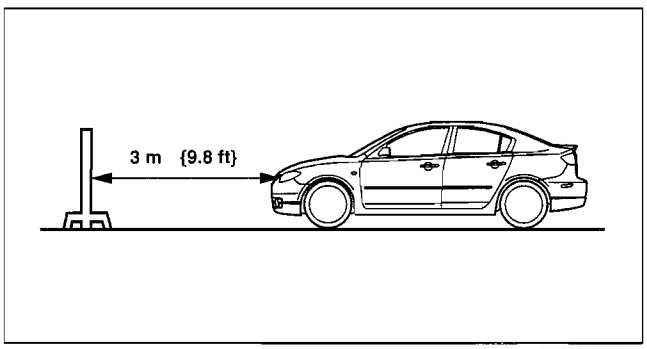


B3A918ZW1002

HEADLIGHT AIMING

id091800800400

1. Adjust the tire pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle straight ahead and perpendicular to the white screen.
5. Set the headlights **3 m {9.8 ft}** from the white screen.
6. Place an object in front of the headlight not being adjusted to block its light beam.
7. Start the engine so that the battery remains charged.
8. Turn on the low-beam headlight.
9. Set the headlight leveling switch to the 0 position. (Vehicles with discharge headlights)

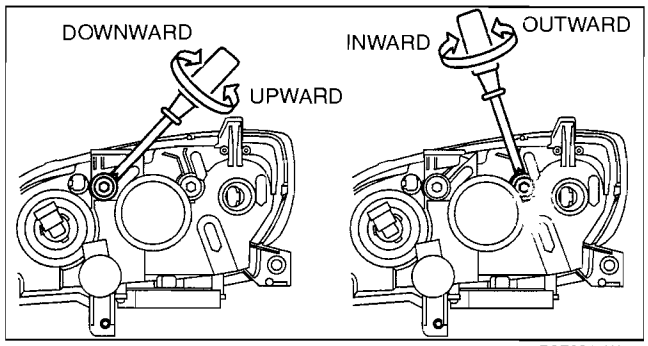


B3E0918W103

10. Adjust the headlight by loosening the adjusting screws as shown in the figure.

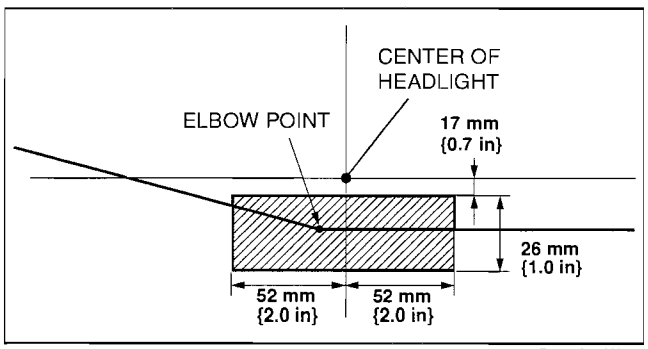
Note

- If the adjusting screws are tightened first, then loosened, they will continue to loosen when the vehicle is in motion and may cause the headlights to become misaligned. Always turn the screws in the tightening direction.



B3E0918W104

11. Turn the adjusting screws to adjust the headlight so that the elbow point is in the shaded area shown in the figure.



B3E0918W174

HEADLIGHT BULB REMOVAL/INSTALLATION

id091800800500

Low-beam

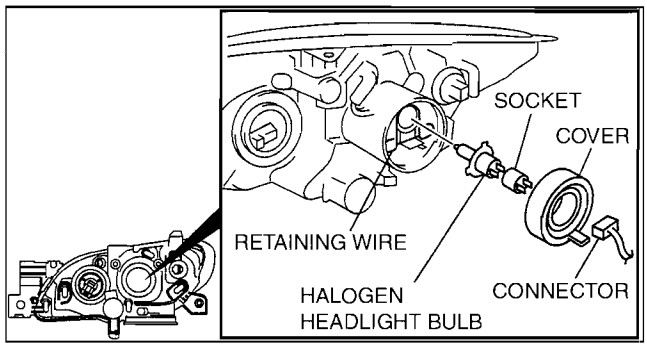
Halogen type

1. Disconnect the negative battery cable.
2. Disconnect the connector.

Caution

- **A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

3. Remove the cover.
4. Remove the socket, then remove the headlight bulb.
5. Install in the reverse order of removal.



B3E0918W105

Discharge type

Warning

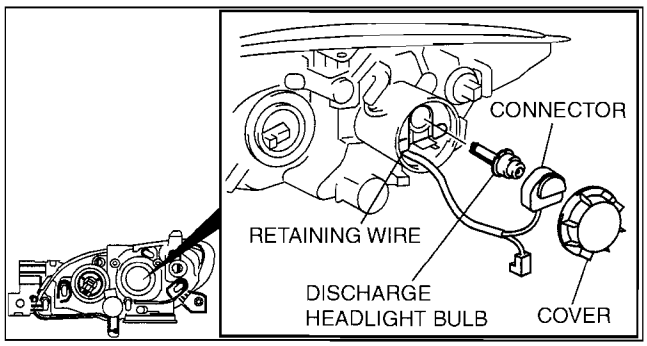
- **Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See 09-18-4 DISCHARGE HEADLIGHT SERVICE WARNINGS.)**

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove the front combination light. (See09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
4. Remove the cover.

Caution

- **The bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

5. Remove the connector, then remove the discharge headlight bulb.
6. Install in the reverse order of removal.



B3E0918W106

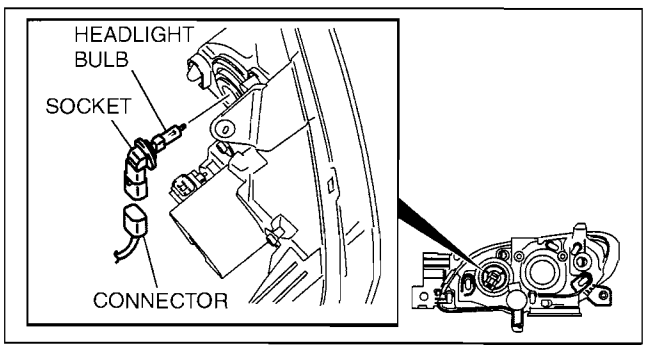
High-beam

1. Disconnect the negative battery cable.
2. Disconnect the connector.

Caution

- **A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

3. Remove the socket, then remove the headlight bulb.
4. Install in the reverse order of removal.



B3E0918W107

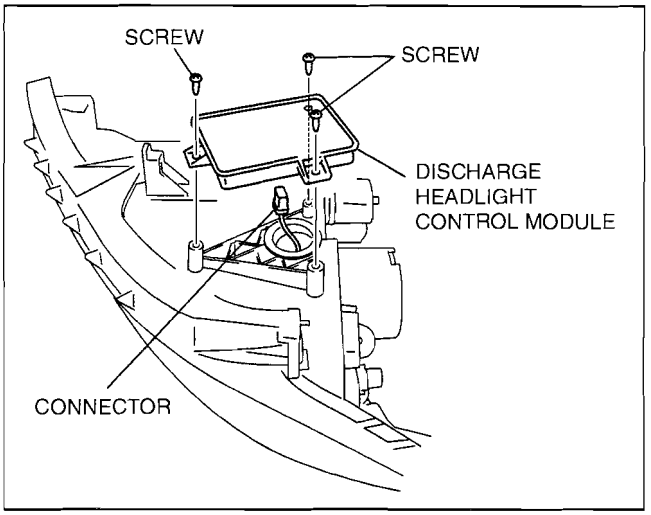
DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION

id091800805300

Warning

- **Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See 09-18-4 DISCHARGE HEADLIGHT SERVICE WARNINGS.)**

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See 09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Remove the front combination light. (See 09-18-5 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
4. Remove screws.
5. Disconnect the connector.
6. Remove the discharge headlight control module.
7. Install in the reverse order of removal.



b3e0918w108

DISCHARGE HEADLIGHT SYSTEM INSPECTION

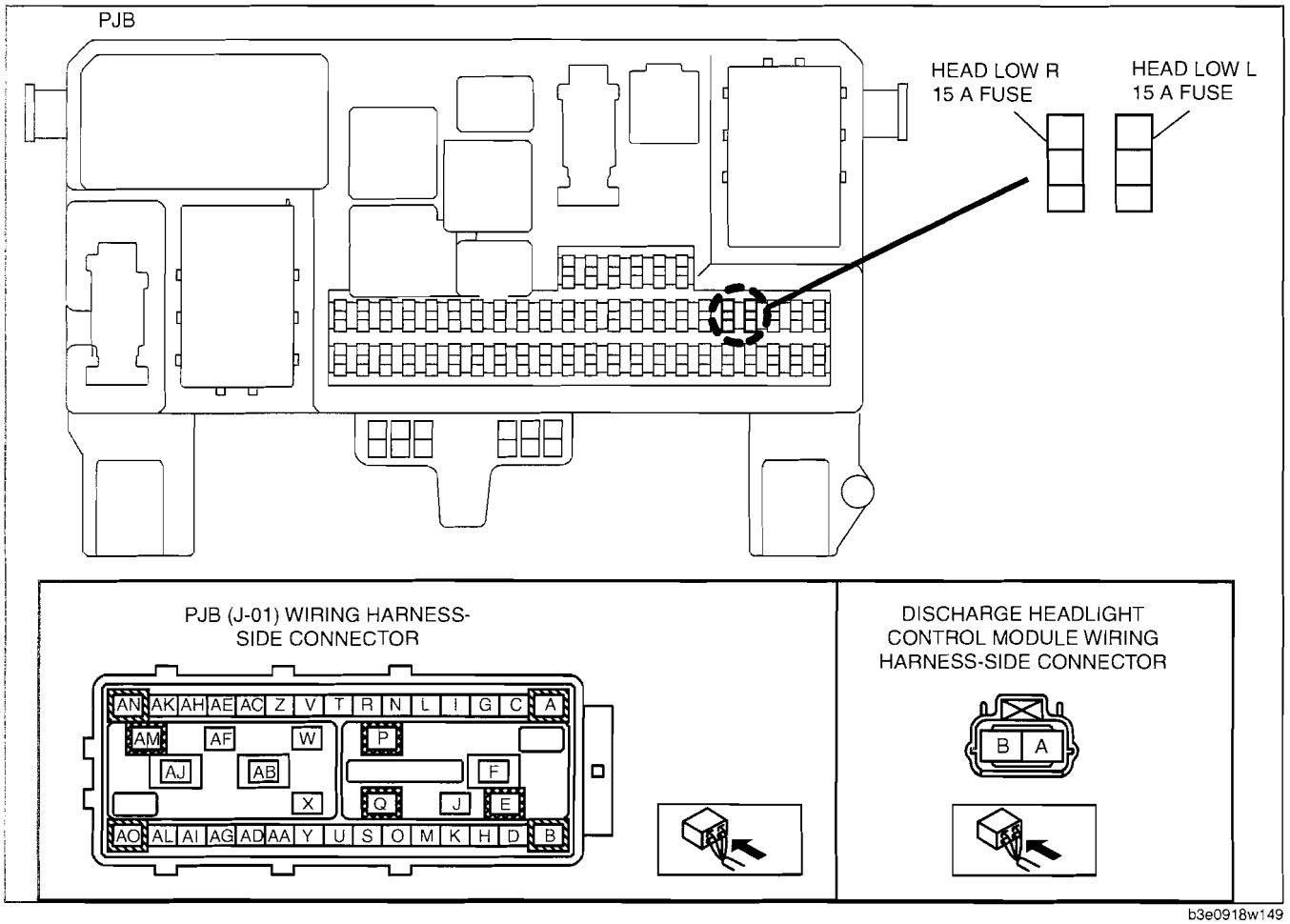
id091800805400

Discharge Headlight Inoperative

Warning

- **Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See 09-18-4 DISCHARGE HEADLIGHT SERVICE WARNINGS.)**

Terminal layout



b3e0918w149

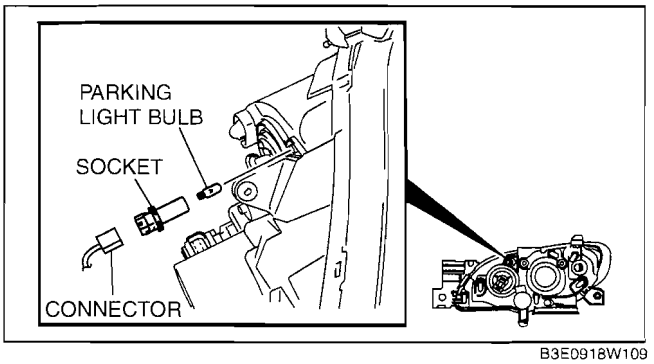
inspection procedure

STEP	INSPECTION		ACTION
1	**INSPECT POWER SUPPLY CIRCUIT OF DISCHARGE HEADLIGHT CONTROL MODULE** • Disconnect the discharge headlight control module connector. • Turn the headlight switch to the HEADLIGHT (LO) position. • Measure the voltage at discharge headlight control module terminal A (wiring harness-side). • Is the voltage **approx. 12 V**?	Yes	Go to Step 6.
		No	Go to the next step.
2	**INSPECT FUSE** • Turn the headlight switch to the OFF position. • Remove the HEAD LOW R 15 A fuse (RH) or HEAD LOW L 15 A fuse (LH). • Inspect the fuses. • Are the fuses normal?	Yes	Go to the next step.
		No	Replace the fuse.
3	**INSPECT HEADLIGHT RELAY** • Inspect the PJB. (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • Is the headlight relay normal?	Yes	Go to the next step.
		No	Replace the PJB. (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
4	**INSPECT LIGHT SWITCH** • Inspect the light switch. (See 09-18-20 LIGHT SWITCH INSPECTION.) • Is the light switch normal?	Yes	Go to the next step.
		No	Replace the light switch. (See 09-18-20 LIGHT SWITCH REMOVAL/INSTALLATION.)
5	**INSPECT WIRING HARNESS BETWEEN BATTERY AND DISCHARGE HEADLIGHT CONTROL MODULE** • Disconnect the negative battery cable. • Inspect for continuity between the following terminals: — Battery (positive terminal) and PJB (terminal J-01 AM) — HEAD LOW R 15 A fuse (RH) and discharge headlight control module terminal A — HEAD LOW L 15 A fuse (LH) discharge headlight control module terminal A • Are the wiring harnesses normal?	Yes	Go to the next step.
		No	Replace the related wiring harness.
6	**INSPECT WIRING HARNESS BETWEEN DISCHARGE HEADLIGHT CONTROL MODULE AND GROUND** • Inspect the wiring harness between discharge headlight control module terminal B and ground for the following: — Short to power supply — Open circuit • Is the wiring harness normal?	Yes	Go to the next step.
		No	Replace the related wiring harness.
7	**VERIFY WHETHER MALFUNCTION IS IN DISCHARGE HEADLIGHT BULB OR DISCHARGE HEADLIGHT CONTROL MODULE** • Install any other discharge headlight bulb (low-beam). (See 09-18-7 HEADLIGHT BULB REMOVAL/INSTALLATION.) • Connect the discharge headlight control module connector. • Turn the headlight switch to the HEADLIGHT (LO) position. • Does the headlight (low-beam) illuminate?	Yes	System inspection completed.
		No	Replace the discharge headlight control module. (See 09-18-8 DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION.)

PARKING LIGHT BULB REMOVAL/INSTALLATION

id091800804200

1. Disconnect the negative battery cable.
2. Disconnect the connector.
3. Remove the socket, then remove the parking light bulb.
4. Install in the reverse order of removal.

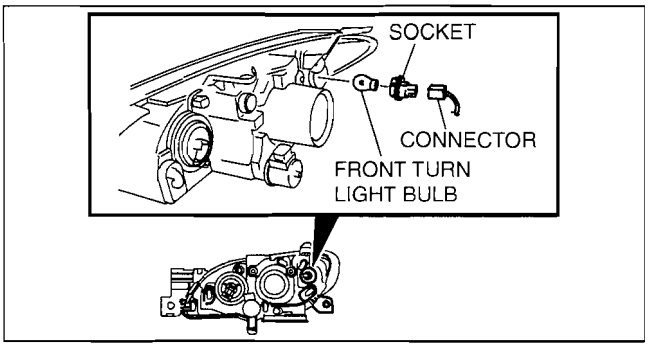


B3E0918W109

FRONT TURN LIGHT BULB REMOVAL/INSTALLATION

id091800805000

1. Disconnect the negative battery cable.
2. Remove the fasteners and slightly bend back the mudguard.
3. Disconnect the connector.
4. Remove the socket, then remove the front turn light bulb.
5. Install in the reverse order of removal.



B3E0918W110

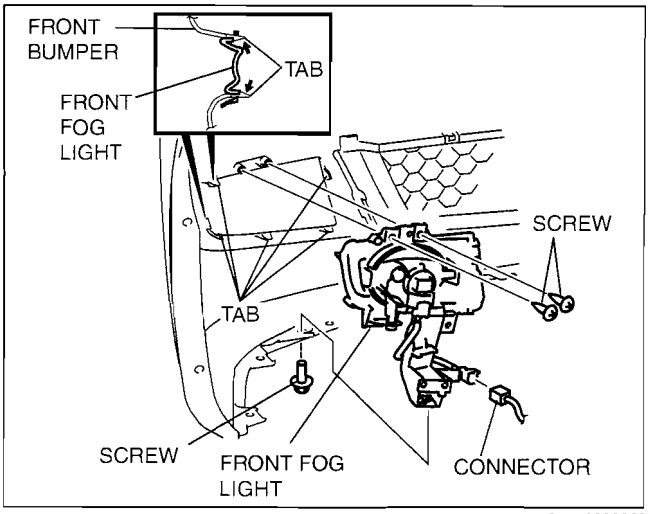
FRONT FOG LIGHT REMOVAL/INSTALLATION

id091800802100

4 DOOR

Standard type

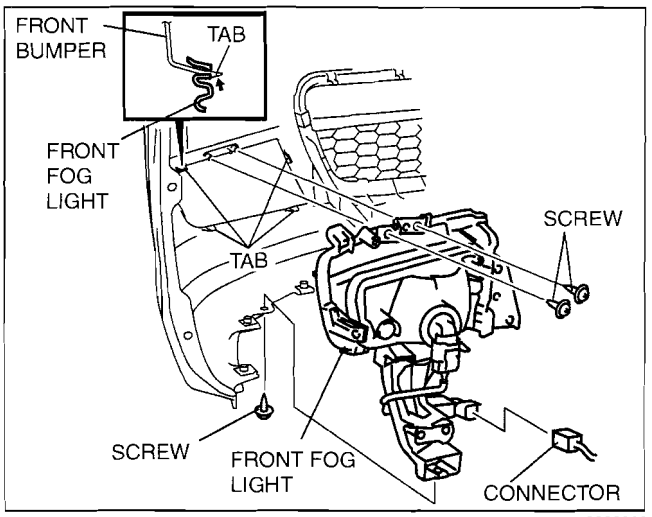
1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Slightly bend back the mudguard.
4. Disconnect the connector.
5. Remove the screws.
6. Remove tabs and then remove the front fog light.
7. Install in the reverse order of removal.
8. Adjust the front fog light aiming. (See 09-18-13 FRONT FOG LIGHT AIMING.)



am3zzw0000262

Sport Type

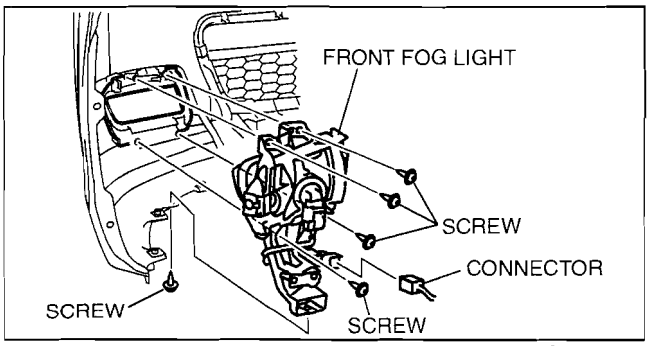
1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Slightly bend back the mudguard.
4. Disconnect the connector.
5. Remove the screws.
6. Remove tabs and then remove the front fog light.
7. Install in the reverse order of removal.
8. Adjust the front fog light aiming. (See 09-18-13 FRONT FOG LIGHT AIMING.)



am3zzw0000262

5 DOOR

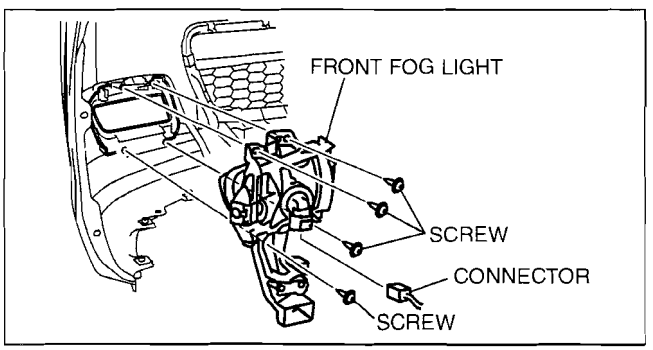
1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Slightly bend back the mudguard.
4. Disconnect the connector.
5. Remove the screws.
6. Remove the front fog light.
7. Install in the reverse order of removal.
8. Adjust the front fog light aiming. (See 09-18-13 FRONT FOG LIGHT AIMING.)



am3zzw0000183

Mazdaspeed3

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Slightly bend back the mudguard.
4. Disconnect the connector.
5. Remove the screws.
6. Remove the front fog light.
7. Install in the reverse order of removal.
8. Adjust the front fog light aiming. (See 09-18-13 FRONT FOG LIGHT AIMING.)

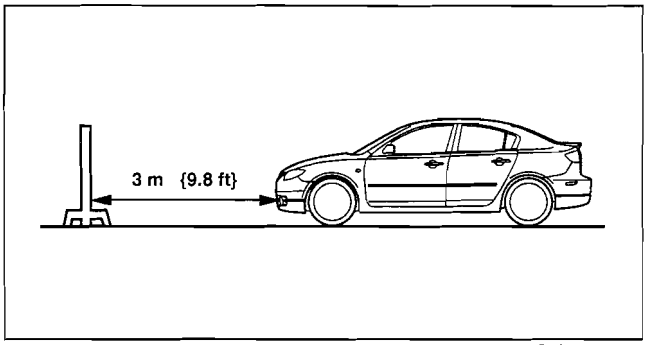


am3uuw0000086

FRONT FOG LIGHT AIMING

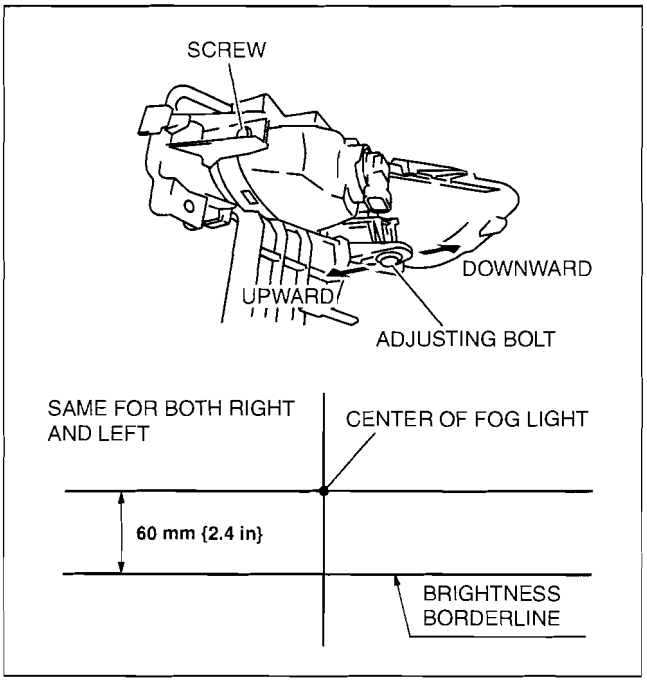
id091800802200

1. Adjust the tire pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle straight ahead and perpendicular to a white screen.
5. Set the fog lights **3 m {9.8 ft}** from the white screen.
6. Place an object in front of the fog light not being adjusted to block its light beam.
7. Start the engine so that the battery remains charged.
8. Turn the front fog lights on.
9. Loosen the screw and the adjusting bolt, move the front fog light in the direction of the arrows, and adjust the front fog light beam to the position shown in the figure.



B3E0918W113

10. Tighten the adjusting bolt, then tighten the screw.



c3u918zw7001

FRONT FOG LIGHT BULB REMOVAL/INSTALLATION

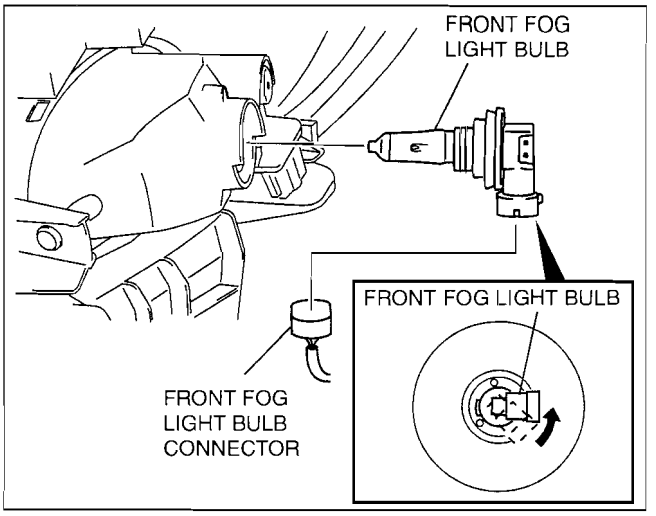
id091800802300

1. Disconnect the negative battery cable.
2. Slightly bend back the mudguard.
3. Disconnect the front fog light bulb connector and remove the front fog light bulb by turning it in the direction of the arrow.

Caution

- **A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When handling the bulb, hold the flange, not the glass.**

4. Install in the reverse order of removal.

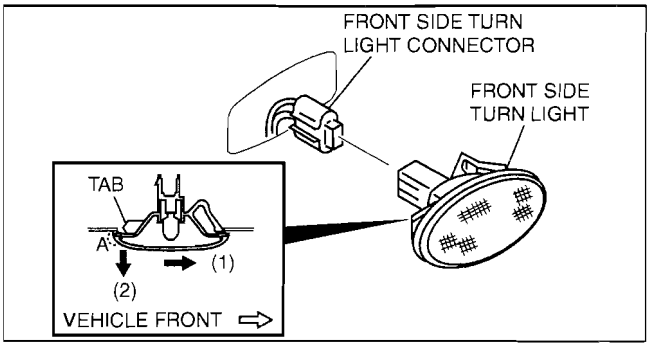


b3e0918w112

FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION

id091800800900

1. Disconnect the negative battery cable.
2. Move the front side turn light in the direction of the arrow (1) and detach the tab.
3. Pull area A of the front side turn light in the direction of the arrow (2) and remove the front side turn light.
4. Disconnect the front side turn light connector.
5. Install in the reverse order of removal.



B3E0918W115

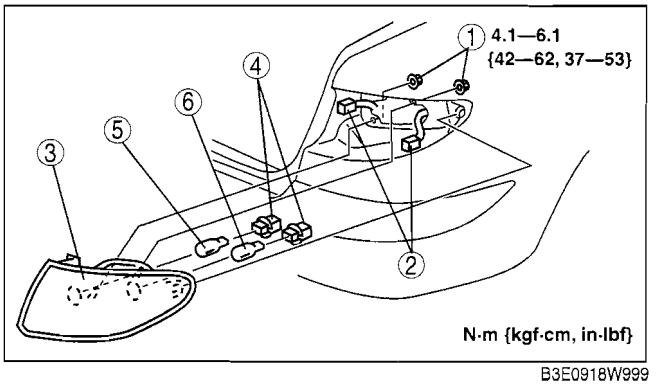
REAR COMBINATION LIGHT REMOVAL/INSTALLATION

id091800801000

1. Disconnect the negative battery cable.
2. Remove the trunk end trim. (4 door) (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
3. Remove the fasteners and slightly bend back the trunk side trim. (4 door)
4. Remove the service hole cover. (5 door)
5. Remove in the order indicated in the table.

1	Nut
2	Connector
3	Rear combination light
4	Socket
5	Rear turn light bulb
6	Brake light/taillight bulb

6. Install in the reverse order of removal.



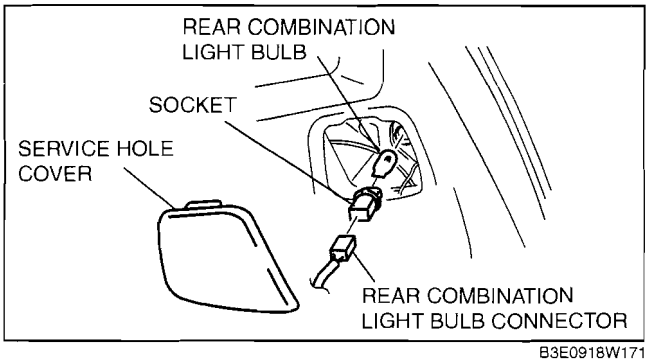
B3E0918W999

REAR COMBINATION LIGHT BULB REMOVAL/INSTALLATION

id091800805900

5 Door

1. Disconnect the negative battery cable.
2. Remove the service hole cover.
3. Disconnect the rear combination light bulb connector.
4. Remove the socket.
5. Remove the rear combination light bulb.
6. Install in the reverse order of removal.



B3E0918W171

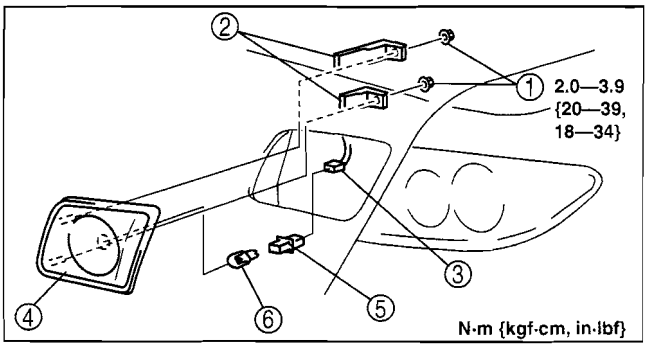
INBOARD LIGHT REMOVAL/INSTALLATION

id091800806100

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (4 door) (See09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Remove the service hole cover. (5 door)
4. Remove in the order indicated in the table.

1	Nut
2	Bracket
3	Connector
4	Inboard light (See 09-18-15 Inboard Light Installation Note.)
5	Socket
6	Back-up light bulb

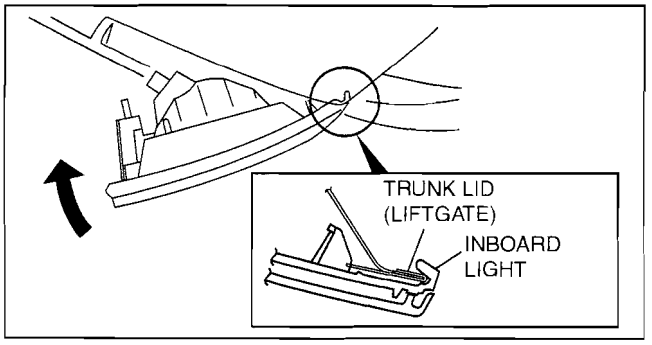
5. Install in the reverse order of removal.



b3e0918w117

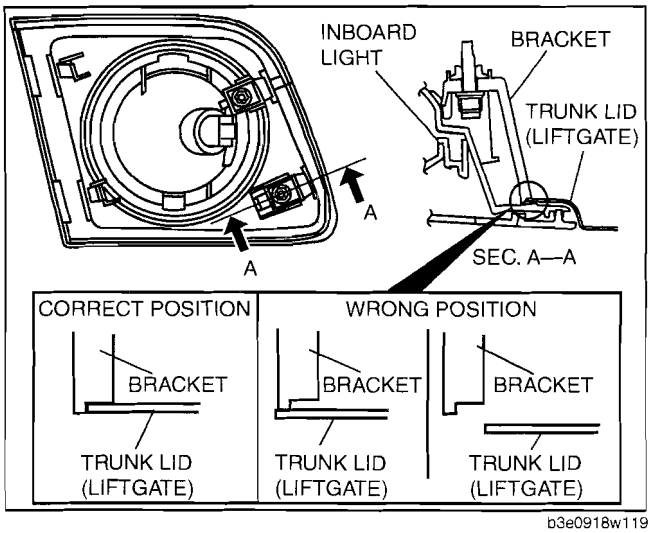
Inboard Light Installation Note

1. Insert the inboard light into the trunk lid (liftgate) as shown in the figure, then pivot it inward and fix in place.



am3uuw0000083

2. Push the bracket onto the trunk lid (liftgate) as shown in the figure and install.



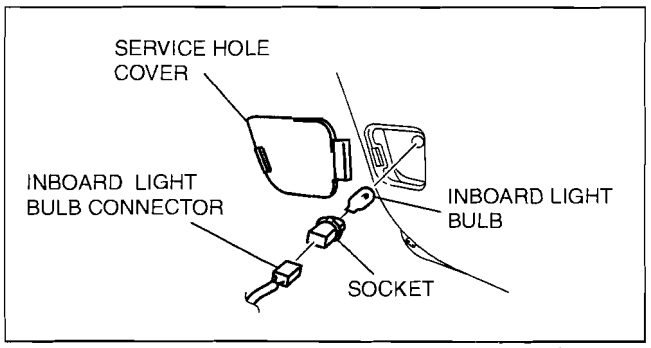
b3e0918w119

INBOARD LIGHT BULB REMOVAL/INSTALLATION

id091800806000

5 Door

1. Disconnect the negative battery cable.
2. Remove the service hole cover.
3. Disconnect the inboard light bulb connector.
4. Remove the socket.
5. Remove the inboard light bulb.
6. Install in the reverse order of removal.



c3u0918w170

HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION

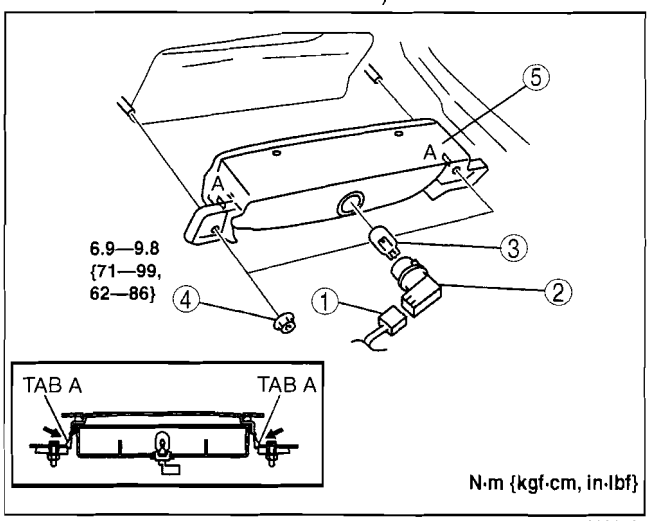
id091800802000

4 DOOR

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim. (See 09-17-22 TRUNK LID TRIM REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Socket
3	High-mount brake light bulb
4	Nut
5	High-mount brake light

4. Install in the reverse order of removal.



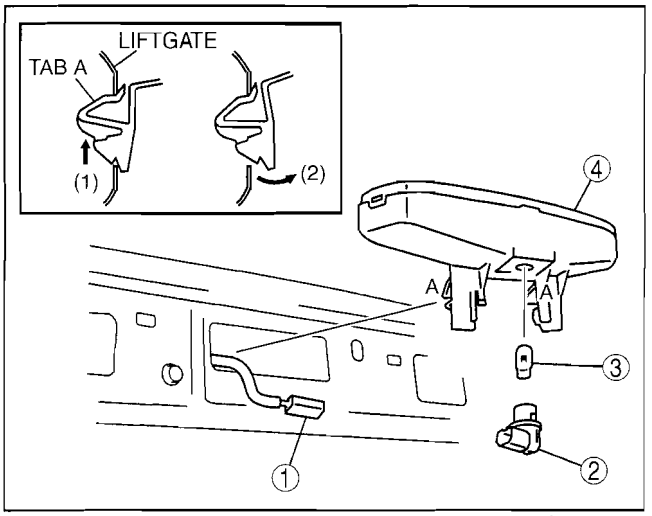
am3uuw0000007

5 DOOR

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Socket
3	High-mount brake light bulb
4	High-mount brake light

4. Install in the reverse order of removal.



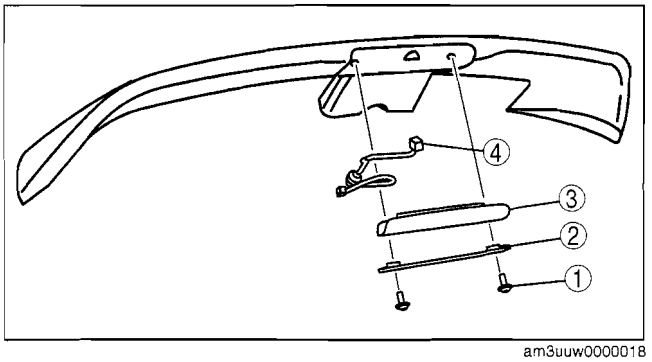
am3uuw0000007

Mazdaspeed3

1. Disconnect the negative battery cable.
2. To remove the wiring harness, remove the following parts.:
   - Liftgate upper trim (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
   - Rear spoiler (See 09-16-9 REAR SPOILER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Screw
2	Bracket
3	High-mount brake light
4	Connector

4. Install in the reverse order of removal.

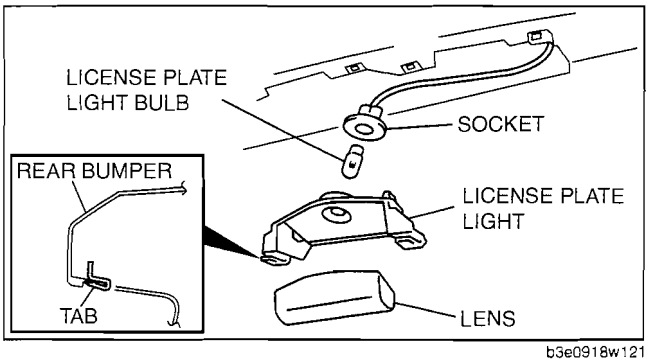


am3uuw0000018

LICENSE PLATE LIGHT REMOVAL/INSTALLATION

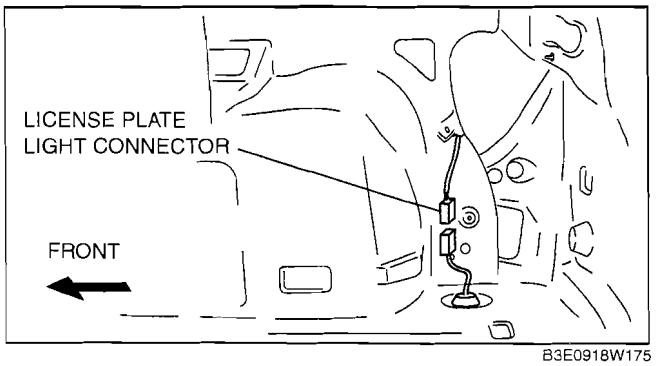
id091800801100

1. Disconnect the negative battery cable.
2. Remove the lens, then remove the license plate light bulb.
3. Remove the license plate light from the rear bumper.
4. Remove the trunk end trim. (See 09-17-21 TRUNK END TRIM REMOVAL/INSTALLATION.)
5. Remove the fasteners and slightly bend back the trunk side trim (RH).
6. Remove the fasteners and slightly bend back the trunk side trim (LH). (4 door)
7. Remove the service hole cover (LH). (5 door)
8. Remove the rear combination light. (See 09-18-14 REAR COMBINATION LIGHT REMOVAL/INSTALLATION.)



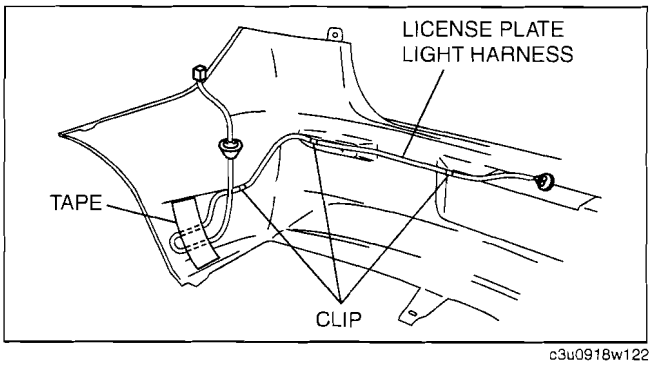
b3e0918w121

9. Disconnect the license plate light connector.
10. Remove the rear bumper. (See 09-10-15 REAR BUMPER REMOVAL/INSTALLATION.)



B3E0918W175

11. Detach the clips from the rear bumper.
12. Remove the license plate light harness and tape.
13. Install in the reverse order of removal.

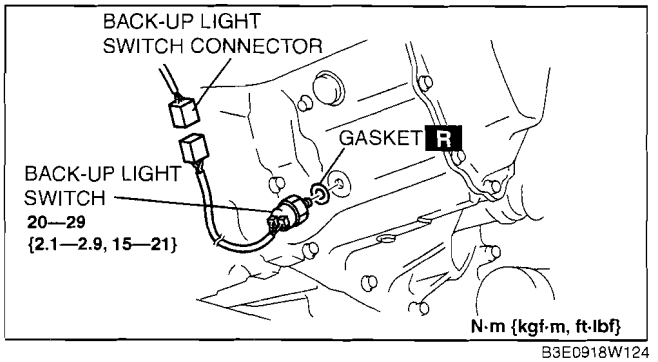


c3u0918w122

BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION

id091800800200

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the back-up light switch connector and remove the back-up light switch.
4. Install in the reverse order of removal.



B3E0918W124

BACK-UP LIGHT SWITCH INSPECTION

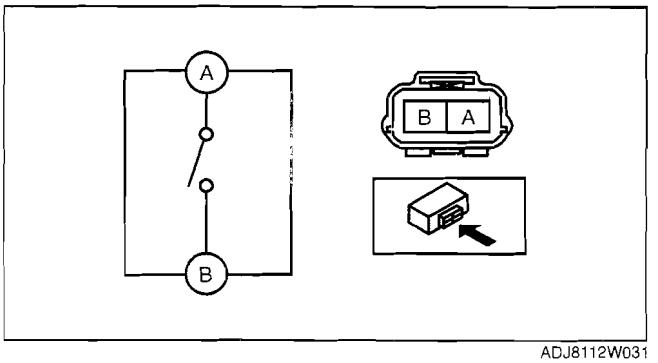
id091800800300

1. Verify that the continuity between the back-up light switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the back-up light switch.

O—O : Continuity

Shift lever position	Terminal	
	A	B
Reverse	O	O
Except above		

B3E0918W164



ADJ8112W031

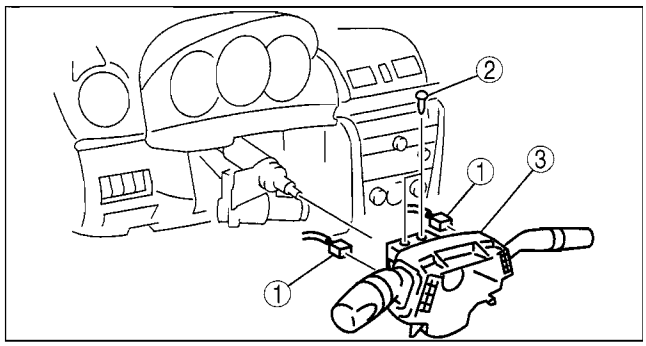
COMBINATION SWITCH REMOVAL/INSTALLATION

id091800802500

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Driver-side air bag module (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
   (2) Steering wheel (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
   (3) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (4) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (5) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (6) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (7) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
   (8) Clock spring (See 08-10-14 CLOCK SPRING REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Combination switch (See 09-18-19 Combination Switch Removal Note.)

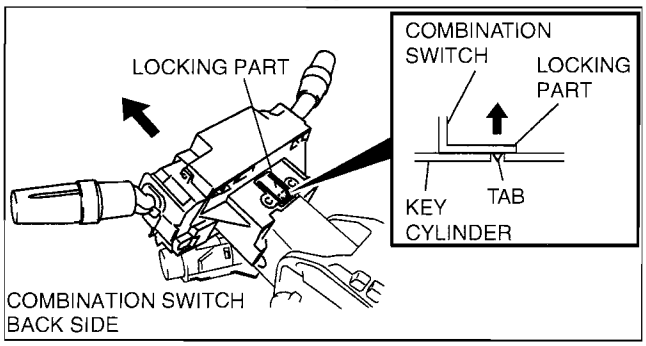
4. Install in the reverse order of removal.



am3uuw0000083

Combination Switch Removal Note

1. Pull the combination switch locks in the direction indicated in the figure and disengage the tab.
2. Pull the combination switch outward, then remove it.



am3uuw0000083

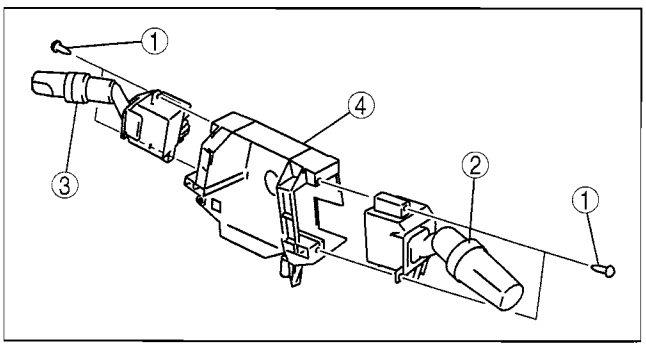
COMBINATION SWITCH DISASSEMBLY/ASSEMBLY

id091800802600

1. Disassemble in the order indicated in the table.

1	Screw
2	Wiper and washer switch
3	Light switch
4	Body

2. Assemble in the reverse order of disassembly.

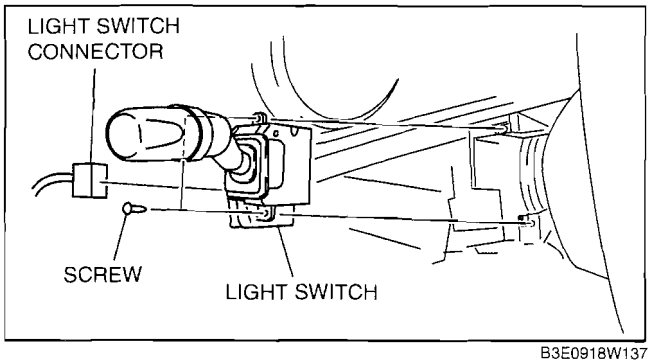


B3E0918W129

LIGHT SWITCH REMOVAL/INSTALLATION

id091800802800

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Disconnect the light switch connector.
4. Remove the screws, then remove the light switch.
5. Install in the reverse order of removal.



B3E0918W137

LIGHT SWITCH INSPECTION

id091800802900

1. Verify that the continuity between the light switch terminals is as indicated in the table.

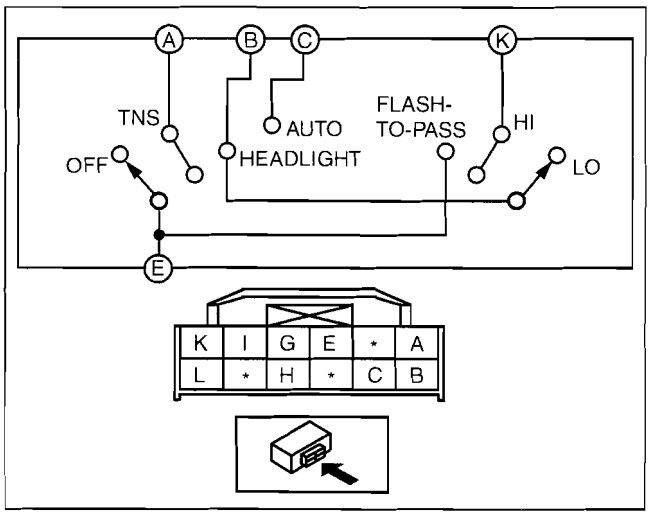
Headlight Switch

- If not as indicated in the table, replace the light switch.

O—O : Continuity

Switch position			Terminal				
Light	Dimmer	Flash-to-pass	A	B	C	E	K
OFF	—	OFF					
		ON		O		O	O
TNS	—	OFF	O			O	
		ON	O	O		O	O
Head light	LO	OFF	O	O		O	
		ON	O	O		O	O
	HI	—	O	O		O	O
Auto	LO	OFF	O	O	O	O	
		ON	O	O	O	O	O
	HI	—	O	O	O	O	O

B3E0918W139



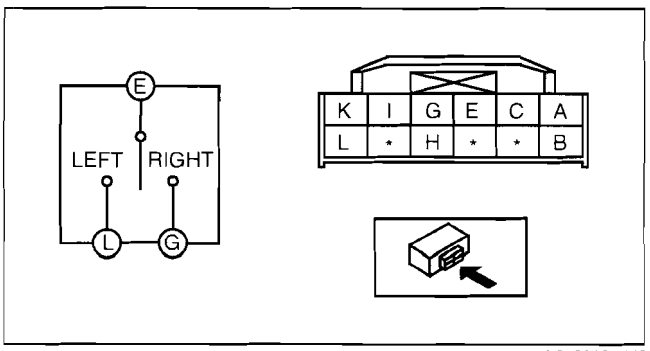
b3e0918w138

Turn Switch

O—O : Continuity

Switch position	Terminal		
	L	E	G
Left	O	O	
OFF			
Right		O	O

B3E0918W141

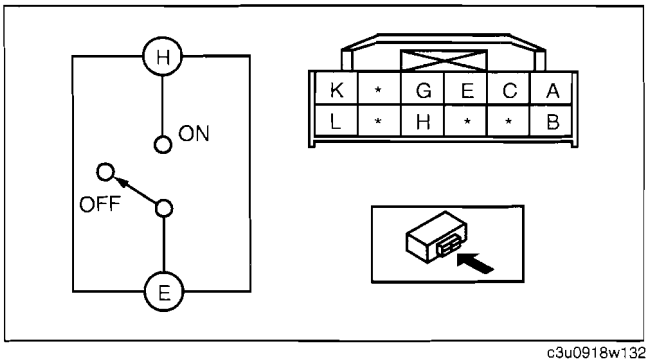


b3e0918w140

FRONT FOG LIGHT SWITCH INSPECTION

id091800803200

1. Verify that the continuity between the front fog light switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the light switch.



c3u0918w132

○—○ : Continuity

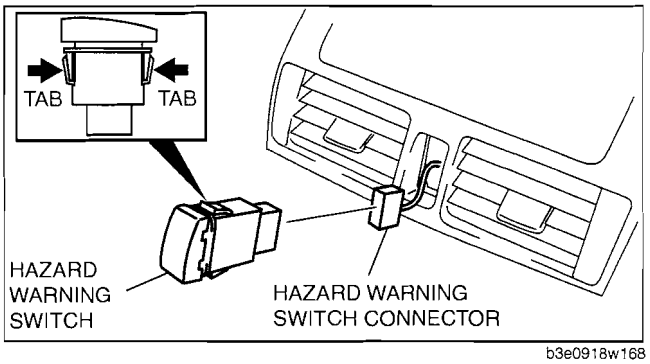
Switch position		Terminal	
Light	Front fog light switch	E	H
OFF	OFF		
	ON	○——	——○
TNS	ON	○——	——○
Head light	ON	○——	——○
Auto	ON	○——	——○

C3U0918W133

HAZARD WARNING SWITCH REMOVAL/INSTALLATION

id091800803000

1. Disconnect the negative battery cable.
2. Remove the decoration panel. (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
3. Remove the dashboard center panel. (See 09-17-15 DASHBOARD CENTER PANEL REMOVAL/INSTALLATION.)
4. Disconnect the hazard warning switch connector.
5. Squeeze the tabs of hazard warning switch and pull it outward to remove it.
6. Install in the reverse order of removal.

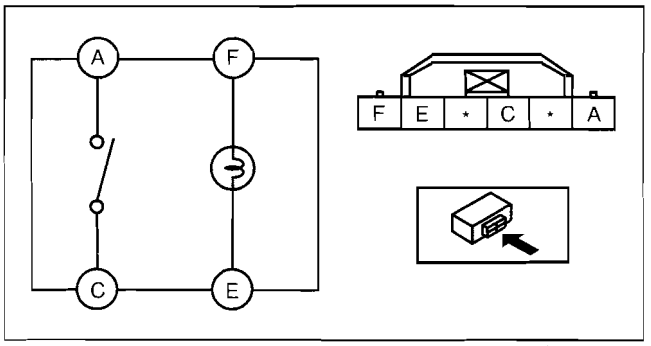


b3e0918w168

HAZARD WARNING SWITCH INSPECTION

id091800803100

1. Verify that the continuity between the hazard switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the hazard warning switch.



b3e0918w132

○—○ : Continuity ○—ⓑ—○ : Bulb

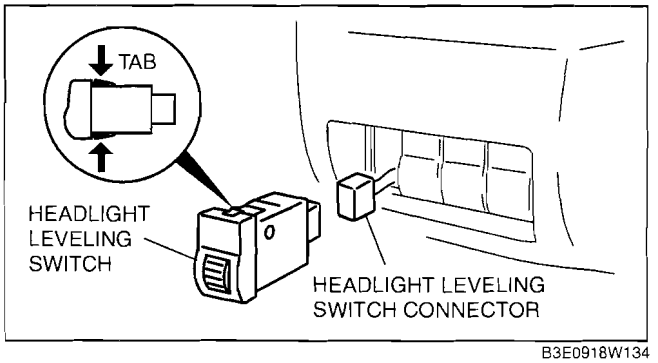
Switch position	Terminal			
	A	C	E	F
Off			○—ⓑ—○	
On	○——	——○	○—ⓑ—○	

B3E0918W133

HEADLIGHT LEVELING SWITCH REMOVAL/INSTALLATION

id091800803600

1. Disconnect the negative battery cable.
2. Detach the hood release lever from the lower panel. (See09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
3. Remove the front scuff plate. (Driver's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the front side trim. (Driver's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
5. Remove the lower panel. (See09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
6. Remove the headlight leveling switch
7. Disconnect the headlight leveling switch connector.
8. Install in the reverse order of removal.

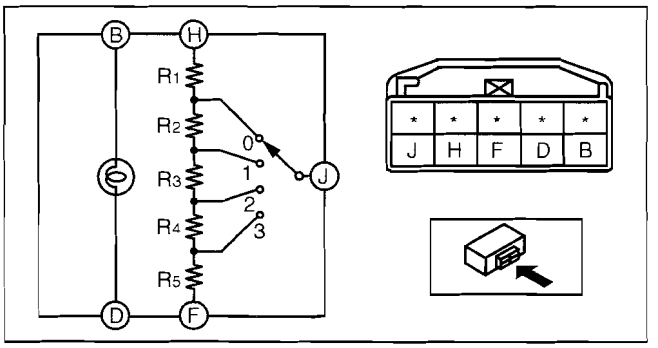


B3E0918W134

HEADLIGHT LEVELING SWITCH INSPECTION

id091800803700

1. Verify that continuity between the headlight leveling switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the headlight leveling switch.



b3e0918w135

: Resistance : Bulb

Switch position	Terminal				
	B	D	H	J	F
0			R1		R2 R3 R4 R5
1			R1	R2 R3	R4 R5
2			R1 R2	R3 R4	R5
3			R1 R2 R3 R4		R5

R1 : 715 ohms R2 : 715 ohms R3 : 261 ohms
R4 : 604 ohms R5 : 715 ohms

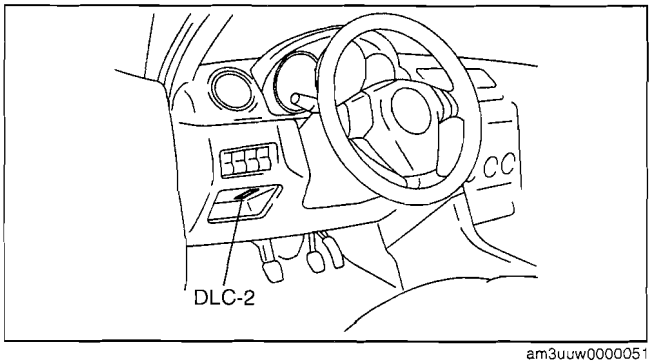
B3E0918W136

AUTO LIGHT ILLUMINATION LEVEL SETTING

id091800803300

1. Connect the M-MDS to the DLC-2 (16-pin).
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   When using the IDS (laptop PC)
   - Select "Module programming".

   When using the PDS (Pocket PC)
   - Select "Programming".
   - Select "Module programming".
3. Select "Programmable Parameters".
4. Select "Exterior Lighting".
5. Select "Autolamp On Setting - (GEM)".
6. Select "Standard"other or "Low other" on the M-MDS to set the illumination level.

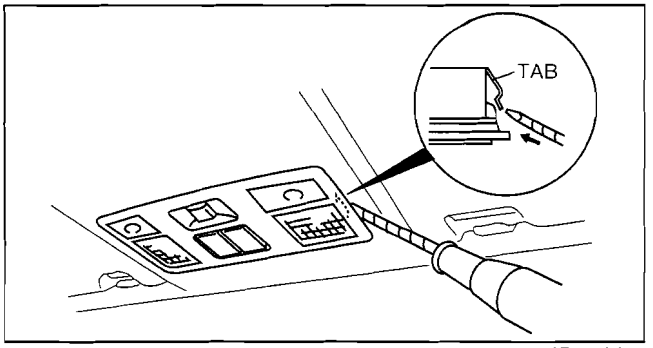


am3uuw0000051

MAP LIGHT REMOVAL/INSTALLATION

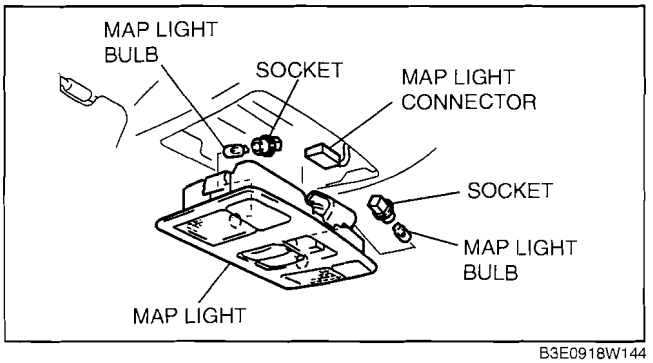
id091800801200

1. Disconnect the negative battery cable.
2. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the map light.
3. Press the tab and remove the map light.



B3E0918W145

4. Disconnect the map light connector.
5. Remove the socket, then remove the map light bulb.
6. install in the reverse order of removal.



B3E0918W144

09-18

MAP LIGHT INSPECTION

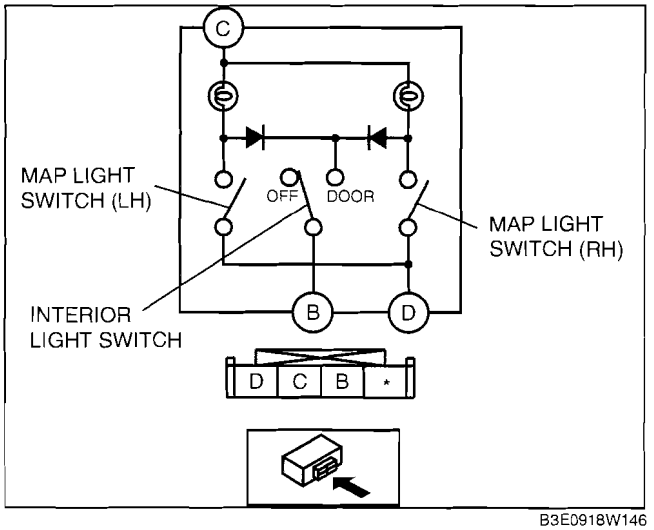
id091800801300

1. Verify that the continuity between the map light terminals is as indicated in the table.
   - If not as indicated in the table, replace the map light.

: Bulb

Switch position		Terminal		
Map light switch	Interior light switch	B	C	D
On	-		○—◎—○	
-	DOOR	○—◎—○		
Off	OFF			

b3e0918w147

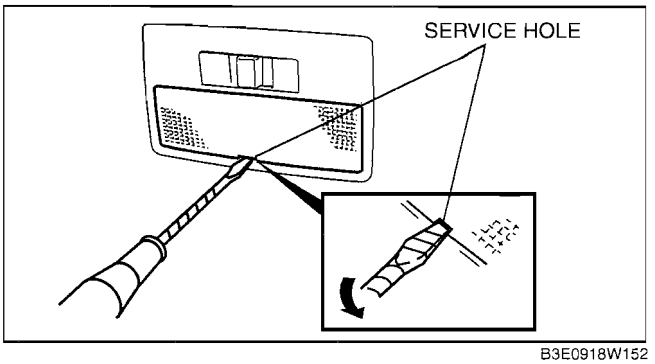


B3E0918W146

INTERIOR LIGHT REMOVAL/INSTALLATION

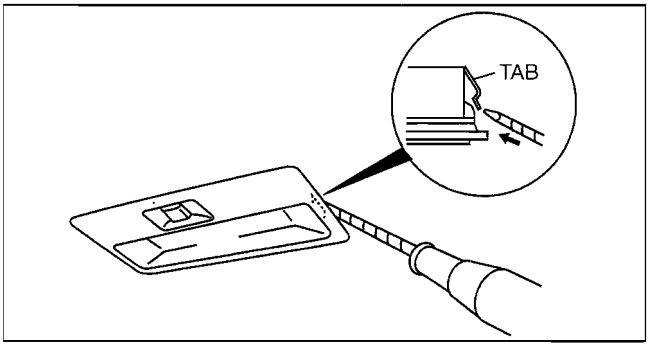
id091800801500

1. Disconnect the negative battery cable.
2. Insert a tape-wrapped flathead screwdriver into the service hole and pry with the screwdriver in the direction shown by the arrow to remove the lens.



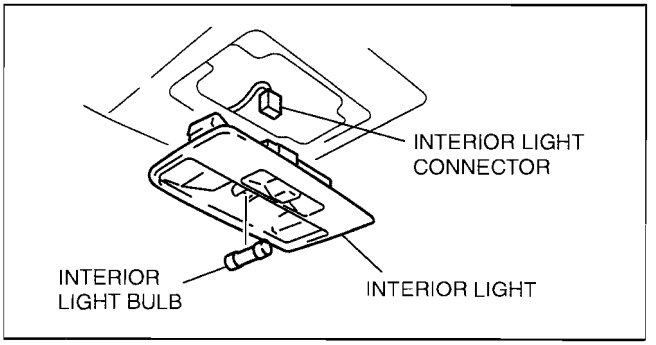
B3E0918W152

3. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the interior light.



b3e0918w151

4. Press the tab and remove the interior light.
5. Disconnect the interior light connector.
6. Install in the reverse order of removal.



b3e0918w150

INTERIOR LIGHT INSPECTION

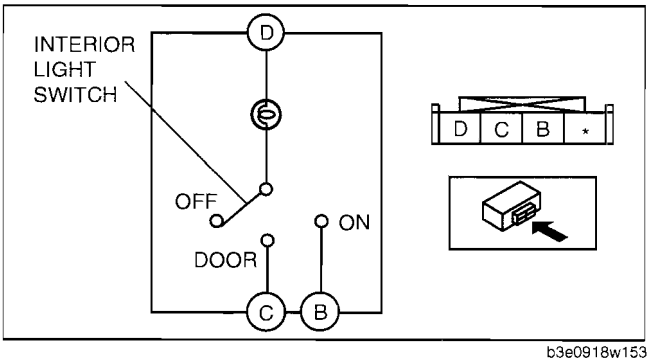
id091800801600

1. Verify that the continuity between the interior light terminals is as indicated in the table.
   - If not as indicated in the table, replace the interior light.

: Bulb

Switch position	Terminal		
	B	C	D
ON	○	⊚	○
DOOR		○	⊚ ○
OFF			

B3E0918W154

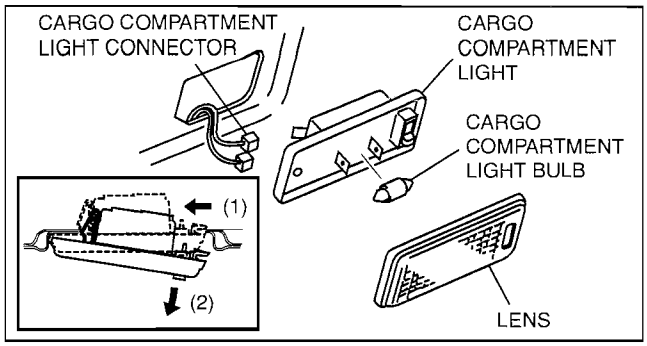


b3e0918w153

CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION

id091800801700

1. Disconnect the negative battery cable.
2. Remove the cargo compartment light.
3. Disconnect the cargo compartment light connector.
4. Remove the lens.
5. Remove the cargo compartment light bulb.
6. Install in the reverse order of removal.



B3E0918W159

CARGO COMPARTMENT LIGHT INSPECTION

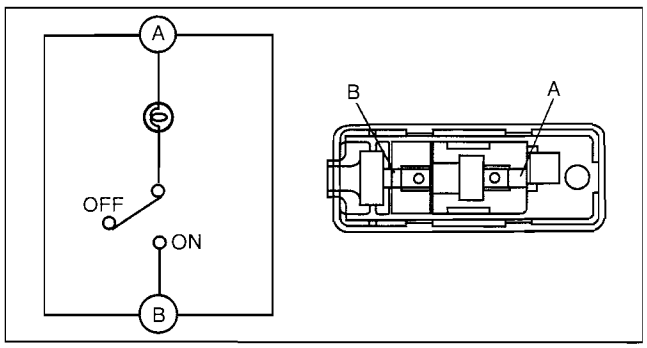
id091800801800

1. Verify that the continuity between the cargo compartment light terminals is as indicated in the table.
   - If not as indicated in the table, replace the cargo compartment light.

: Bulb

Switch position	Terminal	
	A	B
ON	○—⊕—○	
OFF		

A6E8114W114

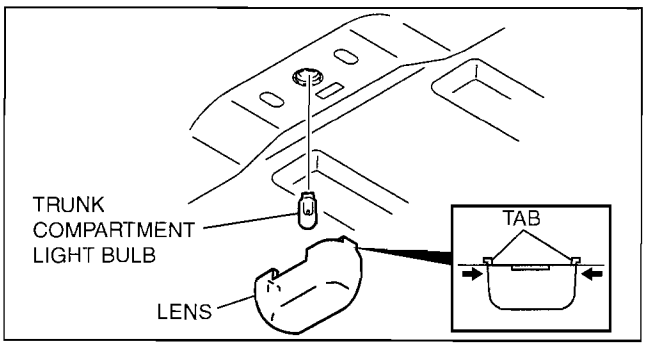


B3E0918W176

TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION

id091800806200

1. Disconnect the negative battery cable.
2. Disengage the tabs by pressing both ends of the lens in the directions indicated by the arrows and remove the lens.
3. Install in the reverse order of removal.

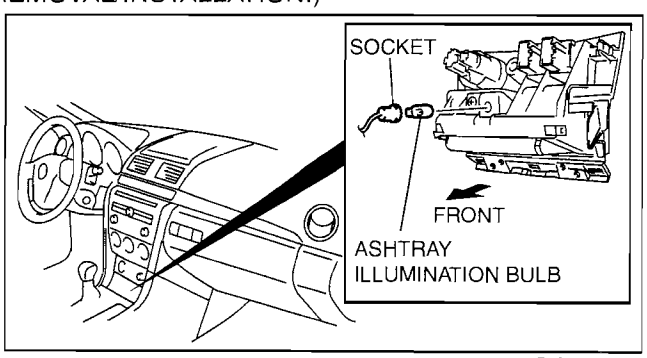


b3e0918w155

ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION

id091800806300

1. Disconnect the negative battery cable.
2. Remove the ashtray panel. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Remove the socket, then remove the ashtray illumination bulb.
4. Install in the reverse order of removal.

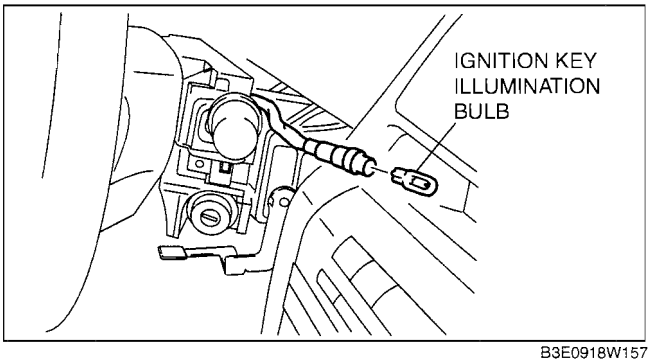


B3E0918W156

IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION

id091800802400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Remove the ignition key illumination bulb.
4. Install in the reverse order of removal.

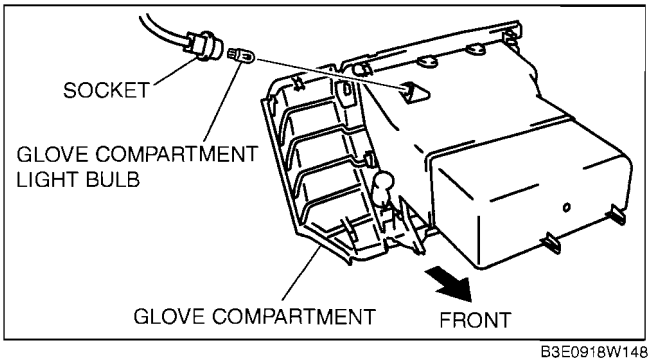


B3E0918W157

GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION

id091800801900

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (Passenger's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Passenger's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Decoration panel (See09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (4) Glove compartment (See09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
3. Remove the socket, then remove the glove compartment light bulb.
4. Install in the reverse order of removal.

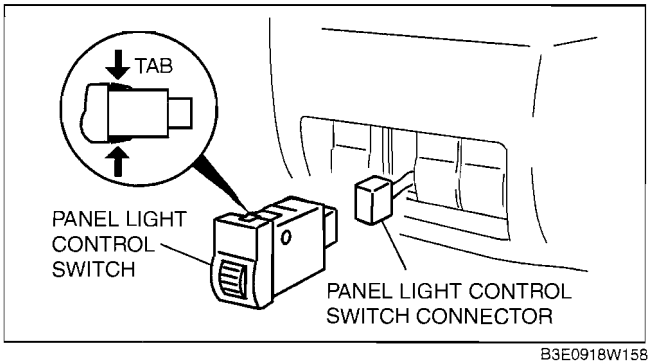


B3E0918W148

PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION

id091800806500

1. Disconnect the negative battery cable.
2. Detach the hood release lever from the lower panel. (See09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
3. Remove the front scuff plate. (Driver's side) (See09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
4. Remove the front side trim. (Driver's side) (See09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
5. Remove the lower panel. (See09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
6. Remove the panel light control switch.
7. Disconnect the panel light control switch connector.
8. Install in the reverse order of removal.



B3E0918W158

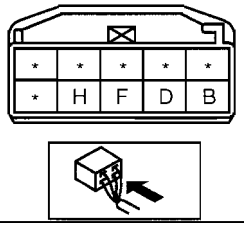
PANEL LIGHT CONTROL SWITCH INSPECTION

id091800806400

1. Measure the voltage at each terminal (other than terminal D).
   - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)".
2. Disconnect the panel light control switch connector.
3. Verify that continuity at terminal D is as indicated in the Terminal Voltage Table (Reference).
   - If there is any malfunction, inspect the parts under "Inspection item(s)".
     — If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the panel light control switch.

Terminal Voltage Table (Reference)

PANEL LIGHT CONTROL SWITCH
HARNESS SIDE CONNECTOR

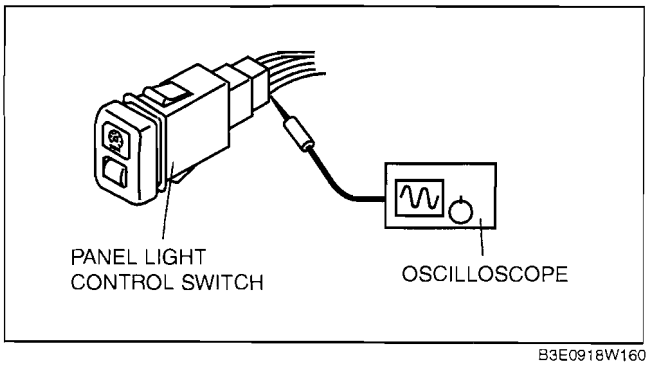


B3E0918W173

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/ Continuity	Inspection item(s)
B	TNS	PJB	Turn the light switch to the TNS or ON position.	B+	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • ILLUMI 7.5 A fuse • Related wiring harnesses
			Turn the light switch to the OFF position.	1.0 or less	
D	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	• GND • Related wiring harnesses
F	Panel light control	Illumination bulb	Panel light control switch turn to the brightest setting.	GND	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • Related wiring harnesses
			Panel light control switch turn to the darkest setting.	(See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.)	
H	Panel light control input	Panel light control switch	Panel light control switch turn to the brightest setting.	Approx. 4.5	• PJB (See 09-40-3 PASSENGER JUNCTION BOX (PJB) INSPECTION.) • Related wiring harnesses
			Panel light control switch turn to the darkest setting.	1.0 or less	

Terminals H Inspection

1. Measure the wave pattern of panel light control switch terminals H using a tester.
2. Turn the light switch to the TNS or ON position.
3. Verify that the resistance changes smoothly while turning the panel light control switch from the brightest to the darkest setting.

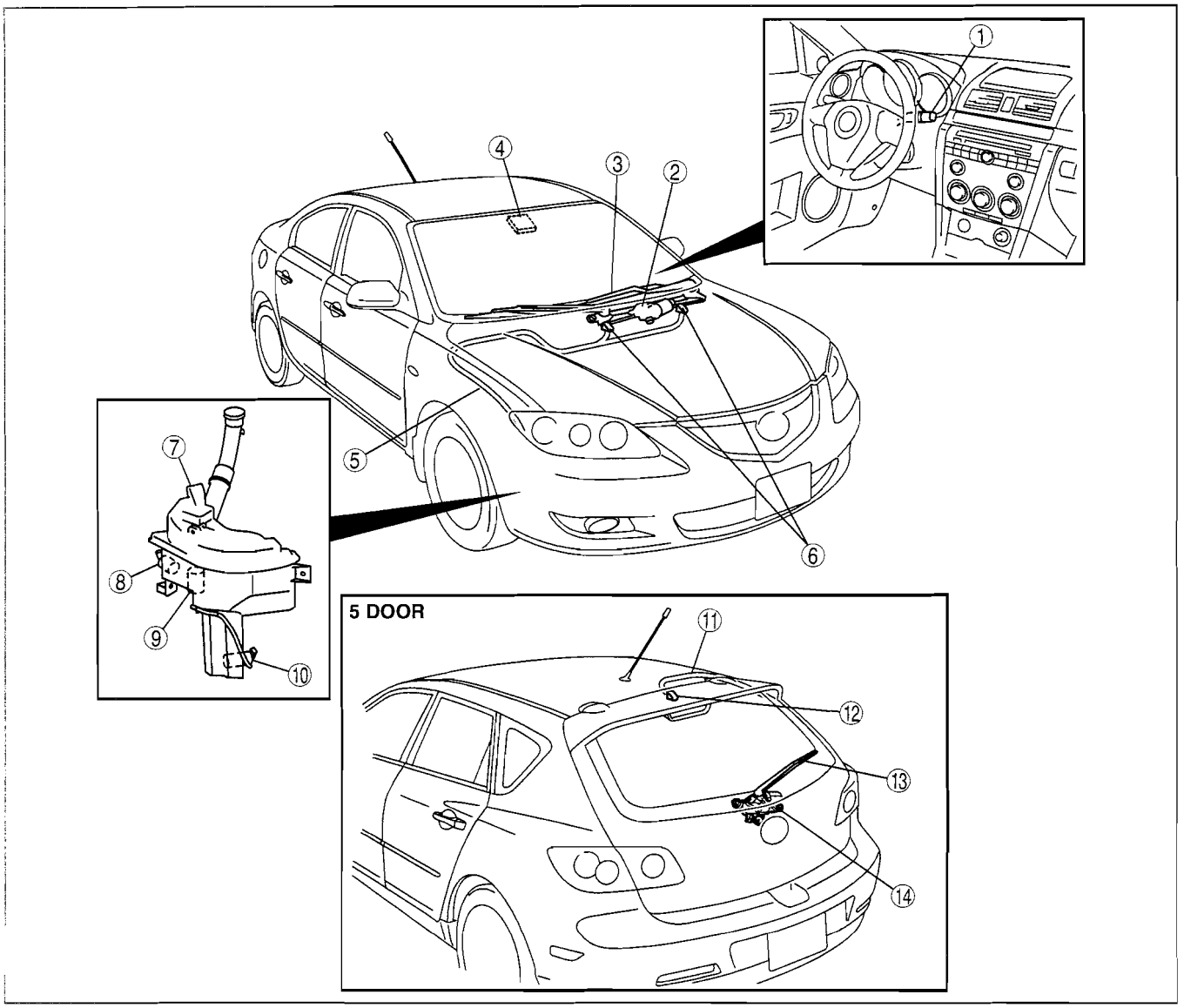


B3E0918W160

09-19 WIPER/WASHER SYSTEM

WIPER/WASHER SYSTEM LOCATION INDEX

id091900800100



c3u0919w101

1	Windshield wiper and washer switch (See 09-19-11 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.) (See 09-19-11 WINDSHIELD WIPER AND WASHER SWITCH INSPECTION.) (See 09-19-12 REAR WIPER AND WASHER SWITCH INSPECTION.)
2	Windshield wiper motor (See 09-19-4 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.) (See 09-19-5 WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY.) (See 09-19-6 WINDSHIELD WIPER LINK DISASSEMBLY/ASSEMBLY.) (See 09-19-7 WINDSHIELD WIPER MOTOR INSPECTION.)
3	Windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.) (See 09-19-4 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT.)
4	Rain sensor (See 09-19-16 RAIN SENSOR REMOVAL/INSTALLATION.)
5	Windshield washer hose (See 09-19-9 WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION.)
6	Windshield washer nozzle (See 09-19-9 WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION.) (See 09-19-9 WINDSHIELD WASHER NOZZLE CLEANING.)
7	Washer tank (See 09-19-7 WASHER TANK REMOVAL/INSTALLATION.)
8	Rear washer motor (See 09-19-14 REAR WASHER MOTOR REMOVAL/INSTALLATION.) (See 09-19-14 REAR WASHER MOTOR INSPECTION.)

9	Washer fluid-level sensor (See 09-19-10 WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION.) (See 09-19-10 WASHER FLUID-LEVEL SENSOR INSPECTION.)
10	Windshield washer motor (See 09-19-8 WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION.) (See 09-19-8 WINDSHIELD WASHER MOTOR INSPECTION.)
11	Rear washer hose (See 09-19-15 REAR WASHER HOSE REMOVAL/INSTALLATION.)
12	Rear washer nozzle (See 09-19-15 REAR WASHER NOZZLE REMOVAL/INSTALLATION.) (See 09-19-15 REAR WASHER NOZZLE ADJUSTMENT.) (See 09-19-15 REAR WASHER NOZZLE CLEANING.)
13	Rear wiper arm and blade (See 09-19-12 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION.) (See 09-19-13 REAR WIPER ARM AND BLADE ADJUSTMENT.)
14	Rear wiper motor (See 09-19-13 REAR WIPER MOTOR REMOVAL/INSTALLATION.) (See 09-19-14 REAR WIPER MOTOR INSPECTION.)

WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION

id091900800700

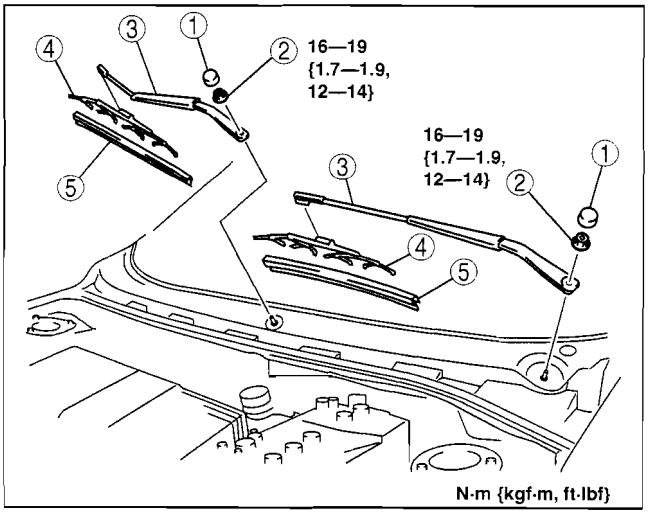
Warning

- **When the ignition switch is turned to the ON position, and the wiper and washer switch is in the AUTO position, the windshield wipers may operate automatically in the following cases. Always turn the ignition switch, and the wiper and washer switch off before handling the windshield wipers; otherwise a pinched hand or fingers could result in injury or a wiper system malfunction:**
  - **— The upper part of the windshield rain sensor is touched.**
  - **— The windshield receives an impact.**
  - **— The rain sensor receives an impact from the cabin.**

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Windshield wiper arm (See 09-19-4 Windshield Wiper Arm Installation Note.)
4	Windshield wiper blade
5	Rubber brush

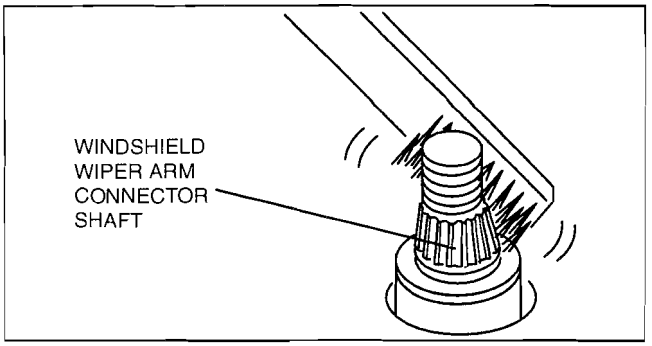
2. Install in the reverse order of removal.
3. Adjust the windshield wiper arm and blade. (See 09-19-4 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT.)



c3u0919w102

Windshield Wiper Arm Installation Note

1. Clean the windshield wiper arm connector shafts using a wire brush before installing the windshield wiper arms.

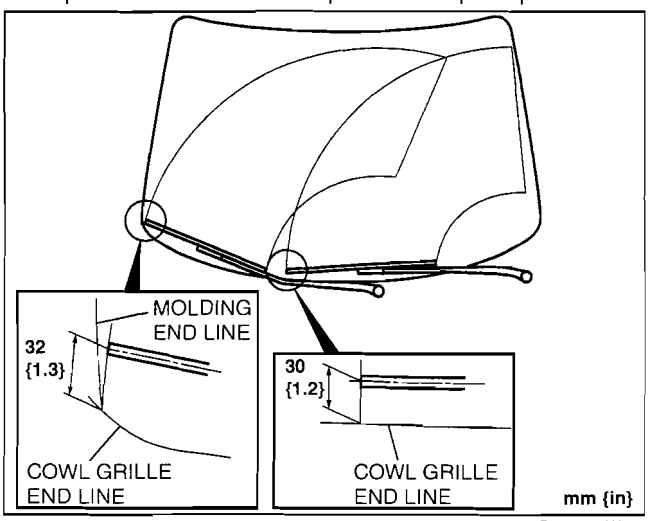


am3uuw0000083

WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT

id091900800800

1. Operate the windshield wipers, and turn off the windshield wiper motor to set the wipers in the park position.
2. Adjust the windshield wiper arm connector shafts to set the arm heights as shown.

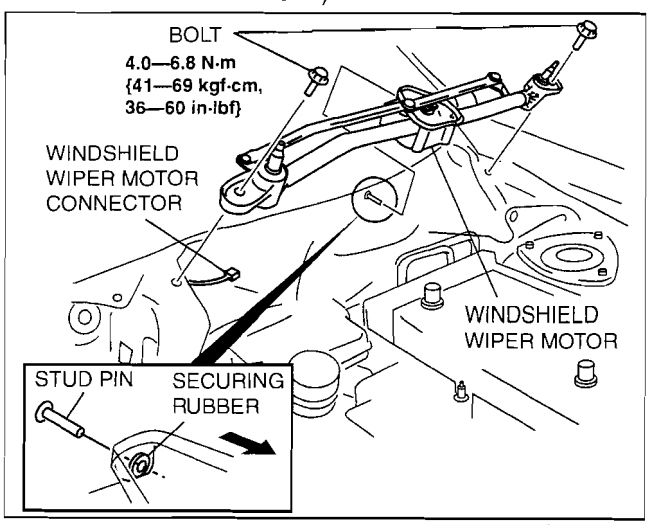


B3E0919W103

WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION

id091900800900

1. Disconnect the negative battery cable.
2. Remove the windshield wiper arm and blade. (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
3. Remove the cowl grille. (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
4. Remove the cowl panel. (See 09-10-20 COWL PANEL REMOVAL/INSTALLATION.)
5. Remove the bolts.
6. Move the windshield wiper motor in the direction of the arrow, remove the securing rubber from the stud pin (for connecting the motor securing rubber), and then remove the windshield wiper motor.
7. Disconnect the windshield wiper motor connector.
8. Install in the reverse order of removal.



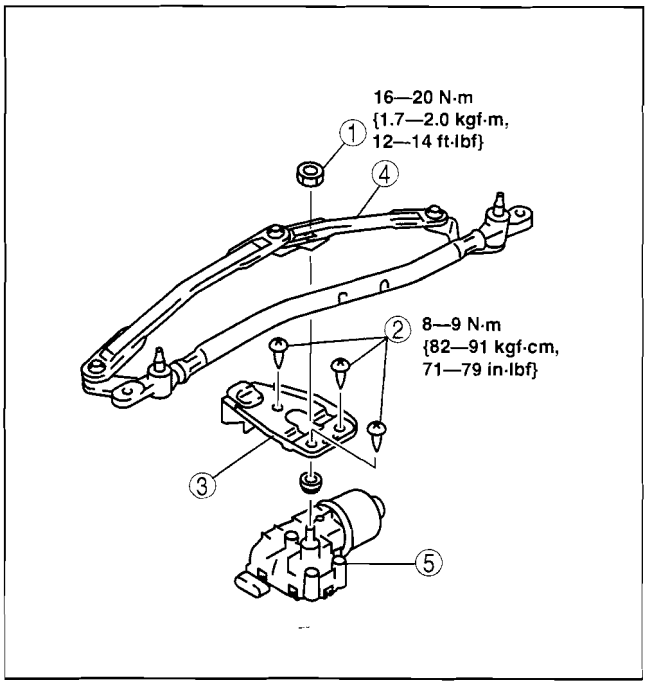
b3e0919w104

WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY

id091900801000

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

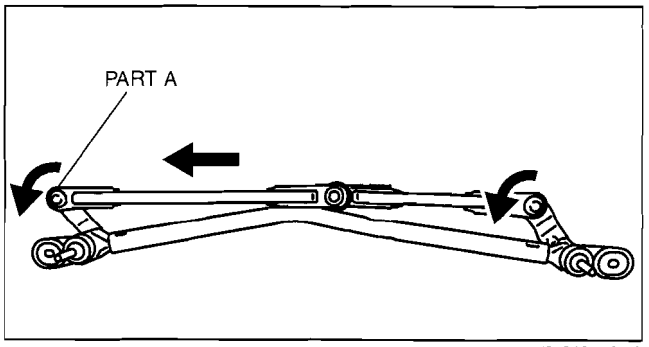
1	Nut
2	Screw
3	Bracket
4	Windshield wiper link
5	Windshield wiper motor (See 09-19-5 Windshield Wiper Motor Assembly Note.)



d3u919zw600a

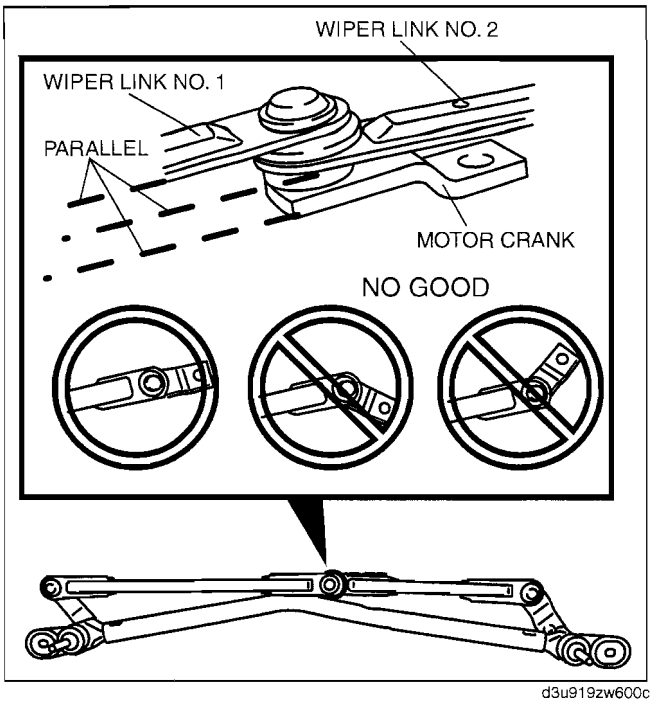
Windshield Wiper Motor Assembly Note

1. Connect the windshield wiper motor to the vehicle wiring harness connector. operate the windshield wipers and then stop them in the auto-stop position.
2. Rotate the windshield wiper link so that part A shown in the figure is as far to the left as possible.
3. Assemble the windshield wiper link and bracket to the windshield wiper motor.



d3u919zw600b

4. Adjust the motor crank and wiper link No. 1 so that they are parallel with each other as shown in the figure and assemble them to the windshield wiper motor shaft.



d3u919zw600c

WINDSHIELD WIPER LINK DISASSEMBLY/ASSEMBLY

id091900803600

Disassembly

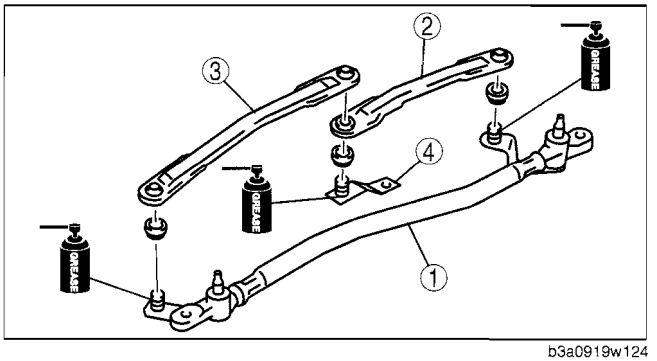
Note

- Do not replace link parts individually. If it is necessary to replace any part, replace the windshield wiper link as a single unit.

Assembly

1. Assemble in the order indicated in the table.

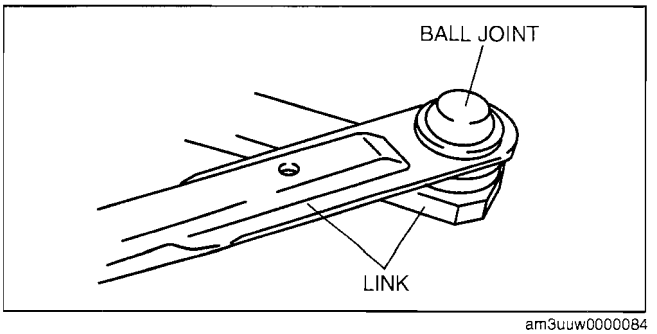
1	Main link (See 09-19-6 Ball Joint Assembly Note.)
2	Wiper link No. 2 (See 09-19-6 Ball Joint Assembly Note.)
3	Wiper link No. 1 (See 09-19-6 Ball Joint Assembly Note.) (See 09-19-7 Wiper Link No. 1 Assembly Note.)
4	Motor crank (See 09-19-6 Ball Joint Assembly Note.)



b3a0919w124

Ball Joint Assembly Note

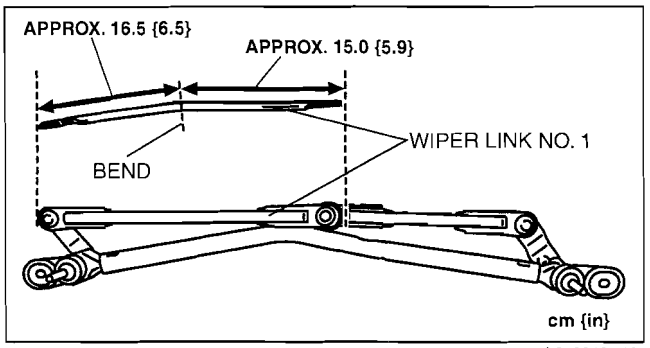
1. Use a clean rag to protect the link and squeeze using pliers.



am3uuw0000084

Wiper Link No. 1 Assembly Note

1. Assemble the wiper link No. 1 positioned as shown in the figure.



b3a0919w125

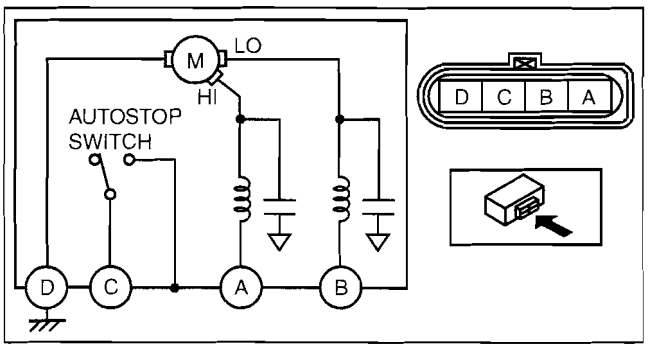
WINDSHIELD WIPER MOTOR INSPECTION

id091900801100

1. Disconnect the windshield wiper motor connector.
2. Connect battery positive voltage to windshield wiper motor terminal A or B, and ground to terminal D, then verify that the windshield wipers operate as shown in the table.
   - If the windshield wipers do not operate as indicated in the table, replace the windshield wiper motor.

Terminal connected to battery positive voltage	Operation condition
A	HI
B	LO

B3E0919W107

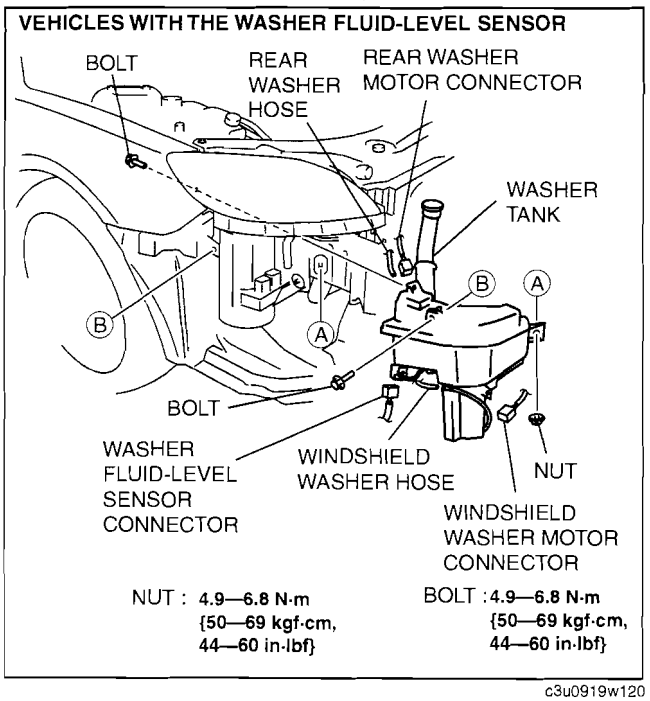


B3E0919W106

WASHER TANK REMOVAL/INSTALLATION

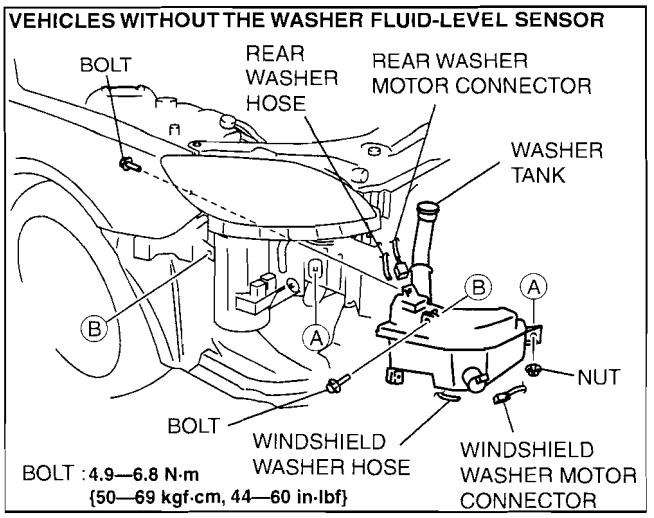
id091900801700

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See09-10-8 FRONT BUMPER REMOVAL/INSTALLATION.)
3. Disconnect the windshield washer motor connector and windshield washer hose.



c3u0919w120

4. Disconnect the rear washer motor connector and rear washer hose. (5 door)
5. Disconnect the washer fluid-level sensor connector. (Vehicles with the washer fluid-level sensor)
6. Remove the bolts and nut, then remove the washer tank.
7. Install in the reverse order of removal.

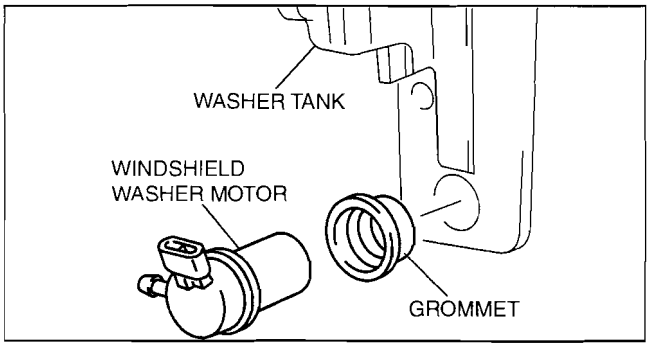


c3u0919w121

WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION

id091900802400

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See 09-19-7 WASHER TANK REMOVAL/INSTALLATION.)
3. Remove the windshield washer motor, then remove the grommet.
4. Install in the reverse order of removal.

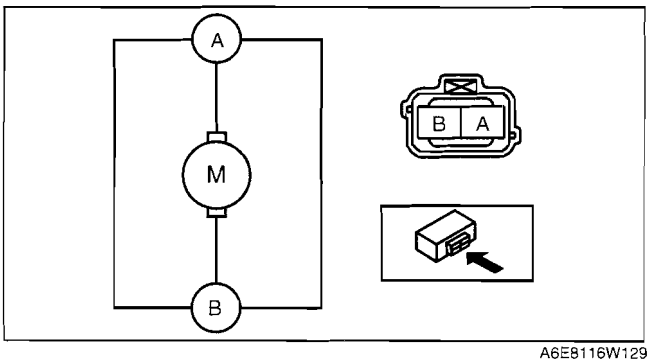


B3E0919W122

WINDSHIELD WASHER MOTOR INSPECTION

id091900802500

1. Connect battery positive voltage to windshield washer motor terminal A and terminal B to ground.
2. Verify that the windshield washer motor operates normally.
   - If there is any malfunction, replace the windshield washer motor.

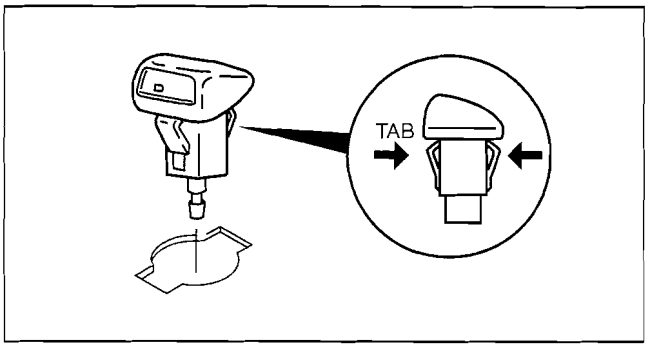


A6E8116W129

WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION

id091900802000

1. Remove the windshield wiper arm and blade. (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Remove the cowl grille. (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
3. Remove the windshield washer hose from the windshield washer nozzle.
4. Squeeze the tabs of the windshield washer nozzle.
5. Pull the windshield washer nozzle out to remove it.
6. Install in the reverse order of removal.



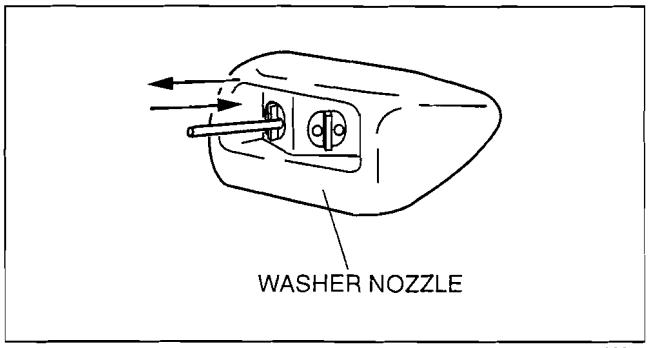
am3uuw0000006

WINDSHIELD WASHER NOZZLE CLEANING

id091900803800

Except Mazdaspeed3

1. Clean the washer nozzle by inserting and moving a needle or an equivalent tool back and forth.
   - If the nozzle becomes clogged again after cleaning, remove the hose from washer nozzle. Make sure there is enough washer fluid. Then turn the washer switch on and flush the inside of the hose.



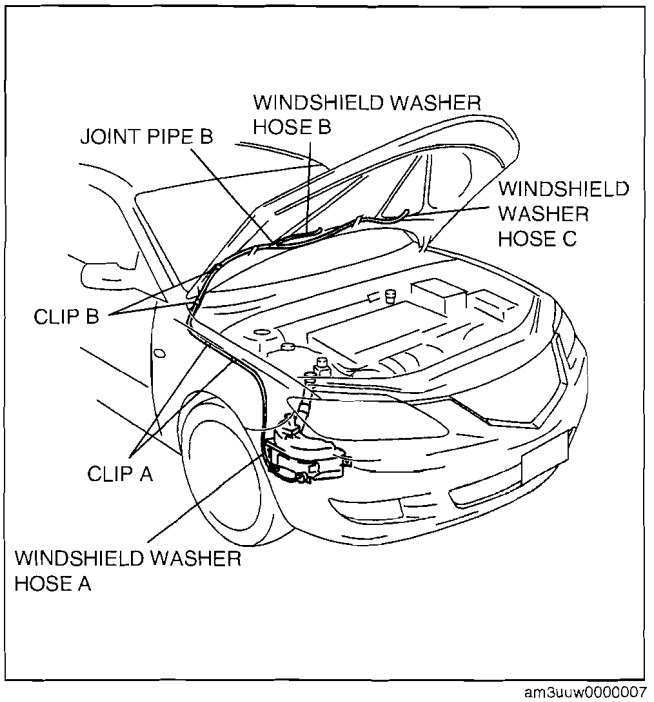
am3uuw0000012

WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION

id091900802100

Except Mazdaspeed3

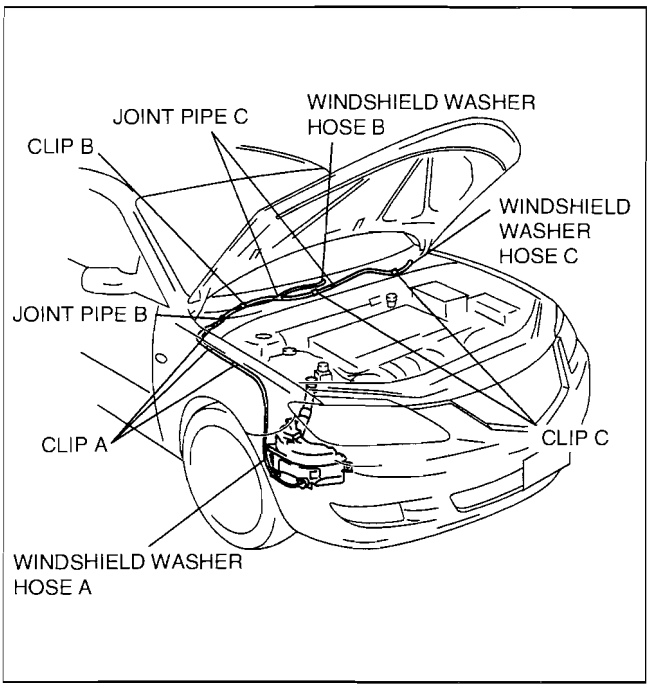
1. Remove the hood insulator. (See 09-10-3 HOOD REMOVAL/INSTALLATION)
2. Slightly bend back the mudguard.
3. Disconnect joint pipe A.
4. Remove windshield washer hose A from clips A.
5. Remove clips B.
6. Disconnect windshield washer hose B from the washer nozzle.
7. Disconnect windshield washer hose C from the washer nozzle.
8. Disconnect joint pipe B, then remove windshield washer hose A, B and C.
9. Install in the reverse order removal.



am3uuw0000007

Mazdaspeed3

1. Remove the windshield wiper arm and blade (See 09-19-3 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
2. Remove the cowl grille (See 09-16-7 COWL GRILLE REMOVAL/INSTALLATION.)
3. Disconnect windshield washer hose A from the washer tank.
4. Remove the windshield washer hose A from clips A.
5. Remove the joint pipe B.
6. Remove the clip B.
7. Remove the joint pipes C.
8. Remove the clips C.
9. Disconnect windshield washer hose B from the washer nozzle.
10. Disconnect windshield washer hose C from the washer nozzle.
11. Disconnect joint pipe B, then remove windshield washer hose A, B and C.
12. Install in the reverse order of removal.

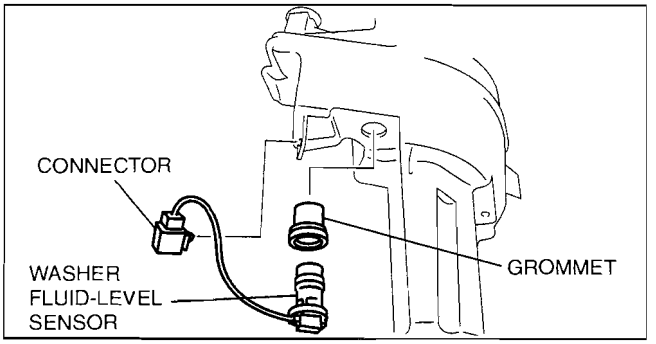


c3u0919w125

WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION

id091900801800

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See 09-19-7 WASHER TANK REMOVAL/INSTALLATION)
3. Disconnect the connector.
4. Remove the washer fluid-level sensor.
5. Remove the grommet.
6. Install in the reverse order of removal.



B3E0919W123

WASHER FLUID-LEVEL SENSOR INSPECTION

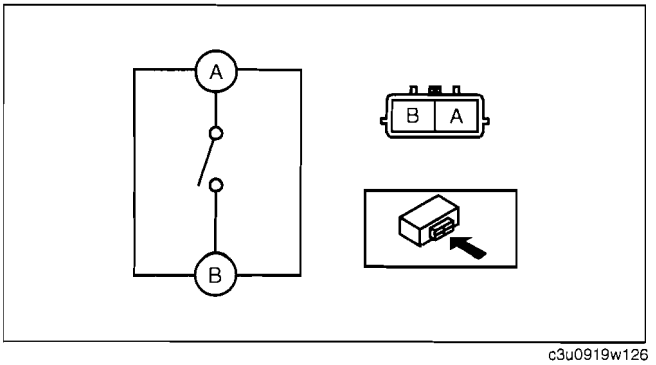
id091900801900

1. Disconnect the negative battery cable.
2. Inspect for continuity between the washer fluid-level sensor terminals using an ohmmeter.
   - If not as specified, replace the washer fluid-level sensor.

O—O : Continuity

Fluid level	Terminal	
	A	B
Above low		
Below low	O	O

B3E0919W144

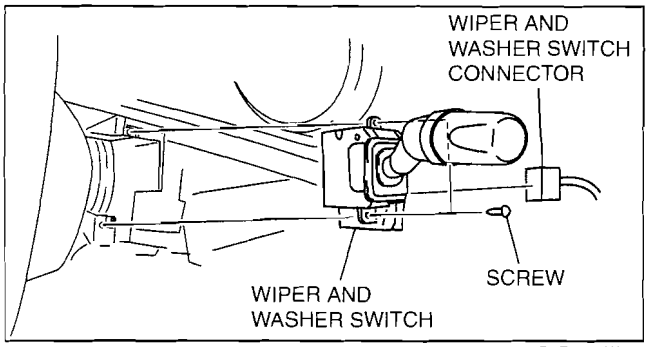


c3u0919w126

WIPER AND WASHER SWITCH REMOVAL/INSTALLATION

id091900800200

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Column cover (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Disconnect the wiper and washer switch connector.
4. Remove the screws, then remove the wiper and washer switch.
5. Install in the reverse order of removal.

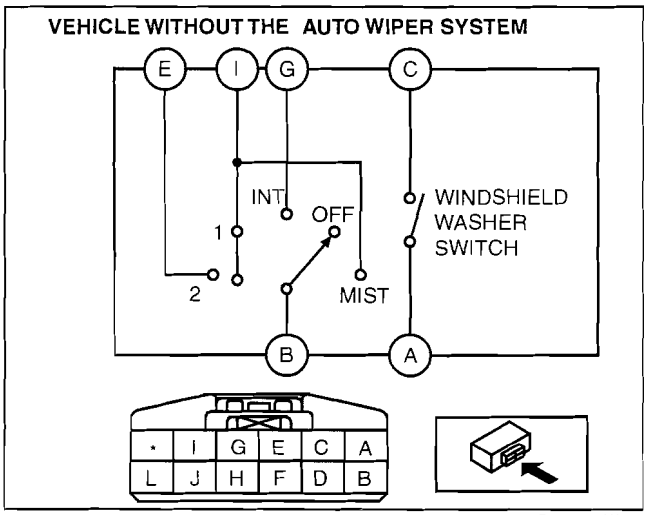


B3E0919W151

WINDSHIELD WIPER AND WASHER SWITCH INSPECTION

id091900800300

1. Verify that the continuity between the windshield wiper and washer switch is as indicated in the table.



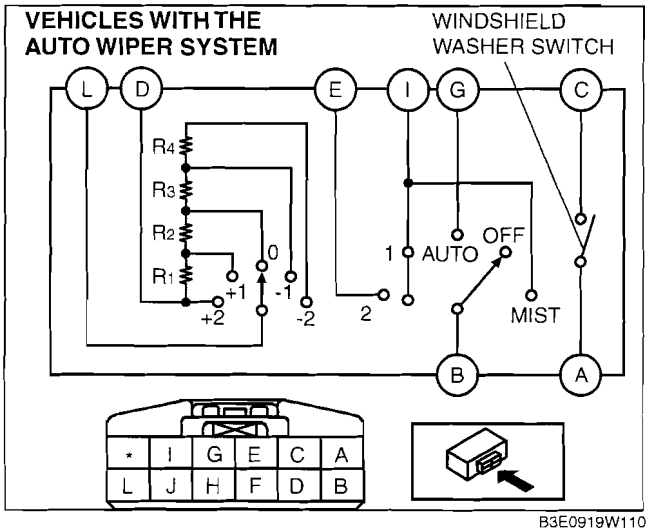
B3E0919W127

- If not as indicated in the table, replace the wiper and washer switch.

○—○ : Continuity

Switch position		Mist	Terminal					
			A	B	C	E	G	I
Windshield wiper switch	OFF	OFF						
		ON		○				○
	AUTO (INT)			○			○	
	1			○				○
	2			○		○		○
Windshield washer switch	ON		○		○			

B3E0919W128



B3E0919W110

VEHICLE WITH THE AUTO WIPER SYSTEM

: Resistance

Switch position		Terminal D	Terminal L
+	2		
	1	R_1	
0		R_1 R_2	
-	1	R_1 R_2 R_3	
	2	R_1 R_2 R_3 R_4	

R_1 : 228—252 ohms R_2 : 228—252 ohms
R_3 : 228—252 ohms R_4 : 228—252 ohms

B3E0919W111

REAR WIPER AND WASHER SWITCH INSPECTION

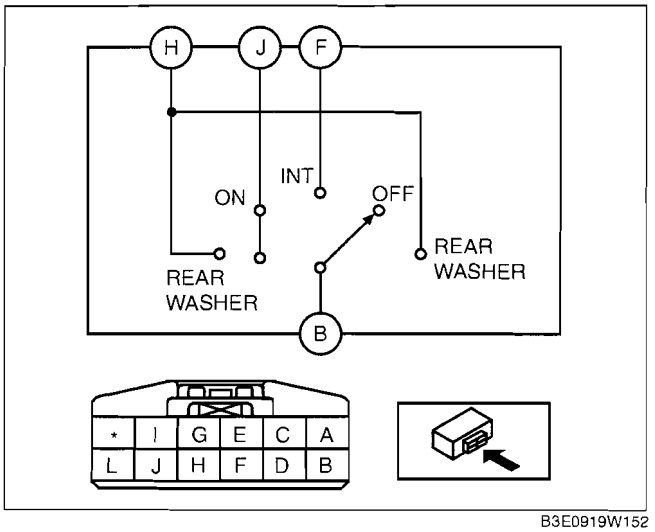
id091900800400

1. Verify that the continuity between the rear wiper and washer switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the wiper and washer switch.

: Continuity

Switch position		Terminal B	Terminal F	Terminal H	Terminal J
Rear wiper switch	OFF				
	ON	○			○
	INT	○	○		
Rear wiper and washer switch	ON	○		○	○
Rear washer switch	ON	○		○	

B3E0919W153



B3E0919W152

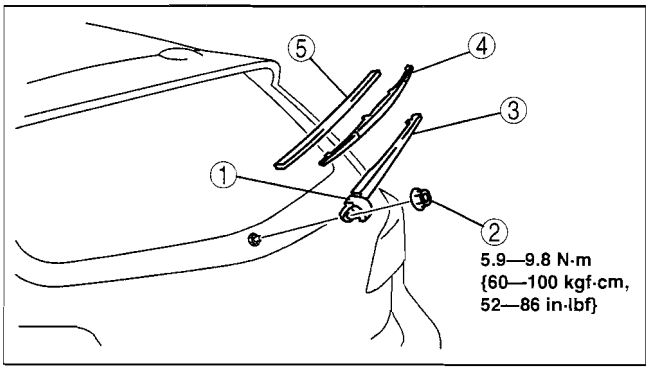
REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION

id091900801200

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Rear wiper arm (See 09-19-13 Rear Wiper Arm Installation Note.)
4	Rear wiper blade
5	Rubber brush

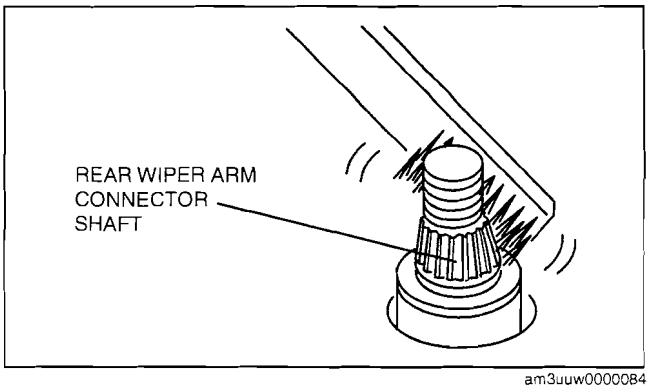
2. Install in the reverse order of removal.
3. Adjust the rear wiper arm and blade. (See 09-19-13 REAR WIPER ARM AND BLADE ADJUSTMENT.)



am3uuw0000084

Rear Wiper Arm Installation Note

1. Clean the rear wiper arm connector shaft using a wire brush before installing the rear wiper arm.

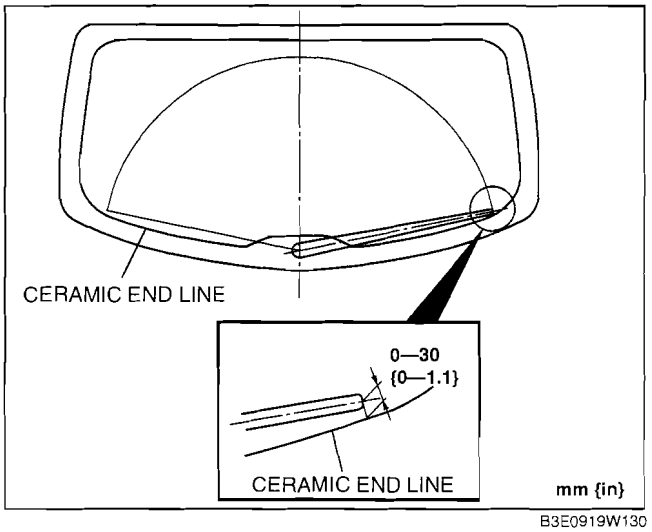


am3uuw0000084

REAR WIPER ARM AND BLADE ADJUSTMENT

id091900801300

1. Operate the rear wiper motor to set the wiper in the park position.
2. Set the rear wiper arm onto the ceramic end line.

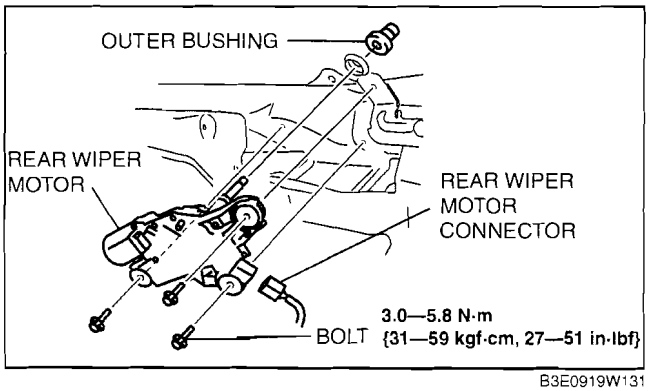


B3E0919W130

REAR WIPER MOTOR REMOVAL/INSTALLATION

id091900801400

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Rear wiper arm and blade (See 09-19-12 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION.)
   (2) Liftgate upper trim (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
   (3) Liftgate side trim (See 09-17-22 LIFTGATE SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Liftgate lower trim (See 09-17-23 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION.)
3. Disconnect the rear wiper motor connector.
4. Remove the bolts, then remove the rear wiper motor.
5. Remove the outer bushing.
6. install in the reverse order of removal.

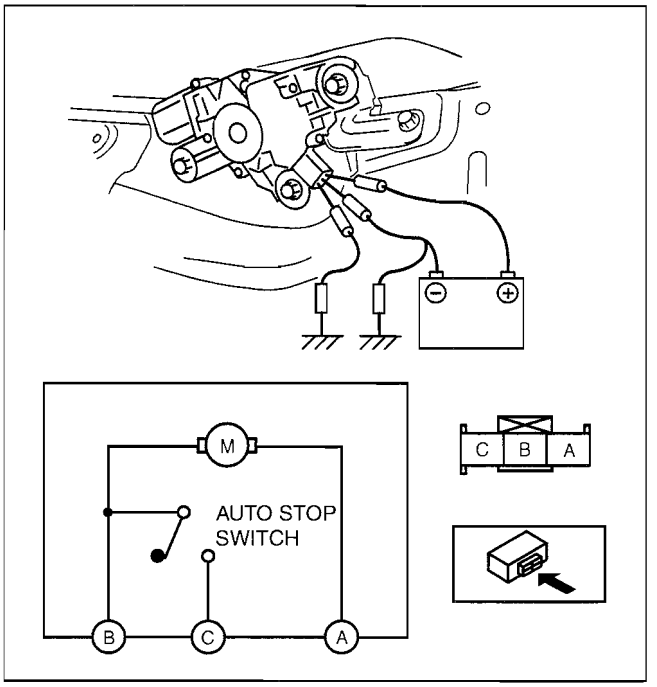


B3E0919W131

REAR WIPER MOTOR INSPECTION

id091900801500

1. Connect battery positive voltage to the rear wiper motor terminal B, and ground the rear wiper motor terminal A.
2. Verify that the rear wiper motor operates.
   - If there is any malfunction, replace the rear wiper motor.

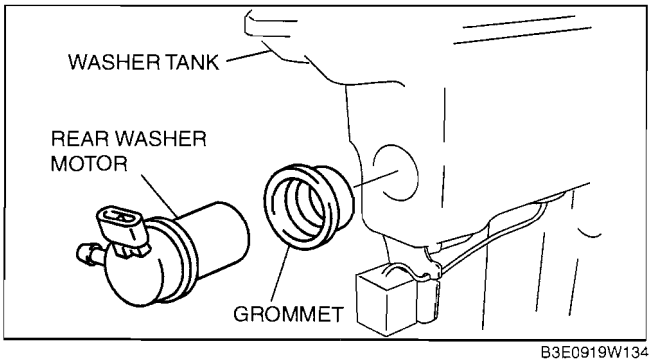


b3e0919w132

REAR WASHER MOTOR REMOVAL/INSTALLATION

id091900802600

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See 09-19-7 WASHER TANK REMOVAL/INSTALLATION)
3. Remove the rear washer motor, then remove the grommet.
4. Install in the reverse order of removal.

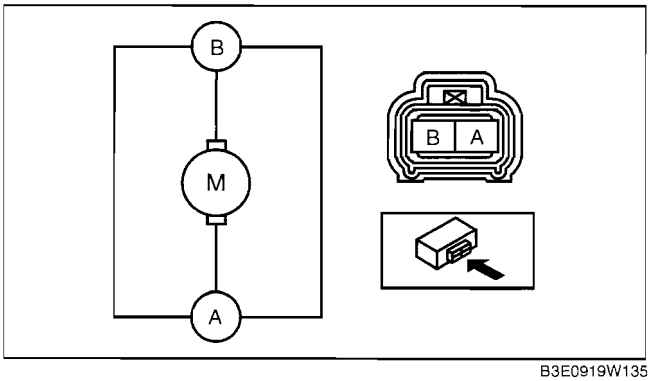


B3E0919W134

REAR WASHER MOTOR INSPECTION

id091900802700

1. Connect battery positive voltage to rear washer motor terminal A and terminal B to ground.
2. Verify that the rear washer motor operates normally.
   - If there is any malfunction, replace the rear washer motor.

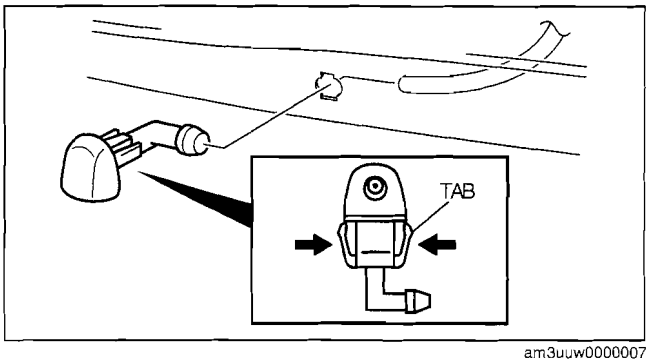


B3E0919W135

REAR WASHER NOZZLE REMOVAL/INSTALLATION

id091900802200

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove the rear spoiler. (See 09-16-9 REAR SPOILER REMOVAL/INSTALLATION.)
4. Squeeze the tabs, then remove the rear washer nozzle.
5. Install in the reverse order of removal.
6. Adjust the rear washer nozzle. (See 09-19-15 REAR WASHER NOZZLE ADJUSTMENT.)

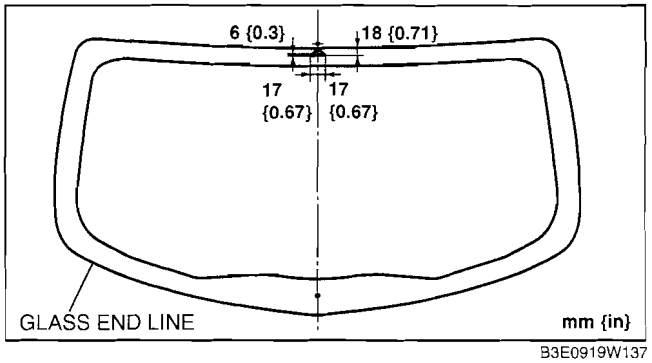


am3uuw0000007

REAR WASHER NOZZLE ADJUSTMENT

id091900802300

1. Insert a needle or an equivalent tool into the spray hole of the rear washer nozzle and adjust the nozzle direction as shown.



B3E0919W137

REAR WASHER NOZZLE CLEANING

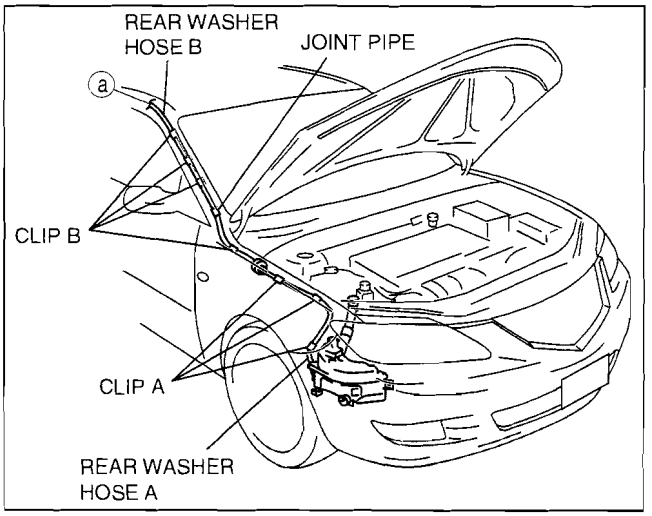
id091900803900

1. Clean the rear washer nozzle. (See 09-19-9 WINDSHIELD WASHER NOZZLE CLEANING.)

REAR WASHER HOSE REMOVAL/INSTALLATION

id091900801600

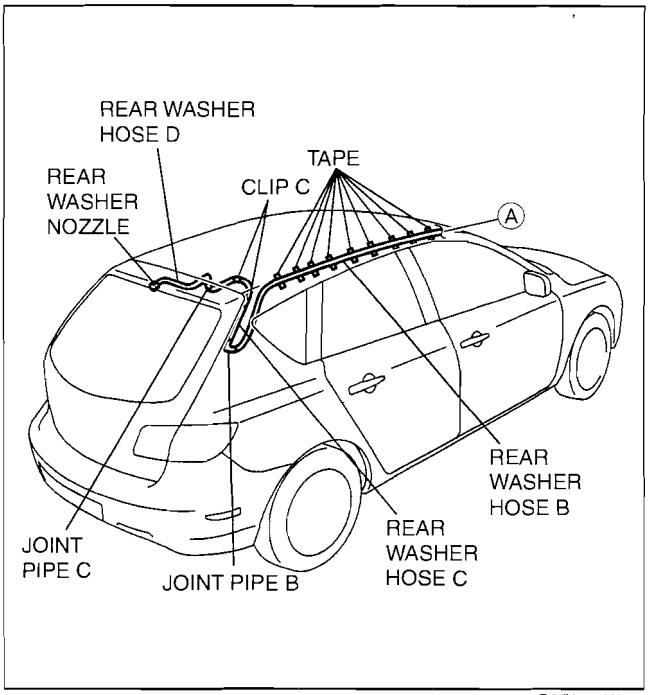
1. Disconnect the negative battery cable.
2. Slightly bend back the mudguard (RH).
3. Disconnect the rear washer hose A from the washer tank.
4. Remove rear washer hose A from clips A.
5. Remove A-pillar trim (RH). (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
6. Remove the glove compartment. (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION)
7. Remove the dashboard garnish. (See 09-17-13 DASHBOARD GARNISH REMOVAL/INSTALLATION)
8. Disconnect joint pipe, then remove the rear washer hose A.
9. Remove rear washer hose B from the clips B.
10. Remove the following parts:
    (1) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
    (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
    (3) Rear scuff plate (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
    (4) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
    (5) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
    (6) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
    (7) Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)



c3u0919w138

(8) Trunk side upper trim (See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
(9) C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
(10)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
(11)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
(12)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)

11. Disconnect the joint pipe B.
12. Remove the headliner. (See 09-17-24 HEADLINER REMOVAL/INSTALLATION)
13. Remove rear washer hose B and the tapes.
14. Remove clips C from the body.
15. Disconnect the joint pipe C, then remove rear washer hose C.
16. Remove rear washer hose D from the rear washer nozzle.
17. Install in the reverse order of removal.



B3E0919W139

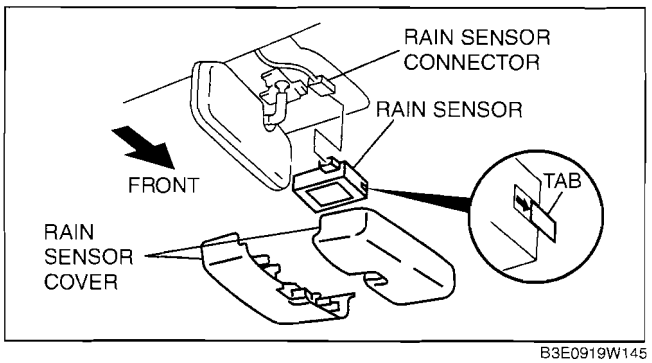
RAIN SENSOR REMOVAL/INSTALLATION

id091900800500

Caution

- **If the ignition switch is turned to the ON position after replacing a rain sensor with a new one, the rain sensor determines that there is no raindrops or dirt on the windshield and performs the initial setting. When replacing a rain sensor with a new one, thoroughly wipe off raindrops and dirt from the windshield.**

1. Disconnect the negative battery cable.
2. Remove the rain sensor cover.
3. Disconnect the rain sensor connector.
4. Slide the tab in the direction of the arrow and remove the rain sensor.
5. Install in the reverse order of removal.



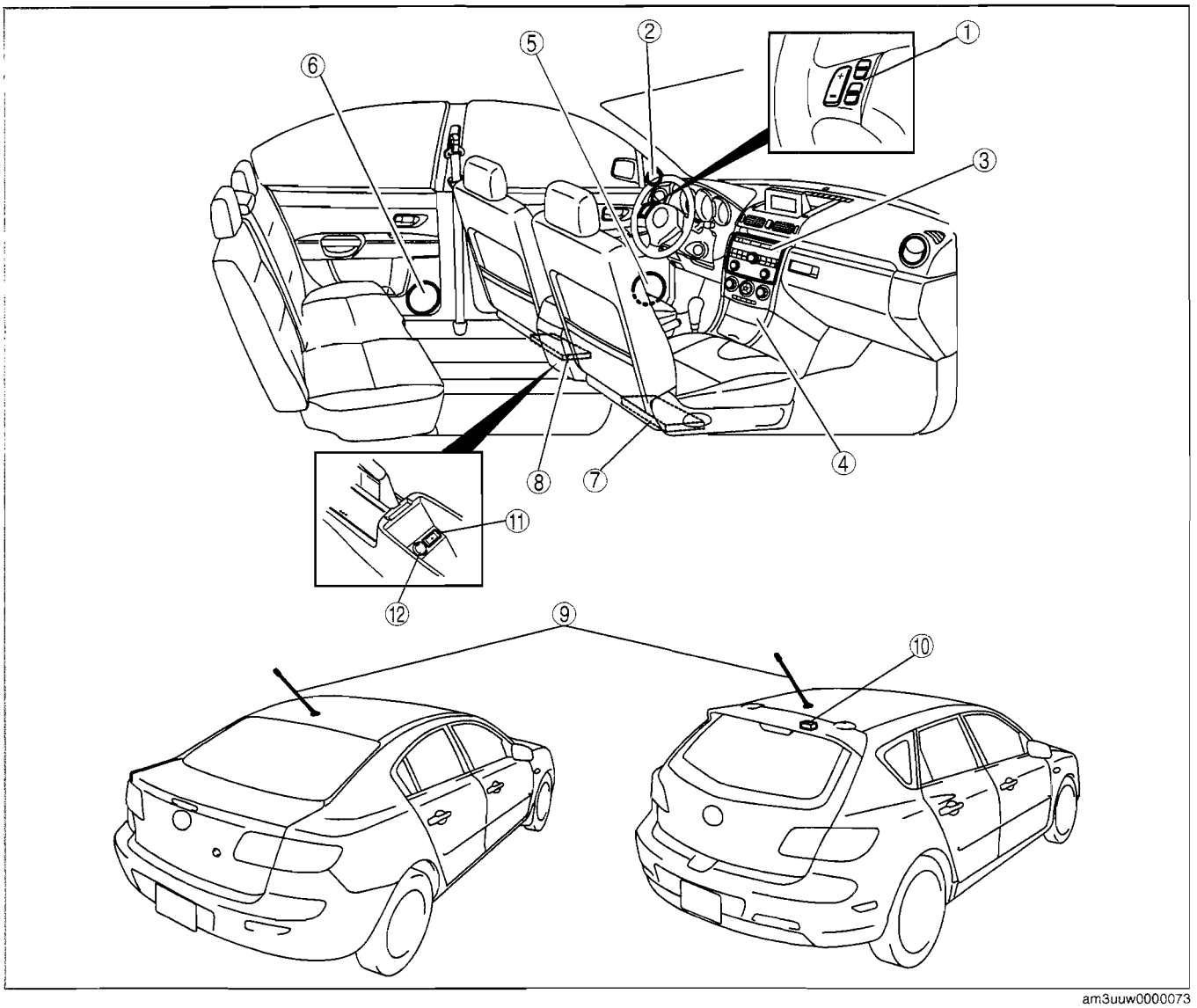
B3E0919W145

09-20 ENTERTAINMENT

ENTERTAINMENT LOCATION INDEX

id092000800100

Audio System



am3uuw0000073

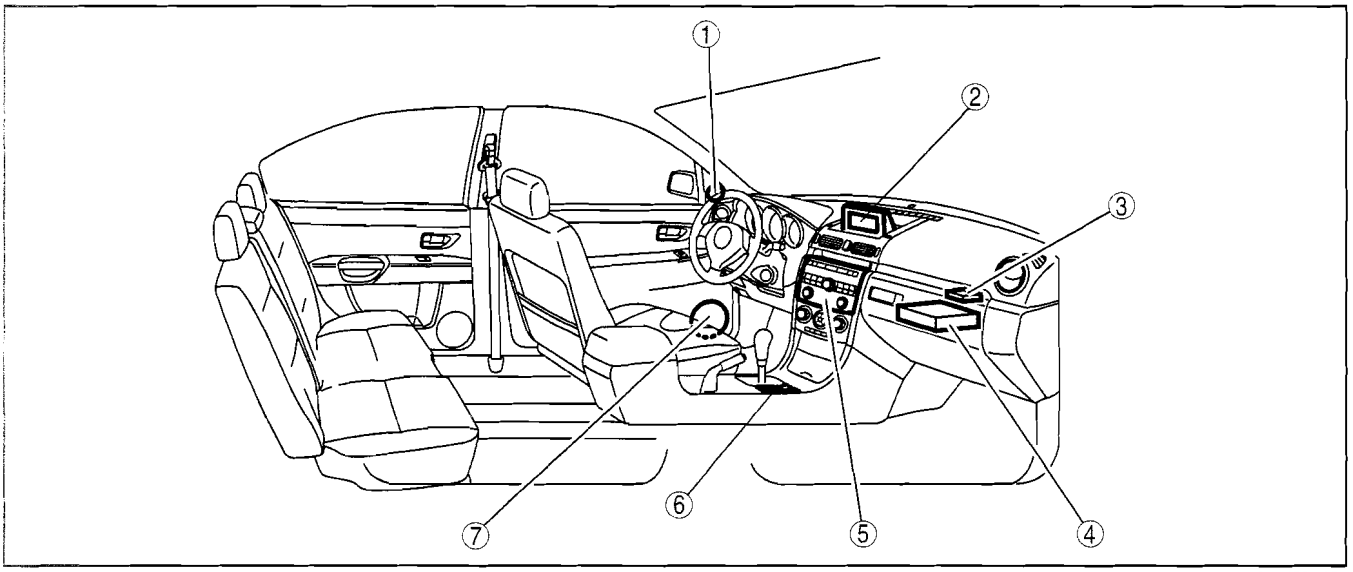
1	Audio control switch (See 09-20-14 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION) (See 09-20-15 AUDIO CONTROL SWITCH INSPECTION)
2	Front tweeter (See 09-20-9 FRONT TWEETER REMOVAL/ INSTALLATION) (See 09-20-9 FRONT TWEETER INSPECTION)
3	Center panel module (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY)
4	Cigarette lighter (See 09-20-16 CIGARETTE LIGHTER REMOVAL/ INSTALLATION) (See 09-20-17 CIGARETTE LIGHTER INSPECTION)

5	Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION) (See 09-20-8 FRONT DOOR SPEAKER INSPECTION)
6	Rear door speaker (See 09-20-8 REAR DOOR SPEAKER REMOVAL/ INSTALLATION) (See 09-20-9 REAR DOOR SPEAKER INSPECTION)
7	Woofer (Bose) (See 09-20-10 WOOFER REMOVAL/ INSTALLATION) (See 09-20-10 WOOFER INSPECTION)
8	Audio amplifier (Bose) (See 09-20-7 AUDIO AMPLIFIER REMOVAL/ INSTALLATION)

9	Center roof antenna (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION) (See 09-20-12 CENTER ROOF ANTENNA INSPECTION) (See 09-20-13 ANTENNA FEEDER LOCATION) (See 09-20-14 FRONT ANTENNA FEEDER INSPECTION) (See 09-20-14 REAR ANTENNA FEEDER INSPECTION)

10	Condenser (See 09-20-11 CONDENSER REMOVAL/ INSTALLATION)
11	Auxiliary jack (See 09-20-18 AUXILIARY JACK REMOVAL/ INSTALLATION)
12	Accessory socket (See 09-20-18 ACCESSORY SOCKET REMOVAL/ INSTALLATION) (See 09-20-18 ACCESSORY SOCKET INSPECTION)

Car-navigation System



c3u0920w104

1	Front tweeter (See 09-20-9 FRONT TWEETER REMOVAL/ INSTALLATION) (See 09-20-9 FRONT TWEETER INSPECTION)
2	LCD unit (See 09-20-6 LCD UNIT REMOVAL/ INSTALLATION)
3	GPS antenna (See 09-20-13 GPS ANTENNA REMOVAL/ INSTALLATION)
4	Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/ INSTALLATION)

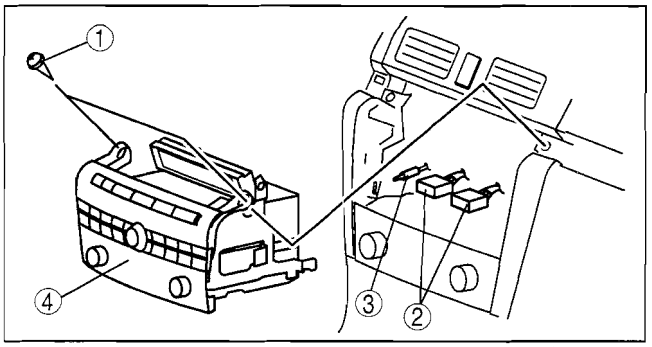
5	Center panel module (See 09-20-4 CENTER PANEL UNIT REMOVAL/ INSTALLATION) (See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY) (See 09-20-5 AUDIO UNIT DISASSEMBLY/ ASSEMBLY)
6	Car-navigation control switch (See 09-20-15 CAR-NAVIGATION CONTROL SWITCH REMOVAL/INSTALLATION) (See 09-20-16 CAR-NAVIGATION CONTROL SWITCH INSPECTION)
7	Front door speaker (See 09-20-7 FRONT DOOR SPEAKER REMOVAL/ INSTALLATION) (See 09-20-8 FRONT DOOR SPEAKER INSPECTION)

CENTER PANEL UNIT REMOVAL/INSTALLATION

id092000800600

1. Disconnect the negative battery cable.
2. Remove the decoration panel. (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Antenna feeder
4	Center panel unit (See 09-20-4 Center Panel Unit Removal Note.)



am3zzw0000138

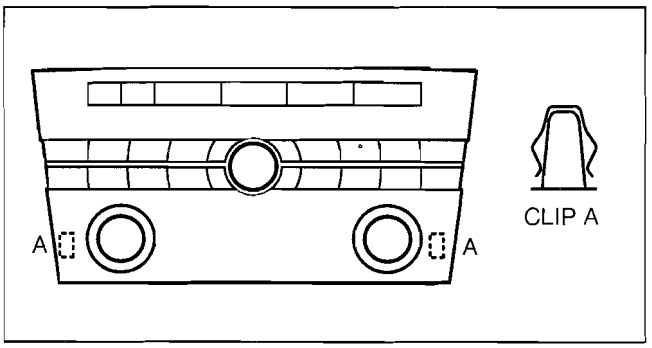
4. Install in the reverse order of removal.

Caution

- **When installing the center panel unit, make sure that the wiring harness and antenna feeder are not caught between the unit and dashboard.If the wiring harness or the antenna feeder is caught between the unit and dashboard, it may cause malfunctions.**

Center Panel Unit Removal Note

1. Pull the center panel unit outward, detach clip A from the dashboard, and then remove the center panel unit.



am3zzw0000139

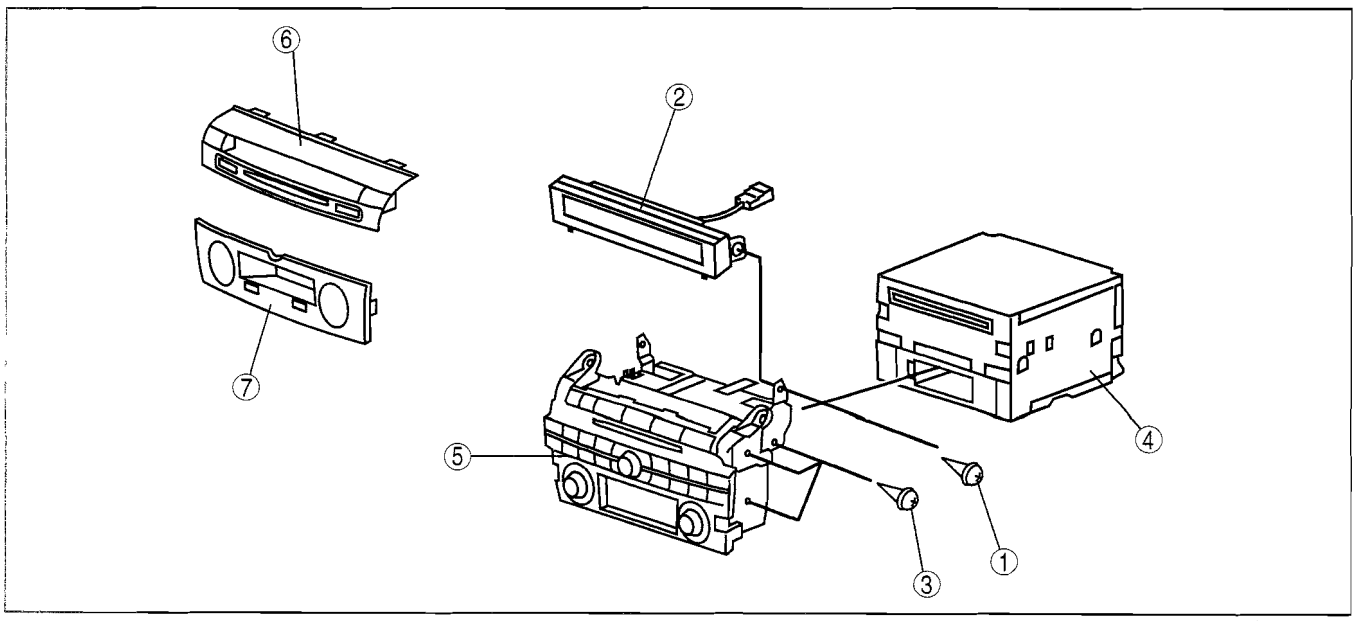
CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY

id092000800700

Caution

- **Before disassembling the center panel unit, spread a cloth on the floor to put the disassembled parts on. This protects the surface of the panel from scratches or dirt.**

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

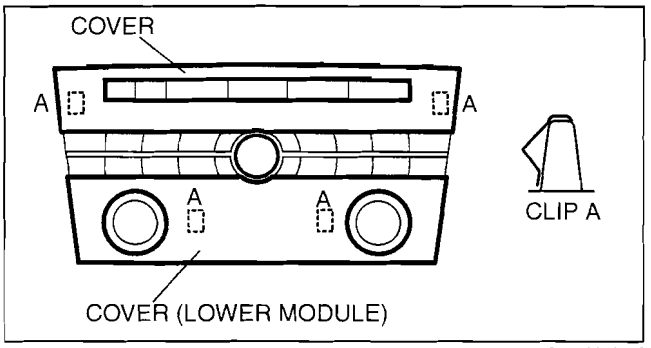


am3zzw0000139

1	Screw A
2	Information display
3	Screw B
4	Audio unit
5	Center panel
6	Cover (See 09-20-5 Cover Removal Note.)
7	Cover (lower module) (See 09-20-5 Cover Removal Note.)

Cover Removal Note

1. Pull the cover outward, detach clip A from the center panel, and then remove the cover.



am3zzw0000139

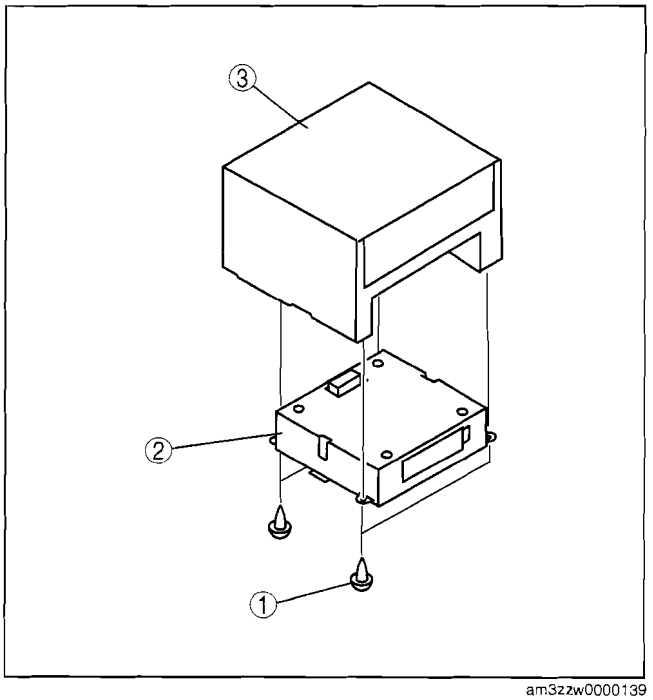
AUDIO UNIT DISASSEMBLY/ASSEMBLY

id092000800800

1. Disassemble in the order indicated in the table.

1	Screw
2	Lower module
3	Base unit

2. Assemble in the reverse order of disassembly.



am3zzw0000139

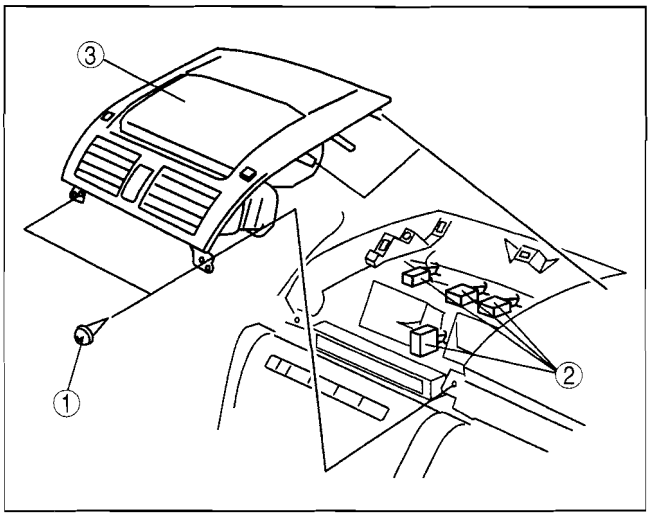
LCD UNIT REMOVAL/INSTALLATION

id092000800900

1. Disconnect the negative battery cable.
2. Remove the decoration panel. (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	LCD unit (See 09-20-6 LCD Unit Removal Note.)

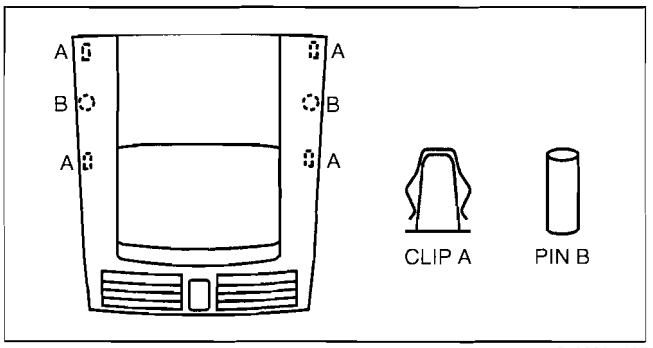
4. Install in the reverse order of removal.



am3uuw0000084

LCD Unit Removal Note

1. Pull the lower LCD unit outward, detach clip A and pin B from the dashboard, and then remove the LCD unit.



c3u0920w107

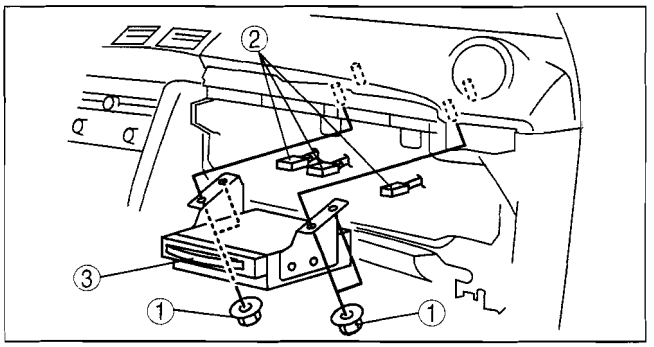
CAR-NAVIGATION UNIT REMOVAL/INSTALLATION

id092000801000

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (2) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (3) Front side trim (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Nut
2	Connector
3	Car-navigation unit

4. Install in the reverse order of removal.



B3E0920W010

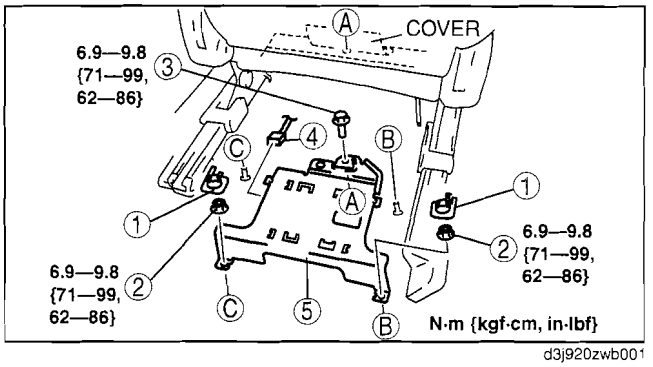
AUDIO AMPLIFIER REMOVAL/INSTALLATION

id092000801100

1. Disconnect the negative battery cable.
2. Pull the cover outward.
3. Remove in the order indicated in the table.

1	Nut cover
2	Nut
3	Bolt
4	Connector
5	Audio amplifier

4. Install in the reverse order of removal.



d3j920zwb001

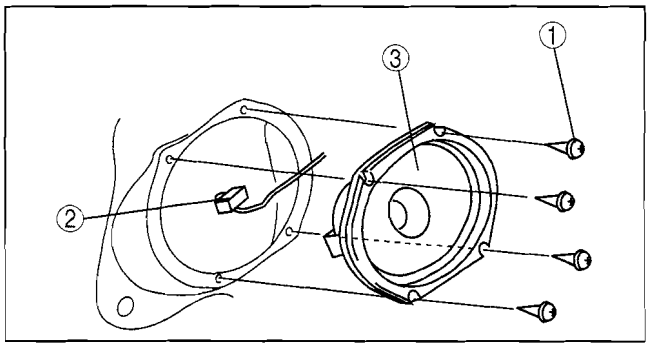
FRONT DOOR SPEAKER REMOVAL/INSTALLATION

id092000802200

1. Disconnect the negative battery cable.
2. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
3. Remove the regulator handle. (Vehicle without power window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)
4. Remove the front door trim. (See 09-17-18 FRONT DOOR TRIM REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Front door speaker (See 09-20-7 Front Door Speaker Installation Note.)

6. Install in the reverse order of removal.



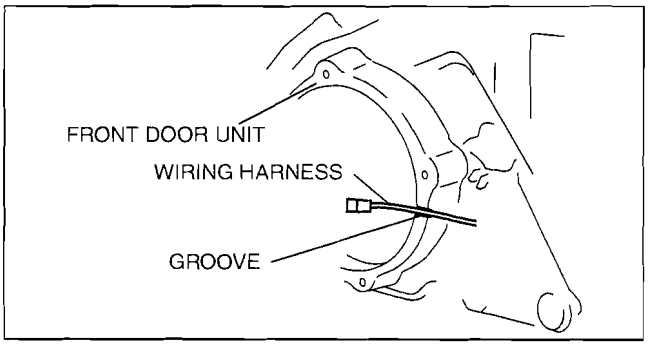
am3uuw0000084

Front Door Speaker Installation Note

1. Remove the speaker with the wiring harness passing through the groove of the front door module.

Caution

- **If the speaker is installed with the wiring harness out of the groove, an open circuit in the wiring harness could occur.**



am3uuw0000084

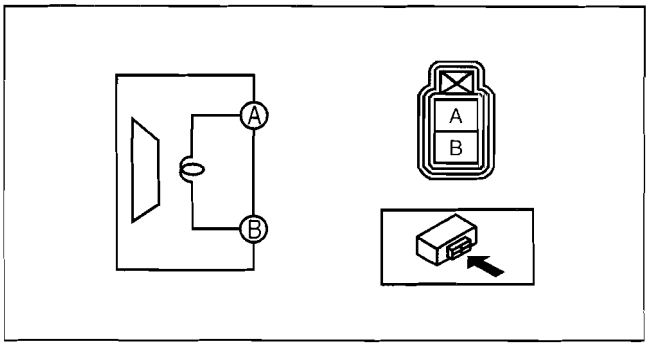
FRONT DOOR SPEAKER INSPECTION

id092000802300

1. Verify the resistance between front door speaker terminals.
   - If the resistance is not within the specification, replace the front door speaker.

   Resistance
   Standard: 4 ohms
   Bose: 2.15 ohms

2. Connect a **1.5 V** battery to the front door speaker and verify that noise is sound from the front door speaker.
   - If no sound is output, replace the front door speaker.



BHJ0920W040

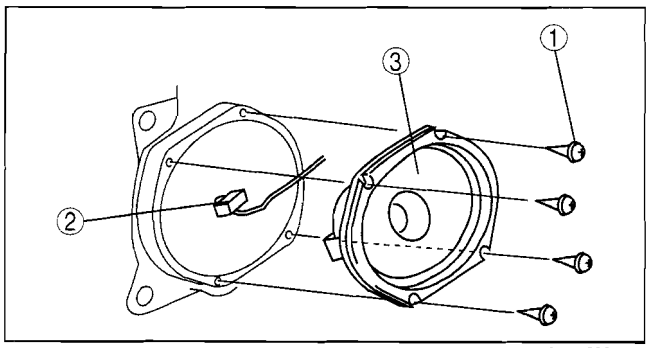
REAR DOOR SPEAKER REMOVAL/INSTALLATION

id092000805000

1. Disconnect the negative battery cable.
2. Remove the sail garnish. (5 door) (See 09-17-9 SAIL GARNISH REMOVAL/INSTALLATION.)
3. Remove the regulator handle. (Vehicle without power window system) (See 09-12-11 REGULATOR HANDLE REMOVAL.) (See09-12-12 REGULATOR HANDLE INSTALLATION.)
4. Remove the rear door trim. (See 09-17-19 REAR DOOR TRIM REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Rear door speaker (See 09-20-8 Rear Door Speaker Installation Note.)

6. Install in the reverse order of removal.

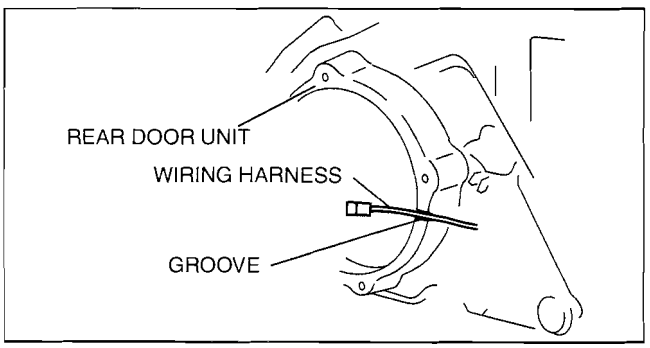


am3uuw0000085

Rear Door Speaker Installation Note

1. Remove the speaker with the wiring harness passing through the groove of the rear door module.

   Caution
   - **If the speaker is installed with the wiring harness out of the groove, an open circuit in the wiring harness could occur.**



am3uuw0000085

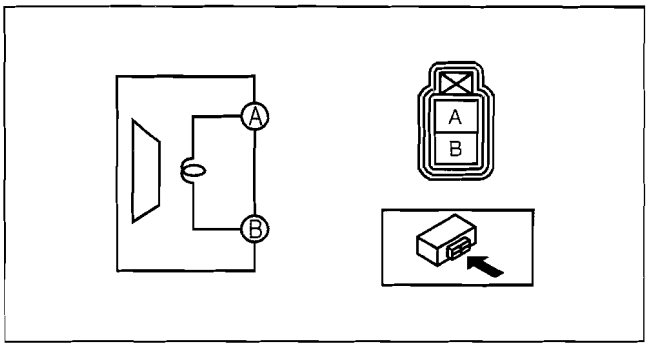
REAR DOOR SPEAKER INSPECTION

id092000804900

1. Verify the resistance between rear door speaker terminals.
   - If the resistance is not within the specification, replace the rear door speaker.

   Resistance
   Standard: 4 ohms
   Bose: 2.15 ohms

2. Connect a **1.5 V** battery to the rear door speaker and verify that noise is sound from the rear door speaker.
   - If no sound is output, replace the rear door speaker.

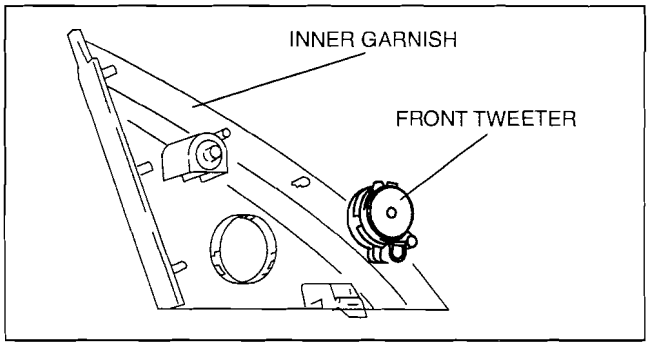


BHJ0920W040

FRONT TWEETER REMOVAL/INSTALLATION

id092000802600

1. Disconnect the negative battery cable.
2. Remove the inner garnish. (See 09-17-18 INNER GARNISH REMOVAL/INSTALLATION.)
3. Remove the front tweeter.
4. Install in the reverse order of removal.



c3u0920w113

FRONT TWEETER INSPECTION

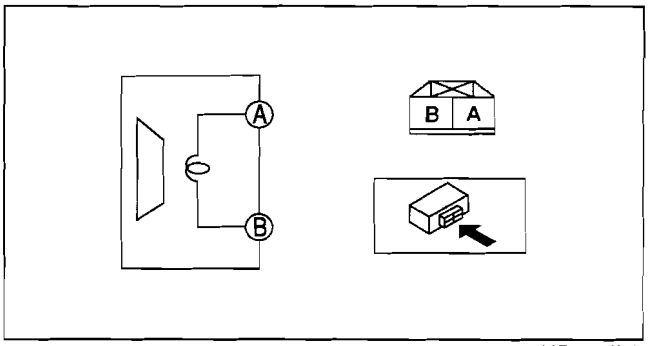
id092000802700

Standard

1. Verify the resistance between front tweeter terminals.
   - If the resistance is not within the specification, replace the front tweeter.

   Resistance
   4 ohms

2. Connect a **1.5 V** battery to the front tweeter and verify that noise is sound from the front tweeter.
   - If no sound is output, replace the front tweeter.



A6E8124W041

Bose

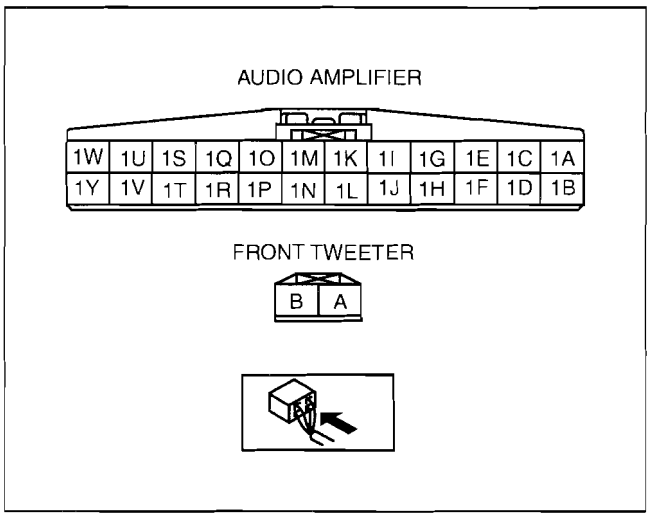
1. Verify that sound is output from the front door speaker.
   - If sound is output, go to the next step.
   - If no sound is not output, inspect the front door speaker and the related wiring harnesses.
2. Remove the following parts:
   (1) Remove the audio amplifier. (See 09-20-7 AUDIO AMPLIFIER REMOVAL/INSTALLATION)
3. Verify that the continuity between the front tweeter and the audio amplifier is as indicated in the table.
   - If the continuity is not as indicated in the table, repair or related wiring harnesses.
   - If the continuity is as indicated in the table, replace the front tweeter.

O—O: Continuity

Step	Front tweeter		Audio amplifier	
	A	B	1S (1W)	1Q (1U)
1	O		O	
2		O		O

RH (LH)

d3u913zwa011



d3u913zwa010

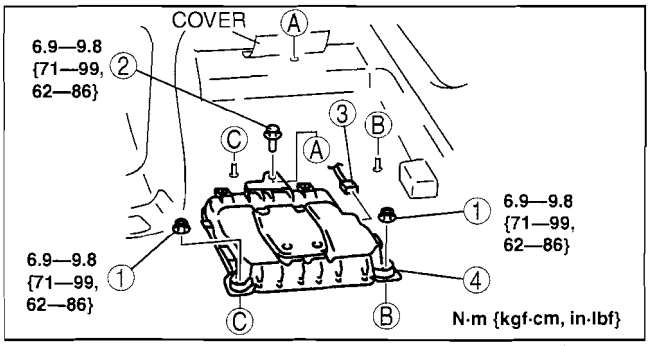
WOOFER REMOVAL/INSTALLATION

id092000805200

1. Disconnect the negative battery cable.
2. Remove the front seat. (passenger-side) (See 09-13-2 FRONT SEAT REMOVAL/INSTALLATION.)
3. Pull the cover outward.
4. Remove in the order indicated in the table.

1	Nut
2	Bolt
3	Connector
4	Woofer

5. Install in the reverse order of removal.



d3j920zwb002

WOOFER INSPECTION

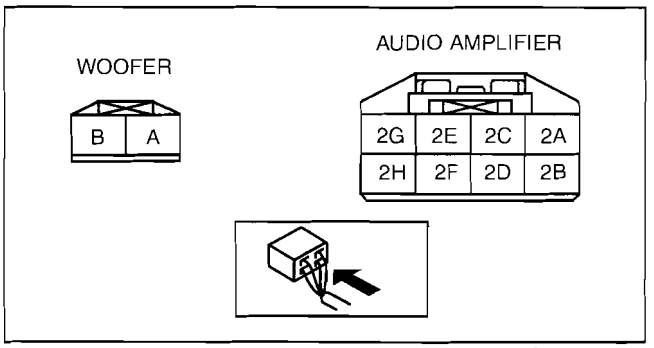
id092000805100

1. Verify that the continuity between the audio amplifier and woofer is as indicated in the table.
   - If not as specified in the table, replace the related wiring harnesses.

O—O: Continuity

Step	Terminal			
	Woofer		Audio amplifier	
	A	B	2C	2D
1	O		O	
2		O		O

D3J920ZWB004



D3J920ZWB003

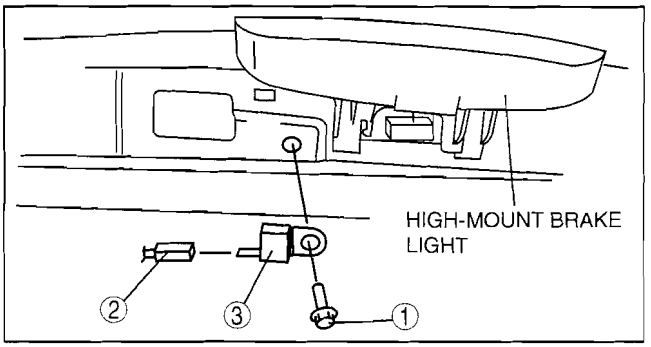
CONDENSER REMOVAL/INSTALLATION

id092000803000

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See 09-17-22 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser

4. Install in the reverse order of removal.

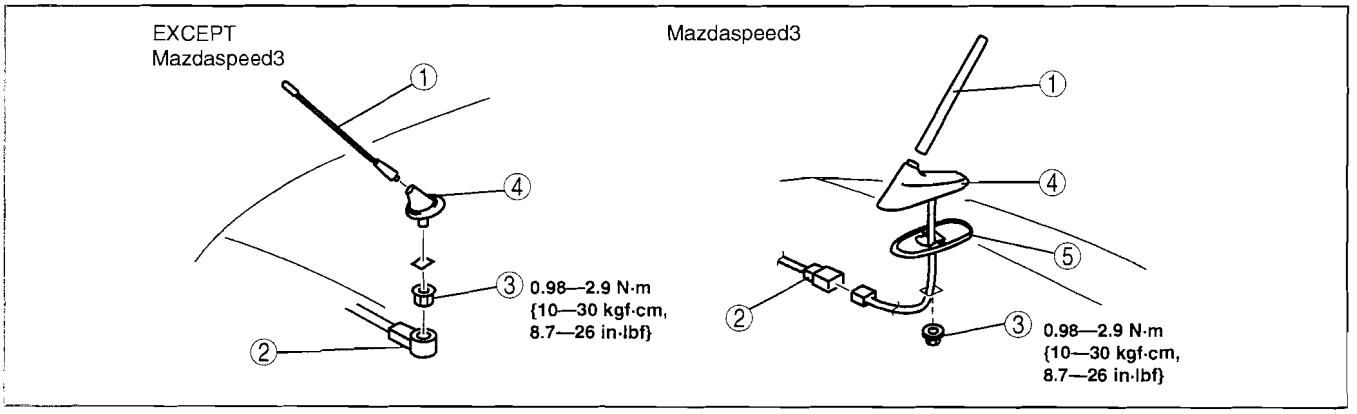


c3u0920w114

CENTER ROOF ANTENNA REMOVAL/INSTALLATION

id092000801600

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Sunroof seaming welt (Vehicles with sunroof)
   (2) Console (4 door)(See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
   (3) A-pillar trim (See 09-17-11 A-PILLAR TRIM REMOVAL/INSTALLATION.)
   (4) Upper anchor of the front seat belt (See 08-11-2 FRONT SEAT BELT REMOVAL/INSTALLATION.)
   (5) Front scuff plate (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (6) Rear scuff plate inner (See 09-17-18 REAR SCUFF PLATE REMOVAL/INSTALLATION.)
   (7) B-pillar lower trim (See 09-17-12 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION.)
   (8) B-pillar upper trim (See 09-17-12 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION.)
   (9) Rear seat (See 09-13-6 REAR SEAT REMOVAL/INSTALLATION.)
   (10)Tire house trim (See 09-17-15 TIRE HOUSE TRIM REMOVAL/INSTALLATION.)
   (11)Trunk side upper trim (5 door)(See 09-17-21 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION.)
   (12)C-pillar trim (See 09-17-13 C-PILLAR TRIM REMOVAL/INSTALLATION.)
   (13)Map light (See 09-18-23 MAP LIGHT REMOVAL/INSTALLATION.)
   (14)Sunvisor (See 09-17-23 SUNVISOR REMOVAL/INSTALLATION.)
   (15)Assist handle (See 09-17-24 ASSIST HANDLE REMOVAL/INSTALLATION.)
   (16)Headliner (See 09-17-24 HEADLINER REMOVAL/INSTALLATION.)
3. Partially peel back the headliner.
4. Remove in the order indicated in the table.



am3uuw0000015

1	Antenna rod
2	Antenna feeder (except Mazdaspeed3)
	Connector (Mazdaspeed3)
3	Nut

4	Center roof antenna
5	Rubber (Mazdaspeed3)

5. Install in the reverse order of removal.
6. After installation, verify that the rubber of the center roof antenna is installed to the roof panel with no space between them.

CENTER ROOF ANTENNA INSPECTION

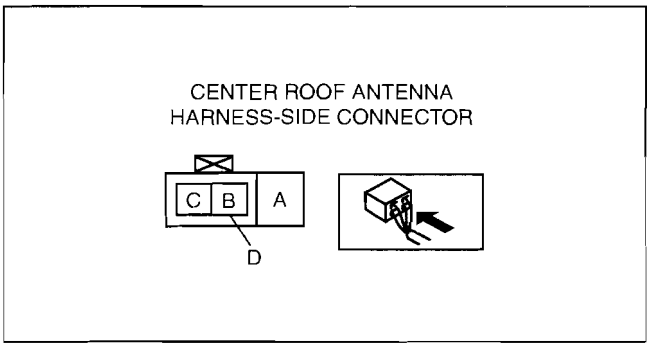
id092000801700

Mazdaspeed3

Note
- The center roof antenna has a built-in antenna amplifier.

Antenna Amplifier Inspection

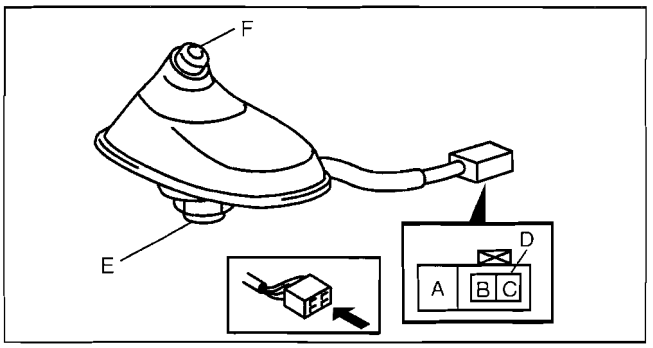
1. Turn the audio unit on and select the radio, then measure the voltage at center roof antenna connector terminal A.
- If the voltage is B+, go to the Feeder Line Inspection.
- If the voltage is not B+, inspect the audio unit or antenna feeder.



am3uuw0000015

Feeder Line Inspection

1. Verify that there is no continuity between the center roof antenna terminals A and E using an ohmmeter.
2. Inspect for continuity between the center roof antenna terminals using an ohmmeter.
   - If not as indicated in the table, replace the center roof antenna.



am3uuw0000075

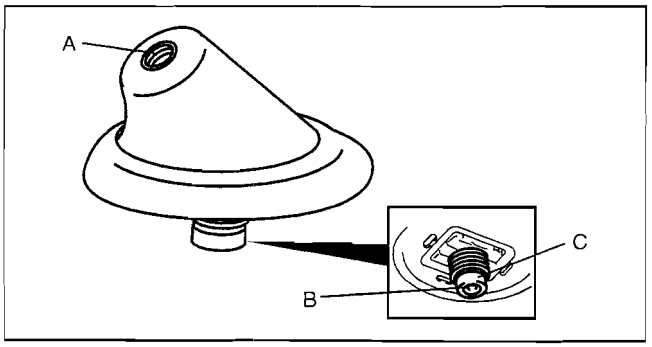
O—O: Continuity

Test condition	Terminal						Body GND
	A	B	C	D	E	F	
Under any condition			O			O	
				O	O		O

am3uuw0000075

Except Mazdaspeed3

1. Verify that there is no continuity between the center roof antenna terminals A and C.
2. Inspect for continuity between the center roof antenna terminals.
   - If not as indicated in the table, replace the center roof antenna.



am3uuw0000075

O—O: Continuity

Test condition	Terminal	
	A	B
Under any condition	O	O

am3uuw0000075

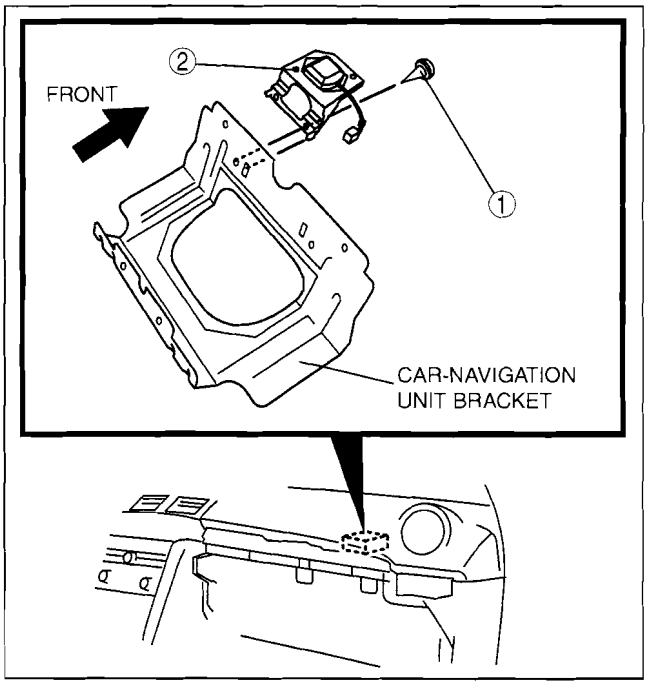
GPS ANTENNA REMOVAL/INSTALLATION

id092000801500

1. Disconnect the negative battery cable.
2. Remove the following parts:
   (1) Front scuff plate (Passenger's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Passenger's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Decoration panel (See 09-17-17 DECORATION PANEL REMOVAL/INSTALLATION.)
   (4) Glove compartment (See 09-17-7 GLOVE COMPARTMENT REMOVAL/INSTALLATION.)
   (5) Car-navigation unit (See 09-20-6 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.)
   (6) PJB (See 09-40-1 PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Screw
2	GPS antenna

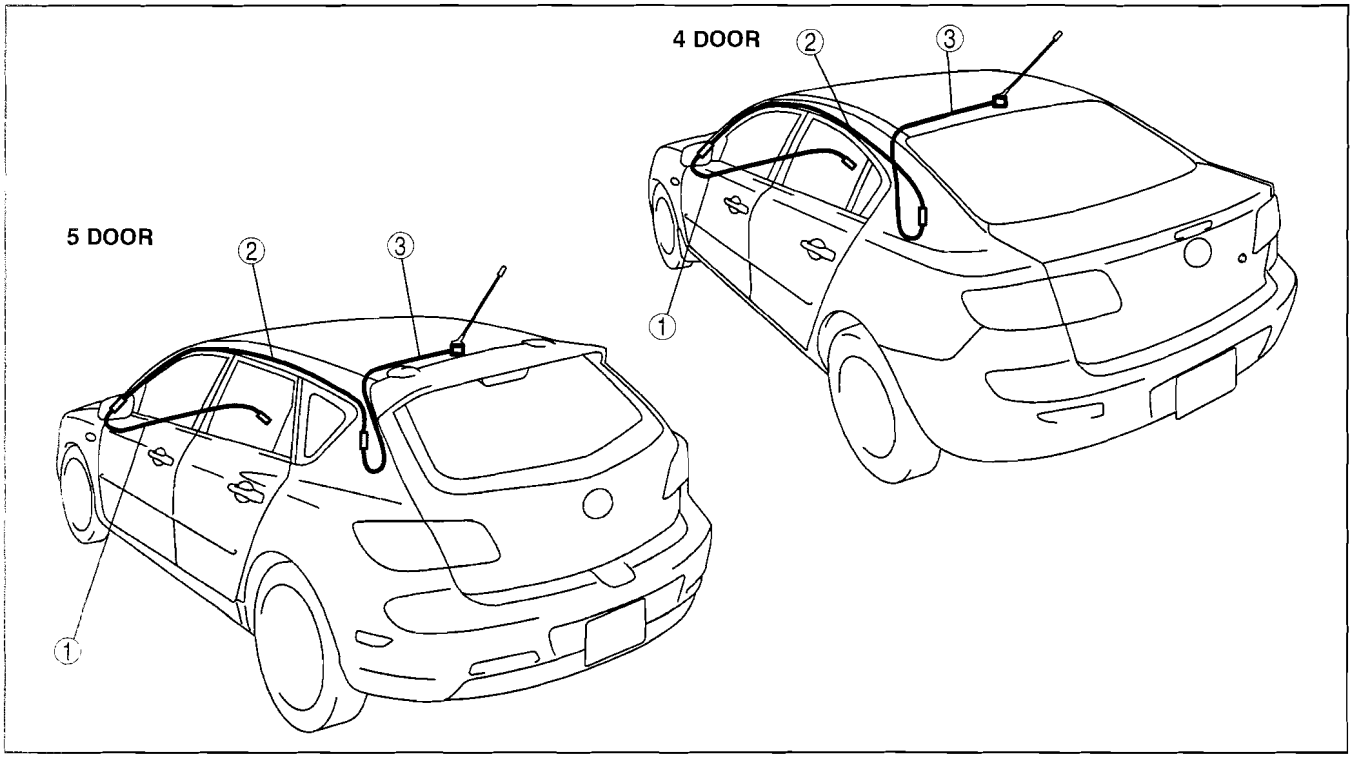
4. install in the reverse order of removal.



c3u0920w108

ANTENNA FEEDER LOCATION

id092000801800



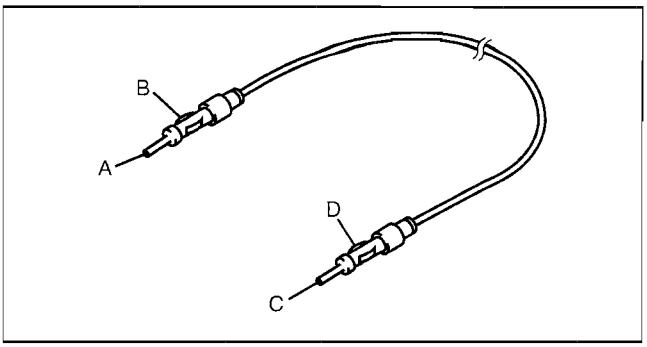
c3u0920w109

1	Front antenna feeder
2	Rear antenna feeder No.1
3	Rear antenna feeder No.2

FRONT ANTENNA FEEDER INSPECTION

id092000801900

1. Verify that there is no continuity between the front antenna feeder terminal A and B.
2. Verify that the continuity is as indicated in the table.
   - If not as indicated in the table, replace the front antenna feeder.



BHJ0920W013

O—O : Continuity

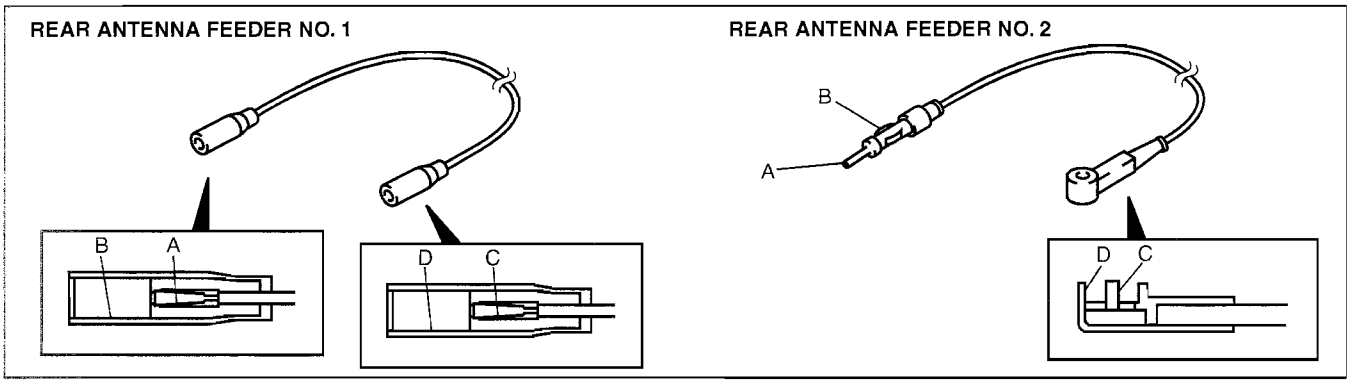
Step	Terminal			
	A	B	C	D
1	O		O	
2		O		O

CHU0920W019

REAR ANTENNA FEEDER INSPECTION

id092000802000

1. Verify that there is no continuity between the front antenna feeder terminal A and B.
2. Verify that the continuity is as indicated in the table.



c3u0920w110

- If not as indicated in the table, replace the rear antenna feeder No. 1 or No. 2.

O—O : Continuity

Step	Terminal			
	A	B	C	D
1	O		O	
2		O		O

CHU0920W019

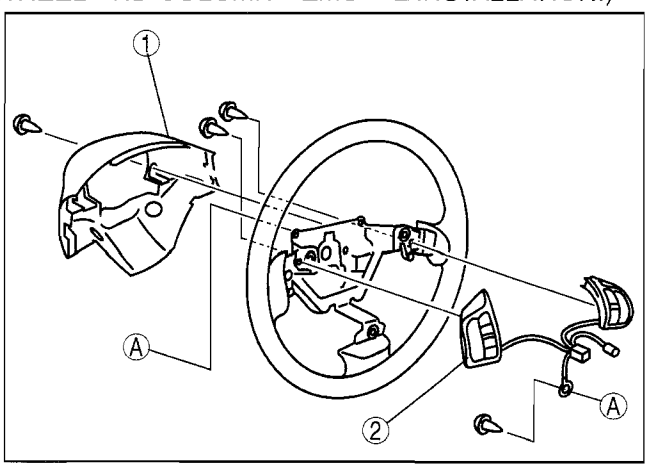
AUDIO CONTROL SWITCH REMOVAL/INSTALLATION

id092000800200

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Remove the steering wheel. (See 06-14-8 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
4. Remove in the order indicated in the table.

1	Cover
2	Audio control switch (See 09-20-15 Audio Control Switch Installation Note.)

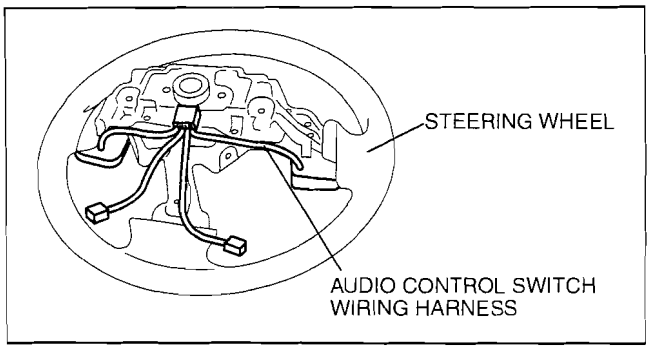
5. Install in the reverse order of removal.



c3u0920w103

Audio Control Switch Installation Note

1. Install the audio control switch so that the audio control switch wiring harness passes behind the steering wheel as shown in the figure.



am3uuw0000084

AUDIO CONTROL SWITCH INSPECTION

id092000800300

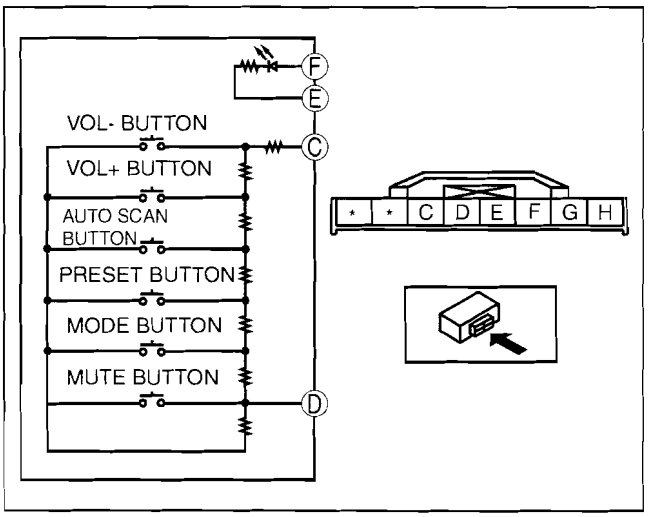
1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See 08-10-7 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
3. Disconnect the audio control switch connector.
4. Verify the resistance and continuity between the audio control switch terminals.
   - If the resistance and continuity are not as indicated in the tables, replace the audio control light switch.

Terminal			
F	E	C	D
LED		R	

c3u0920w111

R: : Resistance. See the table.

Switch position	Resistance (ohm)
VOL- button ON	51—56
VOL+ button ON	140—154
AUTO SCAN button ON	286—315
PRESET button ON	534—589
MODE button ON	985—1,080
MUTE button ON	1,940—2,130
OFF	4,800—5,290



c3u0920w102

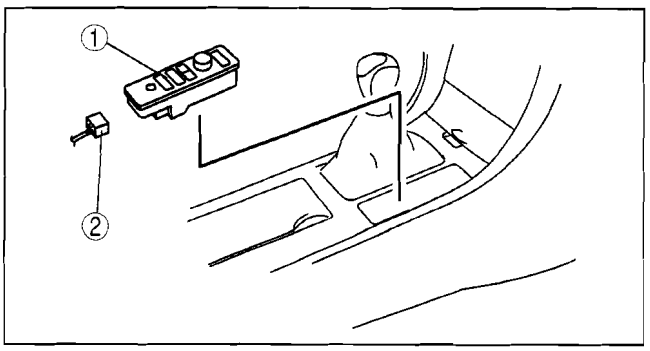
CAR-NAVIGATION CONTROL SWITCH REMOVAL/INSTALLATION

id092000801200

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Car-navigation control switch (See 09-20-16 Car-Navigation Control Switch Removal Note.)
2	Connector

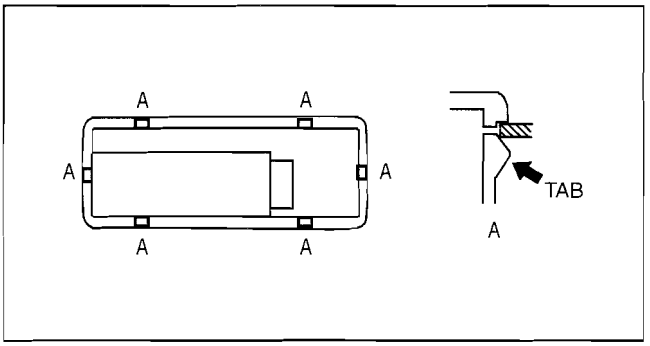
3. Install in the reverse order of removal.



am3uuw0000084

Car-Navigation Control Switch Removal Note

1. Pry the car-navigation control switch from the console using a flathead screwdriver wrapped with protective tape.

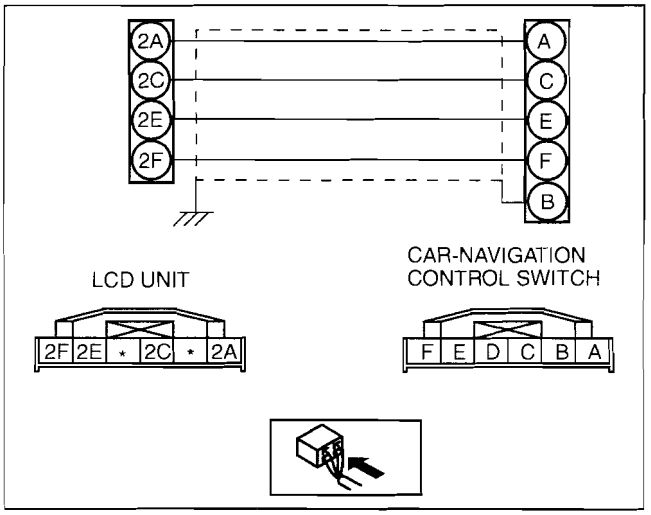


am3uuw0000084

CAR-NAVIGATION CONTROL SWITCH INSPECTION

id092000801300

1. Operate the car-navigation control switch and verify that the car-navigation system operates normally.
   - If the system does not operate normally, go to the next step.
2. Inspect the wiring harness between the LCD unit and the car-navigation control switch for an open circuit, power short, or a short to ground.
   - If there is any malfunction in the wiring harnesses, repair or replace the applicable wiring harness.
   - If the wiring harnesses are normal, replace the car-navigation control switch.



c3u0920w112

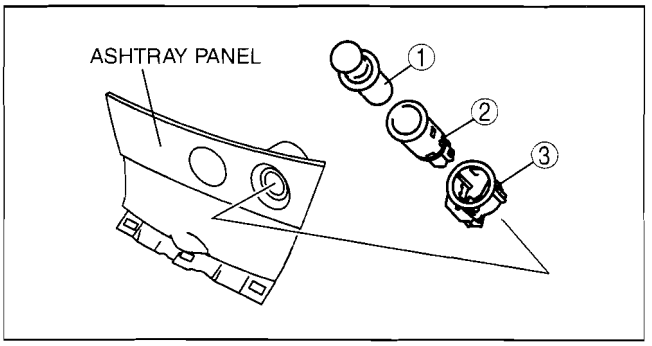
CIGARETTE LIGHTER REMOVAL/INSTALLATION

id092000803100

1. Disconnect the negative battery cable.
2. Remove the ashtray panel. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Cigarette lighter plug
2	Socket (See 09-20-17 Socket Removal Note.)
3	Ring (See 09-20-17 Ring Removal Note.)

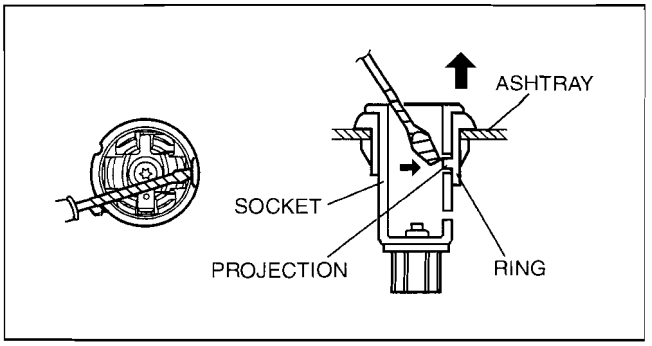
4. Install in the reverse order of removal.



am3uuw0000084

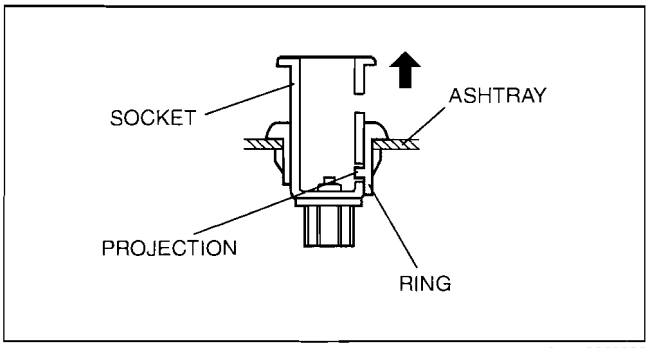
Socket Removal Note

1. Insert a tape-wrapped flathead screwdriver into the socket hole and push on the ring projection to lift the socket outward.



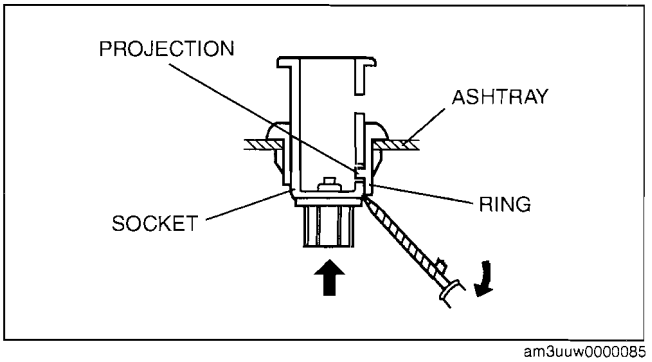
am3uuw0000085

2. Lift out the socket until the ring projection locks into the lower socket hole as shown in the figure.



am3uuw0000085

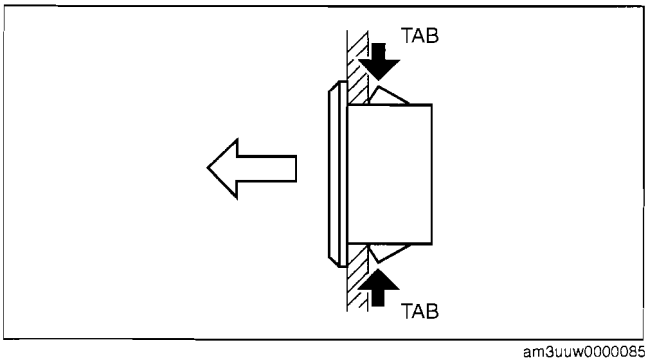
3. From the rear of the ashtray, insert a tape-wrapped flathead screwdriver between the socket and the ring as shown in the figure.
4. While lifting the ring projection with the flathead screwdriver, push out and remove the socket.



am3uuw0000085

Ring Removal Note

1. Pull the ring outward while pressing the tabs.



am3uuw0000085

CIGARETTE LIGHTER INSPECTION

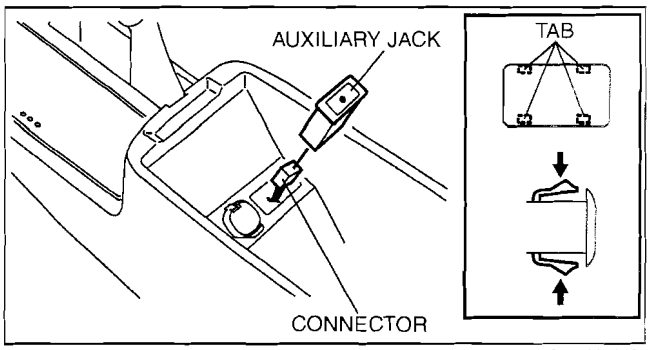
id092000803200

1. Turn the ignition switch to the ACC position.
2. Press the cigarette lighter into the socket and verify that it returns to its original position in **10—20 s**.
   - If the cigarette lighter does not operate normally, replace the cigarette lighter and the socket.

AUXILIARY JACK REMOVAL/INSTALLATION

id092000809900

1. Disconnect the negative battery cable.
2. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Disconnect the auxiliary jack connector.
4. Squeeze the tabs of auxiliary jack and pull it outward to remove it.
5. Install in the reverse order of removal.



am3zzw0000301

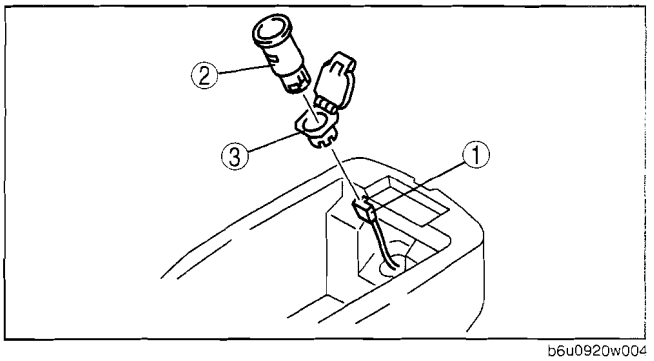
ACCESSORY SOCKET REMOVAL/INSTALLATION

id092000800400

1. Disconnect the negative battery cable.
2. Remove the console. (See 09-17-10 CONSOLE REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Socket (See 09-20-18 Socket removal note.)
3	Cap (See 09-20-18 Cap removal note.)

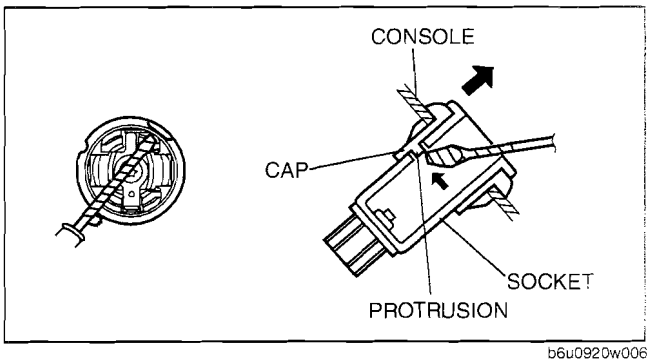
4. Install in the reverse order of removal.



b6u0920w004

Socket removal note

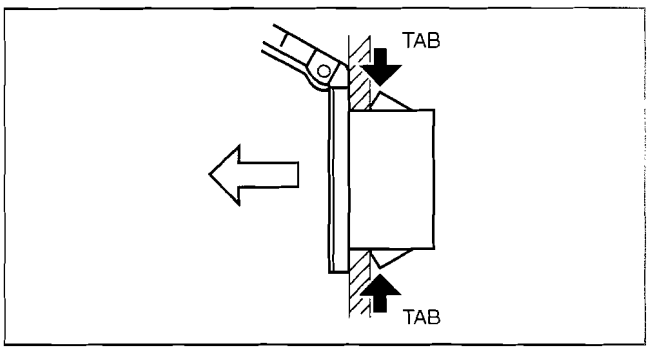
1. Remove the socket by pushing on the protrusion with a tape-wrapped flathead screwdriver inserted through the socket hole, and pulling the socket toward you.



b6u0920w006

Cap removal note

1. Pull the cap forward while squeezing the tabs.



b6u0920w007

ACCESSORY SOCKET INSPECTION

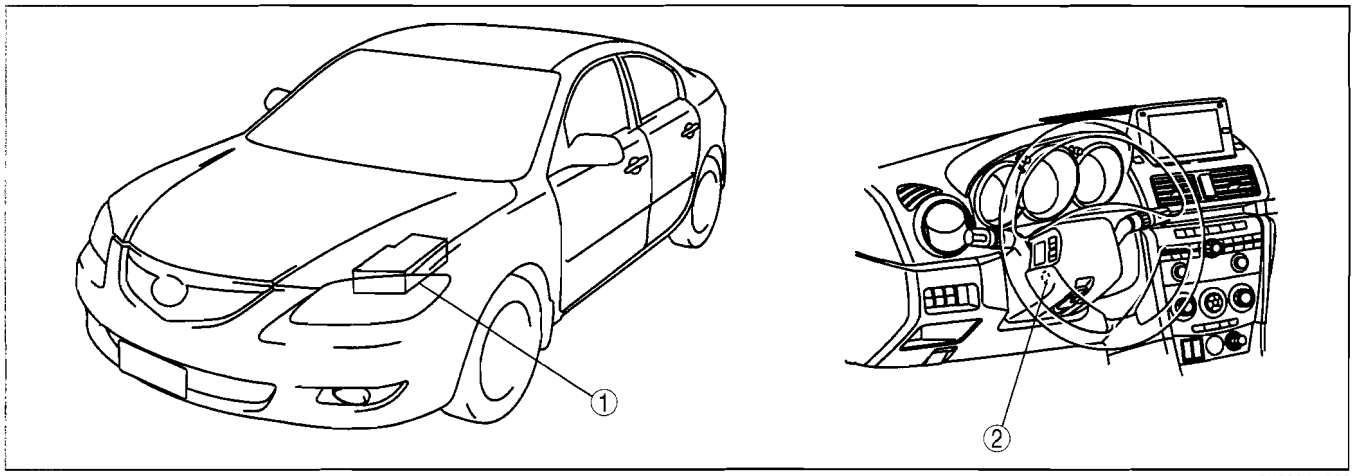
id092000800500

- See 09-20-17 CIGARETTE LIGHTER INSPECTION.

09-21 POWER SYSTEMS

POWER SYSTEM LOCATION INDEX

id092100800700



c3u0921w002

1	Main fuse block (See 09-21-3 RELAY LOCATION.) (See 09-21-3 RELAY INSPECTION.)

2	Ignition switch (See 09-21-1 IGNITION SWITCH REMOVAL/INSTALLATION) (See 09-21-2 IGNITION SWITCH INSPECTION.)

FUSE SERVICE CAUTIONS

id092100800400

Caution

- **Determine and correct the cause of the burnt fuse before replacing it with the specified type. If the fuse is replaced before doing this, it may burn again.**

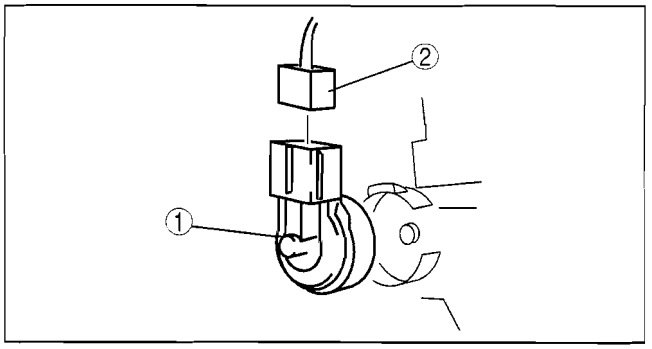
IGNITION SWITCH REMOVAL/INSTALLATION

id092100800200

1. Disconnect the negative battery cable.
2. Remove the column cover. (See 09-17-7 COLUMN COVER REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Ignition switch
2	Connector (See 09-21-2 Connector Removal Note.) (See 09-21-2 Connector Installation Note.)

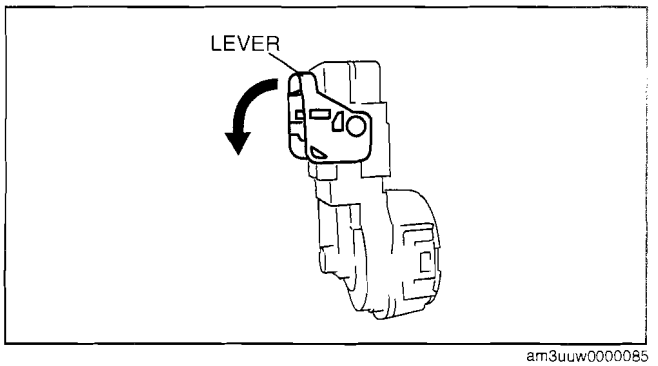
4. Install in the reverse order of removal.



am3uuw0000085

Connector Removal Note

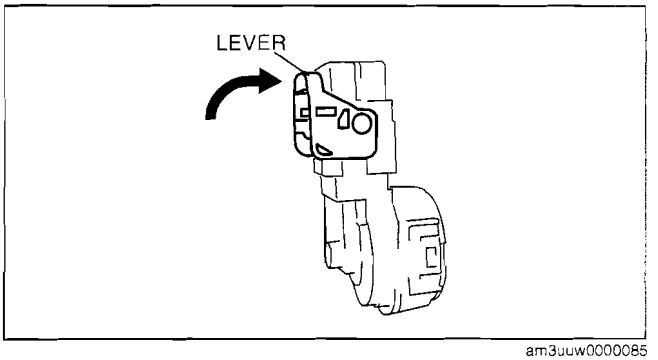
1. Rotate the lever in the direction of the arrow and remove the connector.



am3uuw0000085

Connector Installation Note

1. After connecting the connector, rotate the lever in the direction of the arrow to install the connector.



am3uuw0000085

IGNITION SWITCH INSPECTION

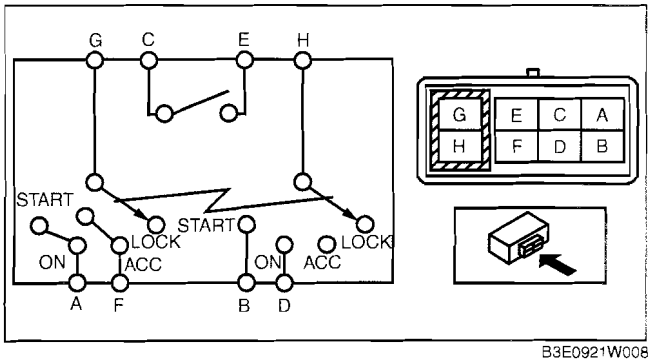
1. Verify that the continuity between the ignition switch terminals is as indicated in the table.
   - If not as indicated in the table, replace the ignition switch.

O—O: Continuity

Ignition key position	Terminal							
	A	B	C	D	E	F	G	H
LOCK								
ACC						O—O		
ON	O—O			O—O		O—O		O—O
START	O—O						O—O	
		O—O						O—O
Key inserted			O—O		O—O			
Key removed								

B3E0921W009

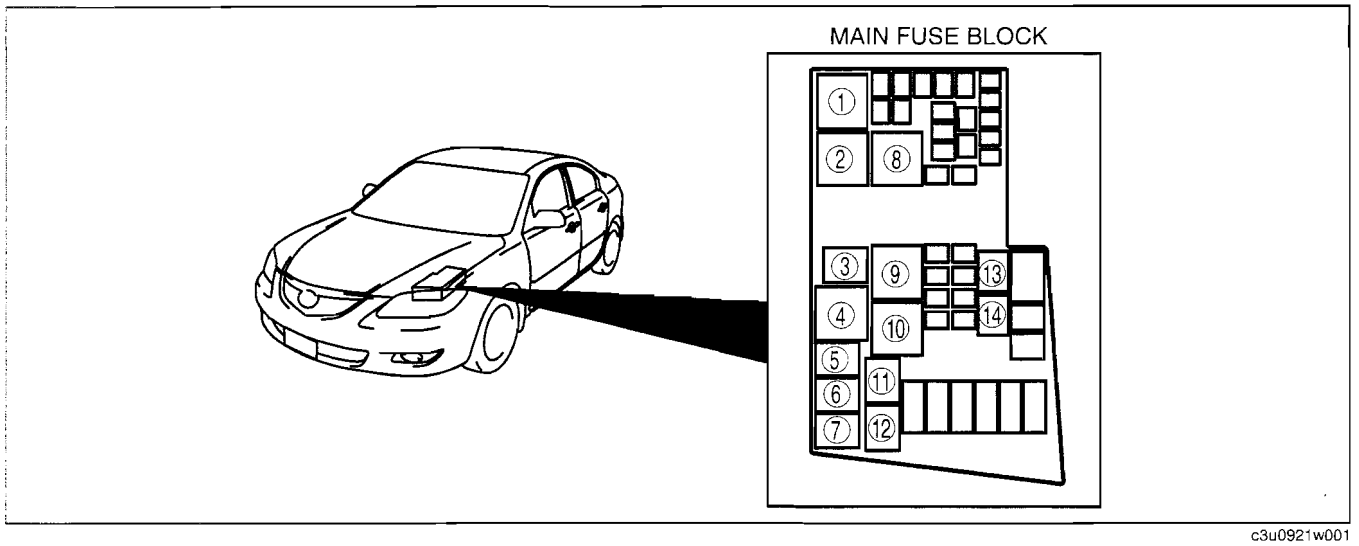
id092100800100



B3E0921W008

RELAY LOCATION

id092100800600



c3u0921w001

1	Main relay
2	Starter relay
3	A/C relay
4	Blower relay (L3 with TC)
5	Injector driver relay (L3 with TC)
	AT main relay (FS5A-EL)
6	Drive-by-wire relay
7	Horn relay
8	Rear washer relay (L3 with TC)

9	DRL relay (L3 with TC)
	Blower relay (except L3 with TC)
10	Headlight cleaner relay (L3 with TC)
	Rear washer relay (except L3 with TC)
11	Rear window defroster relay
12	Front fog light relay
13	Fuel pump relay No.2 (L3 with TC)
	DRL relay (except L3 with TC)
	Headlight cleaner relay (except L3 with TC)
14	Fuel pump relay

09-21

RELAY INSPECTION

id092100800300

Relay type

Terminal type		Part name
4 terminals	Type A	• A/C relay • AT main relay • Injector driver relay • Drive-by-wire relay • Horn relay • Rear window defroster relay • Front fog light relay • Headlight cleaner relay (except L3 with TC) • DRL relay (except L3 with TC) • Fuel pump relay • Fuel pump relay No.2
	Type B	• Main relay • Starter relay • Blower relay • Rear washer relay • DRL relay (L3 with TC) • Headlight cleaner relay (L3 with TC)

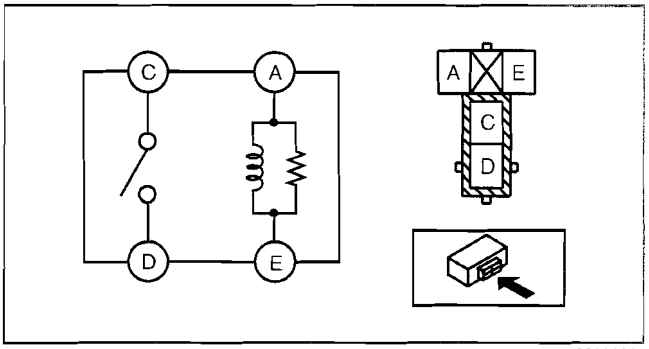
Type A

1. Verify the continuity between the relay terminals.
   - If not as indicated in the table, replace the relay.

O—O : Continuity

Step	Terminal			
	A	E	C	D
1	O	O		
2	B+	GND	O	O

am8rrw00000328



am8rrw00000327

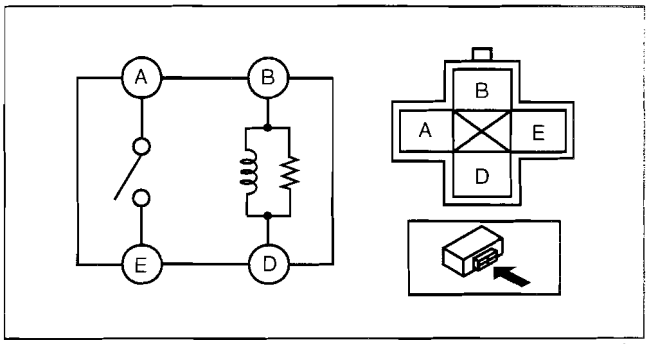
Type B

1. Verify the continuity between the relay terminals.
   - If not as indicated in the table, replace the relay.

O—O : Continuity

Step	Terminal			
	B	D	A	E
1	O	O		
2	B+	GND	O	O

am8rrw00000330

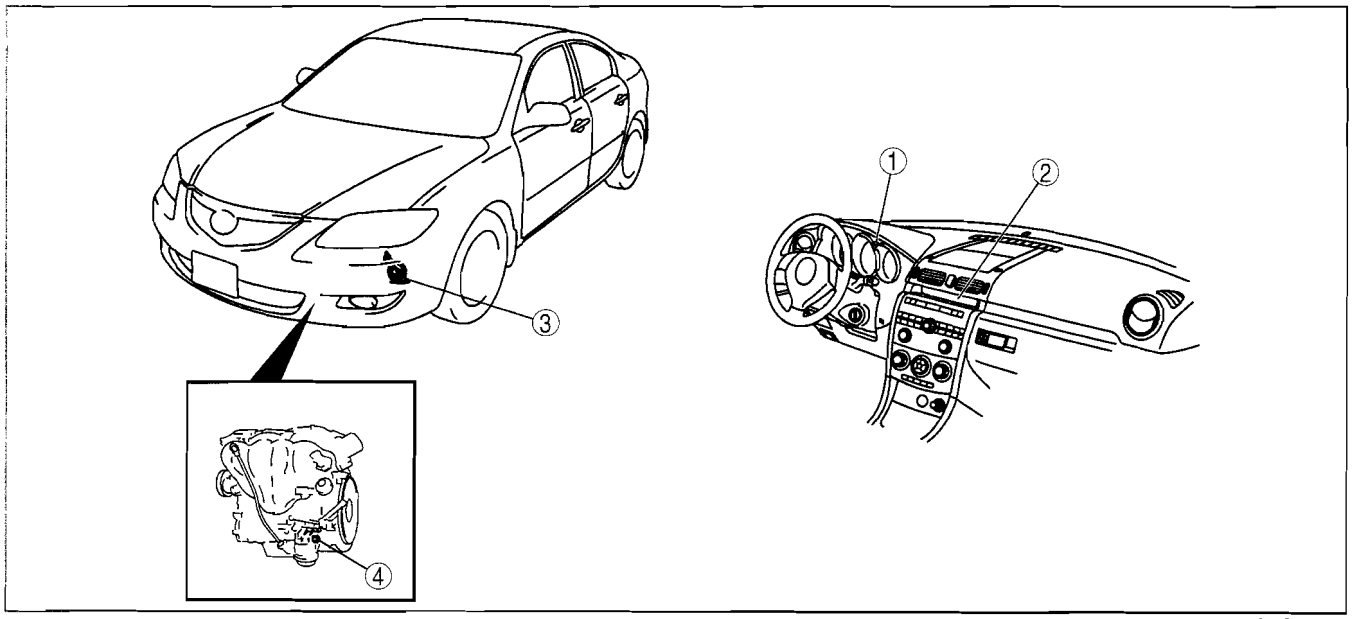


am8rrw00000329

09-22 INSTRUMENTATION/DRIVER INFO.

INSTRUMENTATION/DRIVER INFO. LOCATION INDEX

id092200801000



c3u0922w101

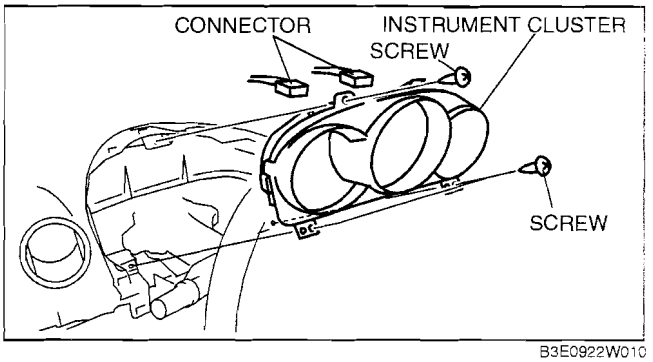
1	Instrument cluster (See 09-22-2 INSTRUMENT CLUSTER REMOVAL/INSTALLATION) (See 09-22-3 INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY) (See 09-22-4 INSTRUMENT CLUSTER INSPECTION) (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE)

2	Information display (See 09-22-12 INFORMATION DISPLAY REMOVAL/INSTALLATION)
3	Horn (See 09-22-12 HORN REMOVAL/INSTALLATION)
4	Oil pressure switch (See 09-22-11 OIL PRESSURE SWITCH INSPECTION)

INSTRUMENT CLUSTER REMOVAL/INSTALLATION

id092200800500

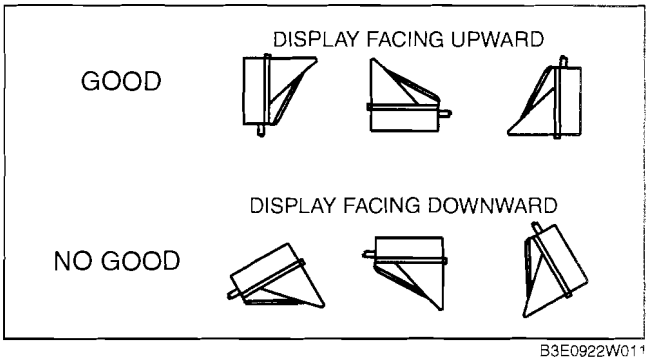
1. Perform the instrument cluster configuration when replacing it. (See 09-22-2 INSTRUMENT CLUSTER CONFIGURATION.)
2. Disconnect the negative battery cable.
3. Remove the following parts:
   (1) Front scuff plate (Driver's side) (See 09-17-18 FRONT SCUFF PLATE REMOVAL/INSTALLATION.)
   (2) Front side trim (Driver's side) (See 09-17-17 FRONT SIDE TRIM REMOVAL/INSTALLATION.)
   (3) Hood release lever (See 09-14-22 HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION.)
   (4) Lower panel (See 09-17-7 LOWER PANEL REMOVAL/INSTALLATION.)
   (5) Meter hood (See 09-17-8 METER HOOD REMOVAL/INSTALLATION.)
4. Remove the screw.
5. Remove the instrument cluster.
6. Disconnect the connector.
7. Install in the reverse order of removal.
8. When replacing the instrument cluster of vehicles with the immobilizer system, perform the following procedure:
   - 09-14-17 IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING.



B3E0922W010

Caution

- **The removed instrument cluster should be placed with the display side up to prevent grease from leaking from the meters.**



B3E0922W011

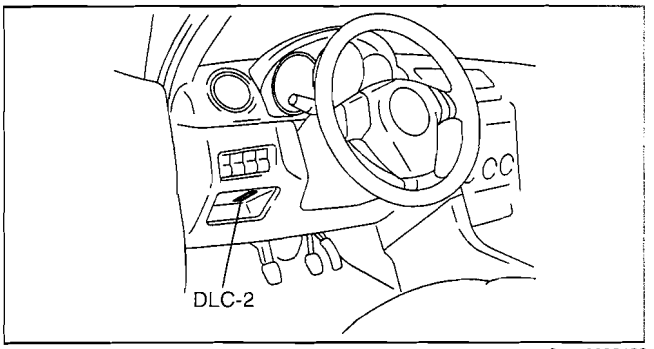
INSTRUMENT CLUSTER CONFIGURATION

id092200800300

Note

- If all the following conditions are met, the odometer data (total traveled distance) in the previous instrument cluster is automatically transferred to a new instrument cluster during the configuration. If any of the conditions are not met, odometer-data transfer cannot be performed.
  Previous instrument cluster
  — No malfunction (Configuration data can be read using the M-MDS.)
  New instrument cluster
  — Odometer display is **less than 100 km**
  — Odometer has no malfunction

1. Connect the M-MDS to the DLC-2.
2. After set up the M-MDS (including the vehicle recognition), the following can be selected from the M-MDS screen.
   When using the IDS (laptop PC):
   - "Module Programming"
   When using the PDS (Pocket PC):
   - "Programming", "Module Programming"
3. Select "Programmable Module Installation".



am3zzw0000192

4. Select "IC" and perform procedures according to directions on the M-MDS screen.
   - If odometer data is to be transferred to a new instrument cluster, perform the following procedure:
     1. Select "Programmable Parameters" from the menu.
     2. Select "Odometer Write", and perform the procedure following the screen.

Note
- During the odometer data writing procedure, As-Built Data (VIN and Vehicle Data) input is requested. Obtain the As-Built Sheet for the vehicle, and input the necessary data.

5. After the instrument cluster configuration, perform the wheel unit ID registration. (See 02-12-5 WHEEL UNIT ID REGISTRATION.)
6. Retrieve DTCs using the M-MDS and verify that there is no DTC present.
   - If any DTC is present, perform applicable DTC inspection. (See 09-02C-2 DTC TABLE[INSTRUMENT CLUSTER].)

INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY

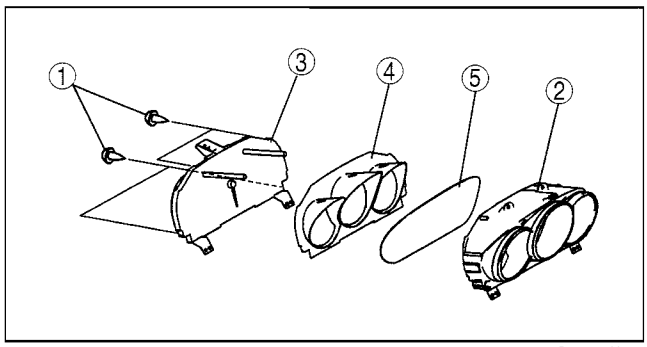
id092200801600

Caution
- **Do not drop the instrument cluster or damage the printed board. This will lead to a system malfunction.**

1. Disassemble in the order indicated in the table.

1	Screw
2	Cover
3	Instrument cluster unit
4	Hood
5	Lens

2. Assemble in the reverse order of disassembly.



B3E0922W001

INSTRUMENT CLUSTER INSPECTION

id092200800400

Speedometer

Using the input/output check mode

1. Inspect the speedometer by setting it to check code 12 of the input/output check mode. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.)

Using a speedometer tester

1. Adjust the tire pressure to the specification.
2. Using a speedometer tester, verify that the tester reading is as indicated in the table below.

Speedometer tester indication (km/h)	Allowable range (km/h)	
	L3 with TC	Except L3 with TC
20	18—22	18—22
40	38—41	38—41
60	58—62	58—62
80	77—82	78—82
100	97—102	97—102
120	117—122	117—122
140	136—143	137—142

Speedometer tester indication (mph)	Allowable range (mph)	
	L3 with TC	Except L3 with TC
10	8.6—11	8.7—11
20	19—21	19—21
30	29—31	29—31
40	39—41	39—41
50	49—51	49—51
60	59—61	59—61
70	68—72	69—71
80	78—82	78—82

3. Verify that the speedometer reading is within the range indicated in the table.
   - If the speedometer does not move or the indication is not within the allowable range, inspect the PCM and related wiring harnesses.
     — If the PCM and related wiring harnesses are normal, replace the instrument cluster.

Tachometer

Using the input/output check mode

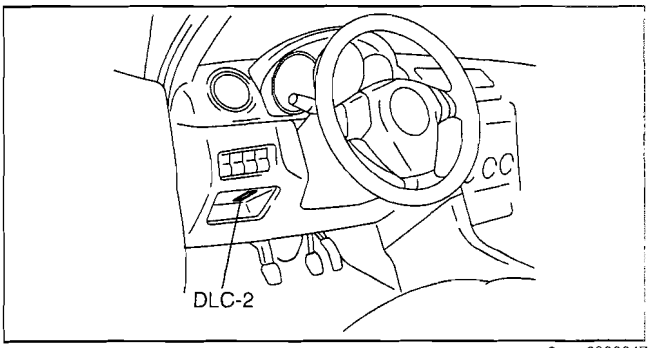
1. Inspect the tachometer by setting it to check code 13 of the input/output check mode. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.)

Using M-MDS or external diagnostic equipment

Caution

- **If the engine speed exceeds the allowable range, the engine could be damaged. Therefore, when inspecting the tachometer, do not allow the engine speed to exceed the allowable range indication on the tachometer.**

1. Connect the M-MDS to the DLC2.
2. Compare the data monitor item (RPM) with the tachometer indication.
   - If the tachometer does not operate properly, inspect the PCM and related wiring harnesses.
     — If the PCM and related harnesses do not have any malfunction, replace the instrument cluster.



am3uuw0000047

Fuel gauge

1. Inspect the fuel gauge by setting it to check code 23 of the input/output check mode. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.)

Water temperature gauge

1. Inspect the water temperature gauge by setting it to check code 25 of the input/output check mode. (See 09-22-5 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.)

INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE

id092200801700

Note

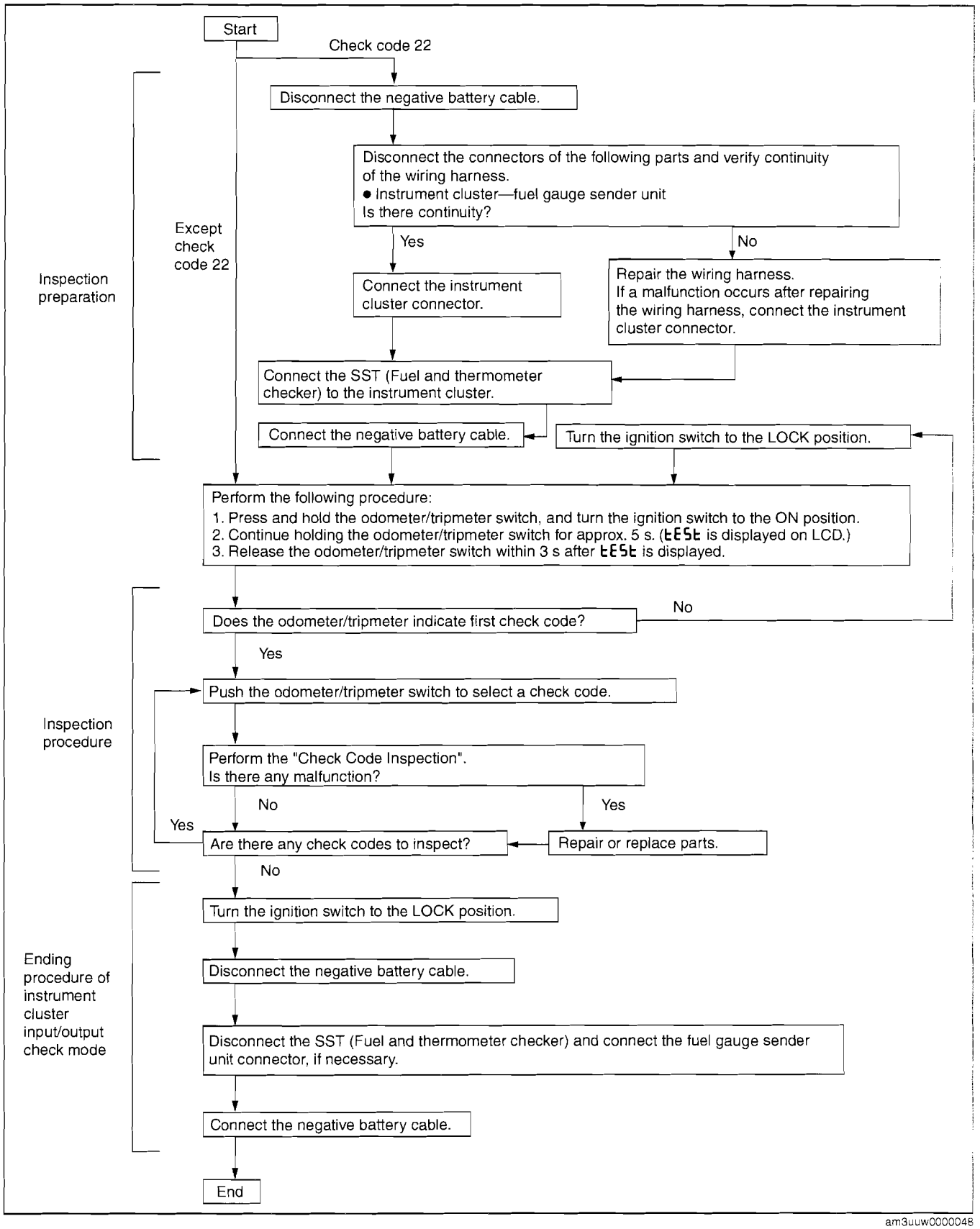
- In this mode, it is possible to verify the items in the following chart.

Check Code Table

Check code	Check item	Related items
08	TNS relay	• Lights-on reminder warning alarm • Each illumination light
12	Speedometer	Speedometer
13	Tachometer	Tachometer
14	Buzzer	Buzzer
16	Fuel-level warning light	Fuel-level warning light
22	Fuel gauge sender unit	Fuel gauge
23	Fuel gauge	Fuel gauge
25	Water temperature gauge	Water temperature gauge
26	• Odometer/tripmeter (LCD) • Warning and indicator light	• Odometer/tripmeter (LCD) • Warning and indicator light
31	Key reminder switch	Key reminder warning alarm
32	Indicator buzzer	Indicator buzzer
55	Dimmer switch	Panel light control

Note

- Check codes which are not listed may be indicated, but they cannot be inspected.
- The check codes are displayed in numerical order. (While performing the inspection, if you want to inspect a check code with a number smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)
- If a speed signal is input to the instrument cluster (the wheels are rotated) while a code other than check code 50 or 51 is displayed, the input/output check mode will be cancelled.
- The check codes can be fast-forwarded by pushing and holding the odometer/tripmeter switch for **1 s or more**.



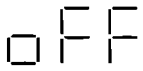
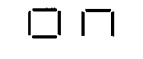
am3uuw0000048

Checking Order

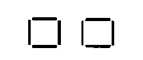
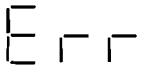
Note
- When inspecting more than two check codes, begin with the code with the highest ranking.

Priority order of inspection	Ignition switch position	Check code
1	ON	22
2		08, 12, 13, 14, 16, 23, 25, 26, 55
3	LOCK	31, 32

Check Code Inspection
Check code 08

Check code 08	TNS relay ON/OFF signal		
STEP	**INSPECTION CONDITION**	**DISPLAY**	**ACTION**
1	Turn the headlight switch to the TNS position. (TNS relay ON)		Go to the next step.
			Verify that the voltage of instrument cluster terminal 1L is **B+**. • If the voltage is as specified, replace the instrument cluster. • If the voltage is not as specified, inspect the following parts: — TNS relay — Wiring harness (Battery—TNS relay—instrument cluster)
2	Turn the headlight switch off. (TNS relay OFF)		Verify that the voltage of the instrument cluster terminal 1L is **1.0 V or less**. • If the voltage is as specified, replace the instrument cluster. • If the voltage is not as specified, inspect the following parts: — TNS relay — Wiring harness (TNS relay—instrument cluster)
			Input signal to the instrument cluster is normal.

Check code 12

Check code 12	Speedometer display signal		
INSPECTION CONDITION	**DISPLAY**	**ACTION**	
After selecting check code 12, wait for **approx. 2 s**.		The speedometer needle moves full scale then returns to **approx. 60 km/h**.	The speedometer is normal.
		Except above	Replace the instrument cluster.
		—	

Check code 13

Check code 13	Tachometer operation signal		
INSPECTION CONDITION	**DISPLAY**	**ACTION**	
After selecting check code 13, wait for **approx. 2 s**.		The tachometer needle moves full scale then returns to **approx. 3,000 rpm**.	The tachometer is normal.
		Except above	Replace the instrument cluster.
		—	

Check code 14

Check code 14	Buzzer operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 14, wait **approx. 2 s.**	01	The buzzer sounds.	The buzzer is normal.
		The buzzer does not sound.	Replace the instrument cluster.

Check code 16

Check code 16	Fuel-level warning light flashing signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 16, wait **approx. 2 s.**	01 (FLASHING)	Fuel-level warning light flashes **three times.**	The fuel-level warning light is normal.
		Except above	Replace the instrument cluster.

Check code 22

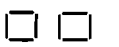
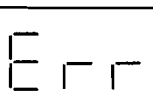
Check code 22	Fuel level signal		
STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	Select check code 22 with the fuel gauge sender unit connector disconnected.	252 | 255	Go to the next step.
		Except above	Replace the instrument cluster.
2	Connect terminals 2U and 2W of the instrument cluster.	000 | 003	Go to the next step.
		Except above	Replace the instrument cluster.
3	Using the **SST** (Fuel and thermometer checker) or resistor, input **20 ohms** between instrument cluster terminals 2U and 2W.	017 | 023	Go to the next step.
		Except above	Replace the instrument cluster.
4	Using the **SST** (Fuel and thermometer checker) or resistor, input **100 ohms** between instrument cluster terminals 2U and 2W.	097 | 103	Go to the next step.
		Except above	Replace the instrument cluster.

Check code 22	Fuel level signal		
STEP	INSPECTION CONDITION	DISPLAY	ACTION
5	Using the **SST** (Fuel and thermometer checker) or resistor, input **200 ohms** between instrument cluster terminals 2U and 2W.		Inspect the fuel gauge sender unit.
		Except above	Replace the instrument cluster.

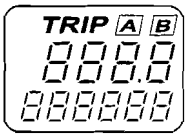
Check code 23

Check code 23	Fuel gauge operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 23, wait **approx. 2 s**.		The fuel gauge indicates status in the following order **approx. every 2 s**. • F → 1/2 → E → F (fixed)	The fuel gauge is normal.
		Except above	Replace the instrument cluster.
		Replace the instrument cluster.	

Check code 25

Check code 25	Water temperature gauge operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 25, wait approx. **2 s**.		The water temperature gauge indicates status in the following order **approx. every 2 s**. • H → Center → C → H (fixed)	The water temperature gauge is normal.
		Except above	Replace the instrument cluster.
		Replace the instrument cluster.	

Check code 26

Check code 26	Odometer/tripmeter display signal		
INSPECTION CONDITION	**DISPLAY**	**ACTION**	
Select check code 26.		• Display is normal. • Warning and indicator light illuminated. — Generator warning light — AT warning light — ABS warning light — DSC indicator light — DSC OFF light — Brake system warning light — Selector indicator light — MIL — EHPAS warning light — Cruise main indicator light — Cruise set indicator light — Security light — Door ajar warning light — Air bag system warning light — Turn indicator lights — Seat belt warning light — High-beam indicator light	• The odometer/tripmeter is normal. • Warning and indicator is normal.
		Except above	Replace the instrument cluster.

Check code 31

Check code 31	Key reminder switch ON/OFF signal		
STEP	**INSPECTION CONDITION**	**DISPLAY**	**ACTION**
1	Remove the key from the steering lock, then reinsert the key into the steering lock after selecting check code 31. (The key reminder switch is on.)		Go to the next step.
			Verify that the voltage of instrument cluster terminal 2C is **B+**. • If the voltage is as specified, replace the instrument cluster. • If the voltage is not as specified, inspect the following parts: — Key reminder switch (Ignition switch) — Wiring harness (Battery—ignition switch—instrument cluster)
2	Remove the key from the steering lock. (The key reminder switch is off.)		Verify that the voltage of instrument cluster terminal 2C is **1.0 V or less**. • If the voltage is as specified, replace the instrument cluster. • If the voltage is not as specified, inspect the following parts: — Key reminder switch (Ignition switch) — Wiring harness (Ignition switch—instrument cluster)
			Input signal to the instrument cluster is normal.

Check code 32

Check code 32	Indicator buzzer		
INSPECTION CONDITION	**DISPLAY**	**ACTION**	
After selecting check code 32, wait **approx. 2 s**.		Indicator buzzer sounds **three times**.	The buzzer is normal.
		The buzzer does not sound.	Replace the instrument

Check code 55

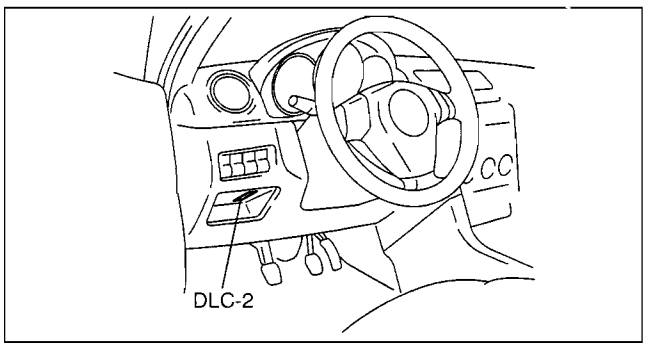
Check code 55	Dimmer switch ON/OFF signal		
STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	After selecting the check code 55, press and hold the dimmer switch. (Dimmer switch ON)	On	Go to the next step.
		oFF	Replace the instrument cluster.
2	Release the dimmer switch. (Dimmer switch OFF)	On	Replace the instrument cluster.
		oFF	Input signal to the instrument cluster is normal.

DATA MONITORING AND RECORDING PROCEDURE

id092200801500

1. Connect the M-MDS or equivalent to the DLC-2 (16-pin).
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   When using the IDS (laptop PC)
   - Select the "Toolbox" tab.
   - Select "DataLogger".
   - Select "Modules".
   - Select "IC".

   When using the PDS (Pocket PC)
   - Select "Module Tests".
   - Select "IC".
   - Select "DataLogger".
3. Verify the data monitor items.



am3zzw0000192

Indication Item Table

Monitor item	Input-output signal/part name	Unit/State		Terminal
CCNT_HE	Number of continuous DTCs	—		—
ECT_GAUGE	Water temperature gauge	°F	°C	1I, 1K
NUMKEYS	Number of key ID numbers registered with the vehicle	—		—
ODO COUNT	Odometer	m		1I, 1K
TACH	Tachometer	RPM		
SPDOMETER	Speedometer	MPH	KPH	

OIL PRESSURE SWITCH INSPECTION

id092200801200

1. Verify that the oil pressure warning light illuminates when the ignition switch is at the ON position.
2. Verify that the oil pressure warning light goes out when the engine is started.
   - If the oil pressure warning light does not illuminate or remains illuminated, inspect the related wiring harness.
     — If the related wiring harness is normal, inspect the oil pressure. (See 01-11A-3 OIL PRESSURE INSPECTION[LF, L3].)
       - If the oil pressure is normal, replace the oil pressure switch.

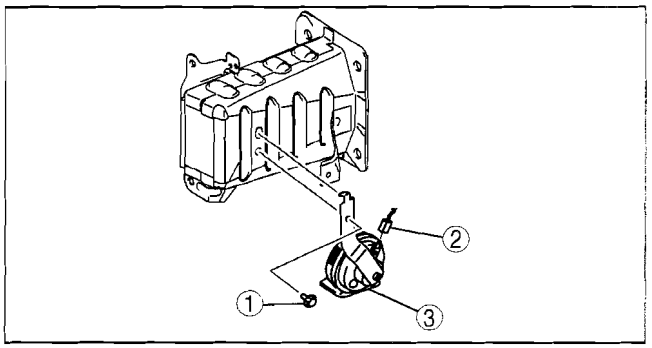
HORN REMOVAL/INSTALLATION

id092200800900

1. Disconnect the negative battery cable.
2. Slightly bend back the mudguard.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Horn

4. Install in the reverse order of removal.



c3u0922w102

INFORMATION DISPLAY REMOVAL/INSTALLATION

id092200801400

(See 09-20-4 CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.)

INFORMATION DISPLAY INPUT/OUTPUT CHECK MODE

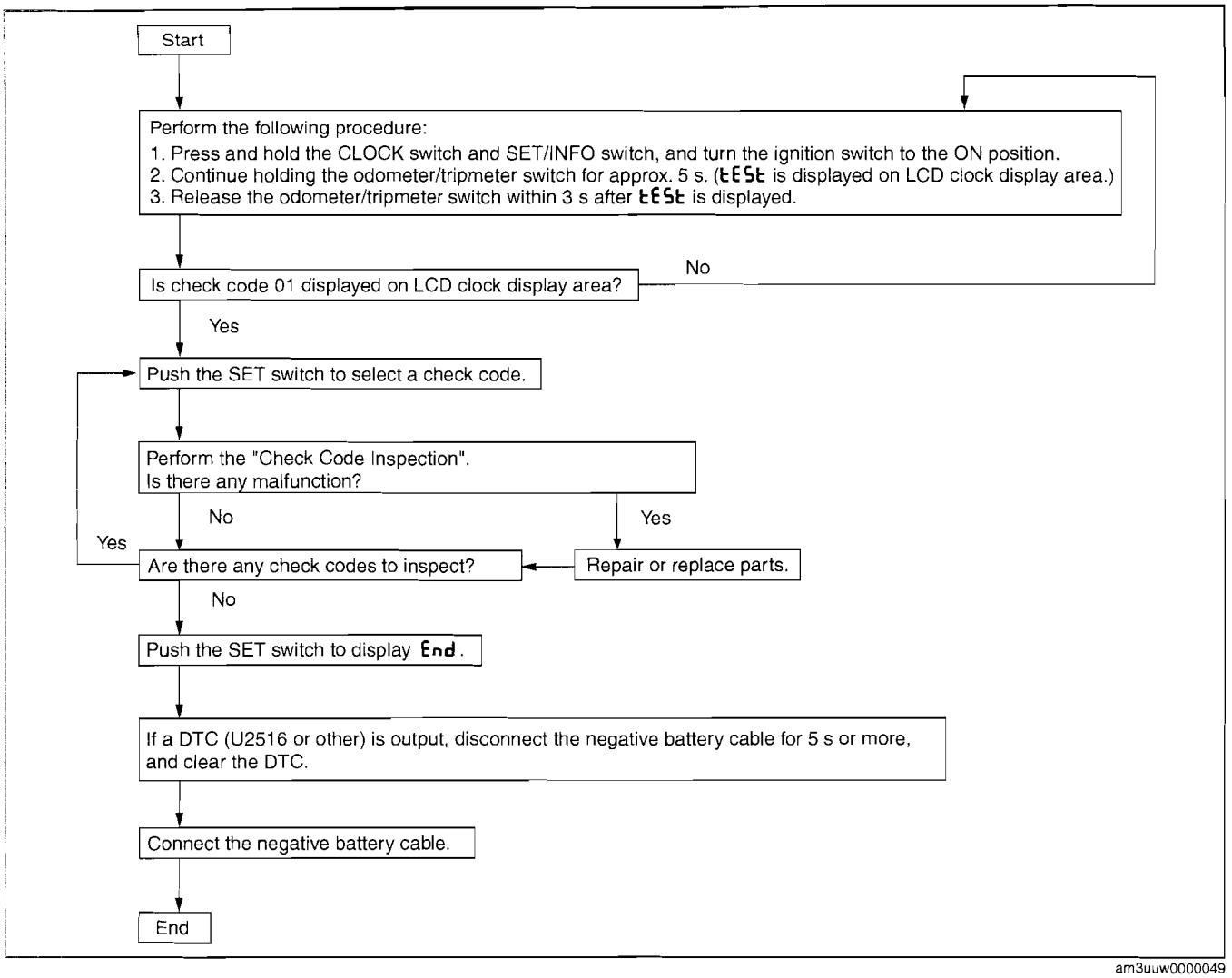
id092200801300

Note
- In this mode, it is possible to verify the items in the following chart.

Check Code Table

Check code	Check item	Related items
01	Information display	CAN system • DTC U2516: CAN system communication error
02	• Audio unit • Climate control unit • Instrument cluster	CAN system • DTCU0184: Communication error to audio unit • DTCU0164: Communication error to climate control unit • DTCU0181: Communication error to instrument cluster
04	TNS relay	• TNS relay • BCM • TNS signal wiring harness
—	LCD	LCD

Note
- The check codes are displayed in numerical order. (While performing the inspection, if you want to inspect a check code with a number smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)



am3uuw0000049

Check Code Inspection

Check code 01

Check code 01	CAN system	
INSPECTION CONDITION	**DISPLAY**	**ACTION**
Select the check code 01.	OK	CAN system of information display is normal.
	U2516	CAN system communication error. (DTC U2516) (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])

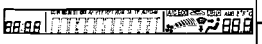
Check code 02

Check code 02	• Communication status to audio unit • Communication status to climate control unit • Communication status to instrument cluster		
INSPECTION CONDITION	**DISPLAY**		**ACTION**
Select the check code 02. (The diagnostic results will be displayed once each in the order of audio unit, heater control unit, and instrument cluster.)	Audio unit	OK ACU	Communication to audio unit is normal.
		U0184	Communication error to audio unit. (DTC U0184) (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])
		None ACU	Vehicle without audio unit.
	Climate control unit	OK ATC	Communication to climate control unit is normal.
		U0164	Communication error to climate control unit. (DTC U0164) (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])
		None ATC	Vehicle without climate control unit.
	Instrument cluster	OK MET	Communication to instrument cluster is normal.
		U0181	Communication error to instrument cluster. (DTC U0181) (See 09-02B-5 DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM])

Check code 04

Check code 04	TNS relay ON/OFF signal		
STEP	**INSPECTION CONDITION**	**DISPLAY**	**ACTION**
1	Turn the headlight switch to the TNS position. (TNS relay ON)	ON	Go to the next step.
		OFF	Verify that the voltage of information display terminal C is **B+**. • If the voltage is as specified, replace the information display. • If the voltage is not as specified, inspect the following parts: — TNS relay — Wiring harness (Battery—TNS relay—information display)
2	Turn the headlight switch off. (TNS relay OFF)	ON	Verify that the voltage of the information display terminal C is **1.0 V or less**. • If the voltage is as specified, replace the information display. • If the voltage is not as specified, inspect the following parts: — TNS relay — Wiring harness (TNS relay—information display)
		OFF	Input signal to the information display is normal.

Check code —

Check code 03	LCD		
INSPECTION CONDITION	**DISPLAY**	**ACTION**	
Select the check code 03.		All segments and dots illuminated.	LCD is normal.
		Except above	Replace the information display.

09-40 CONTROL SYSTEM

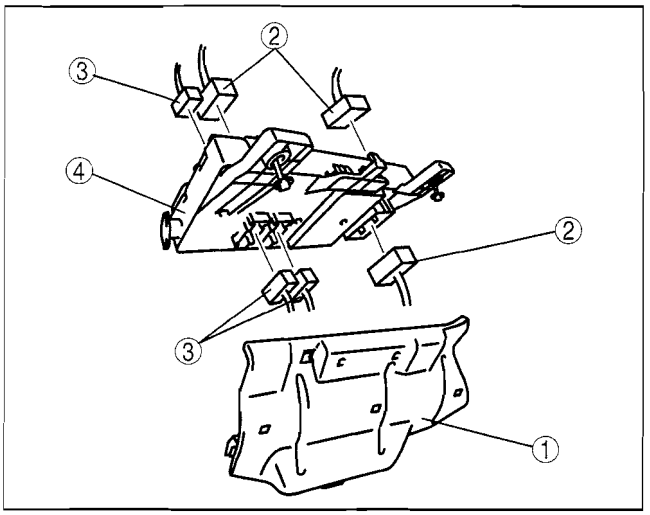
PASSENGER JUNCTION BOX (PJB) REMOVAL/INSTALLATION

id094000800700

1. When replacing the PJB, perform the following:
   - PJB configuration (See 09-40-16 PASSENGER JUNCTION BOX (PJB) CONFIGURATION.)
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.

1	Cover
2	Connector A (See 09-40-1 Connector A Removal Note.) (See 09-40-3 Connector A Installation Note.)
3	Connector B (See 09-40-2 Connector B Removal Note.) (See 09-40-2 Connector B Installation Note.)
4	PJB (See 09-40-2 PJB Removal Note.)

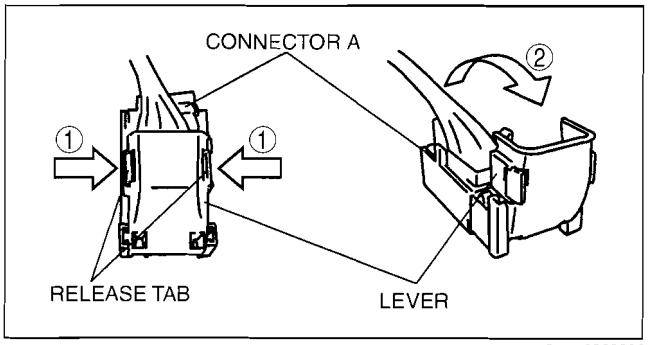
4. Install in the reverse order of removal.



am3uuw0000085

Connector A Removal Note

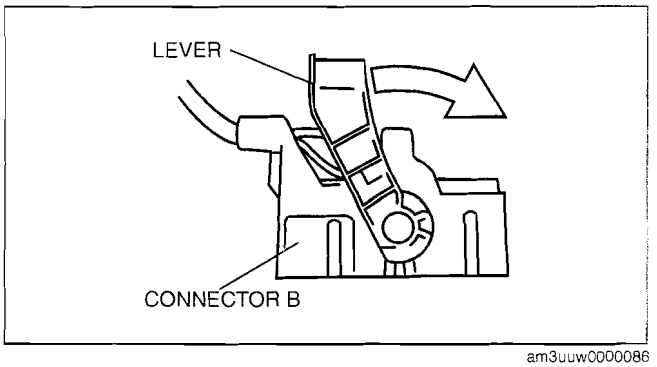
1. Push the release tab in the direction of the arrow.
2. Rotate the lever in the direction of the arrow and remove connector A.



am3uuw0000086

Connector B Removal Note

1. Rotate the lever in the direction of the arrow and remove connector B.

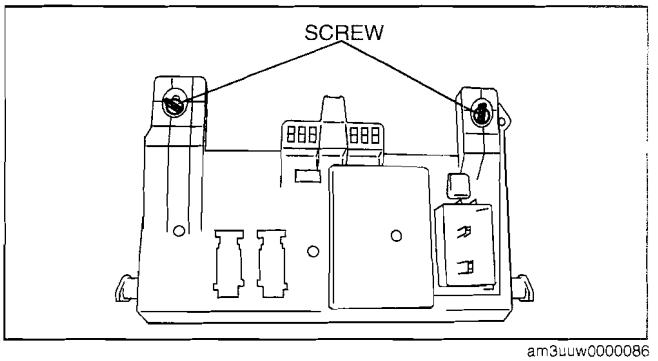


am3uuw0000086

PJB Removal Note

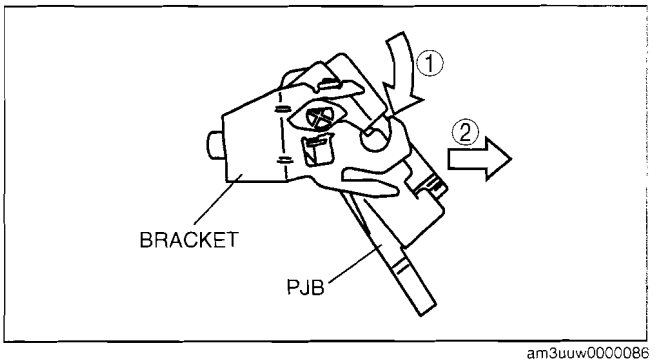
1. Turn the screws counterclockwise to remove the PJB.

Note
- Screws cannot be removed from the PJB.



am3uuw0000086

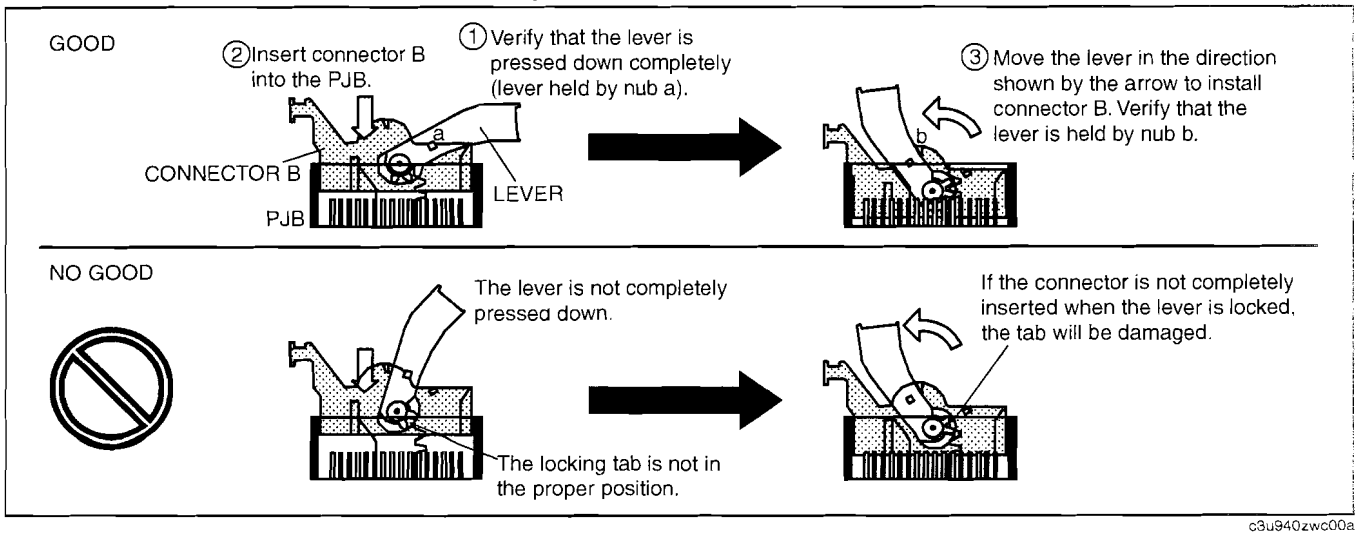
2. Remove the PJB as shown in the figure.



am3uuw0000086

Connector B Installation Note

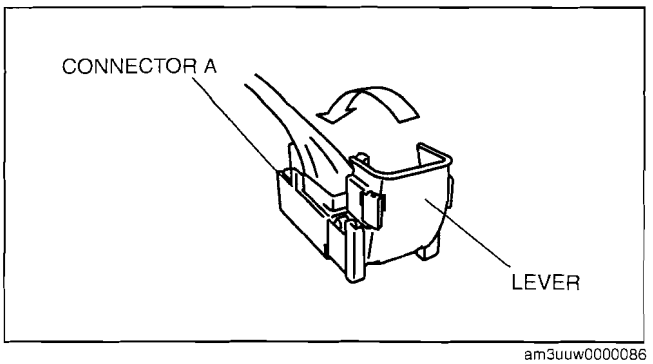
1. Install the connector B as shown in the figure.



c3u940zwc00a

Connector A Installation Note

1. After connecting the connector, rotate the lever in the direction of the arrow to install connector A.



am3uuw0000086

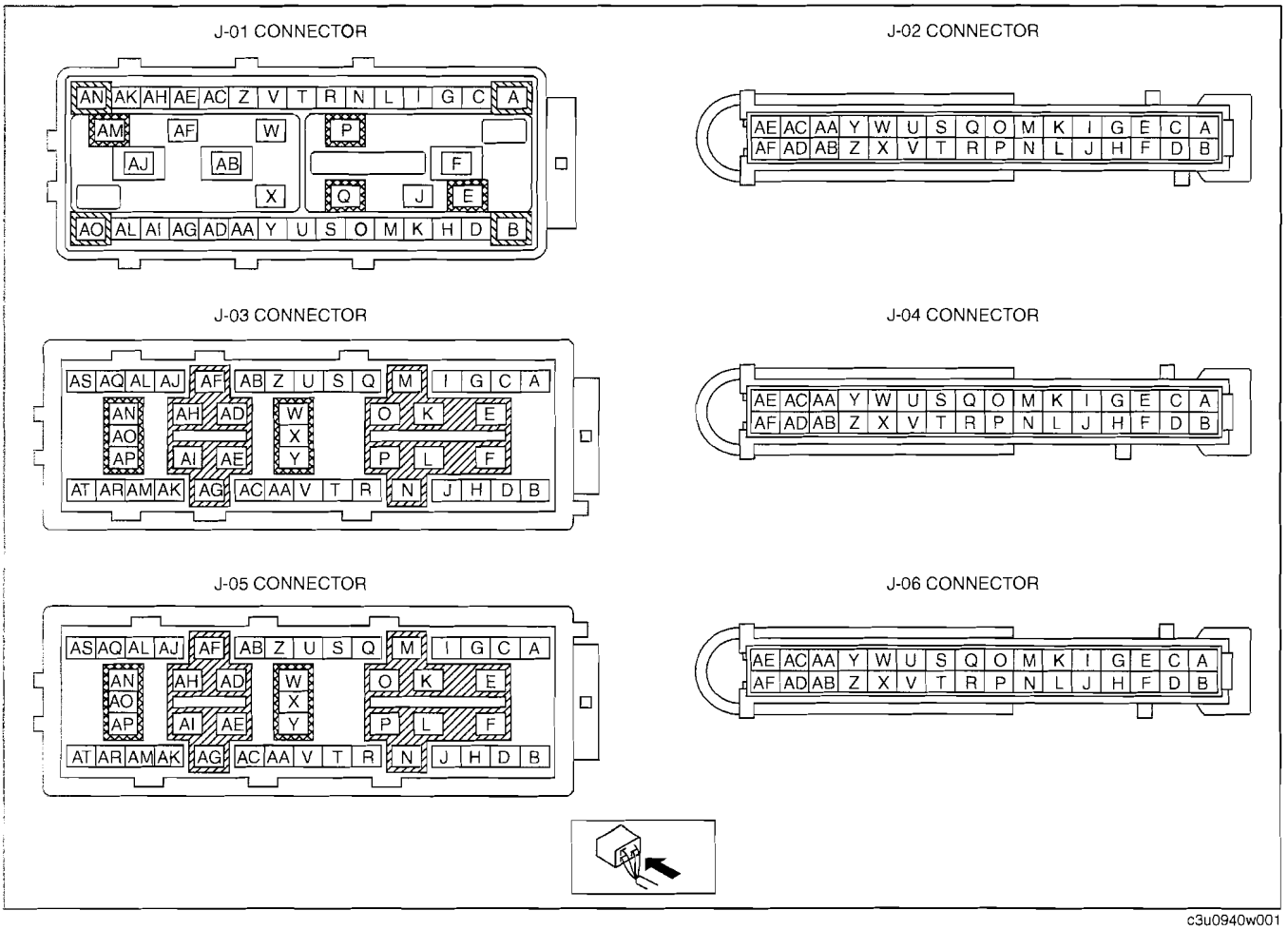
PASSENGER JUNCTION BOX (PJB) INSPECTION

id094000800600

Without Using the SST

1. Remove the glove compartment.
2. Remove the PJB with the connector connected.
3. Measure the voltage at each terminal and inspect for the continuity between the terminals and ground is as indicated in the Terminal Voltage Tables (Reference).
   - If the voltage or continuity is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item (s)".
     — If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the PJB.

Terminal voltage table (reference)



c3u0940w001

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-01 A	—	—	—		—	—
J-01 B	Power supply	Main fuse block	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-01 C*2	Headlight (RH) control	Headlight (RH) (low beam)	Light switch at headlight position		B+	• Headlight (RH) (low beam) • Related wiring harnesses
			Light switch off		1.0 or less	
J-01 D*2	Headlight (LH) control	Headlight (LH) (low beam)	Light switch at headlight position		B+	• Headlight (LH) (low beam) • Related wiring harnesses
			Light switch off		1.0 or less	
J-01 E	Windshield wiper motor control	Windshield wiper motor (high speed)	Wiper switch at high position		B+	• Windshield wiper motor • Related wiring harnesses
			Other		1.0 or less	
J-01 F	PJB power supply	Main fuse block	Under any condition		B+	• Related wiring harnesses
J-01 G	Blower relay, rear window defroster relay power supply	Blower relay, rear window defroster relay	Ignition switch at ON		B+	• Blower relay • Rear window defroster relay • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-01 H	Back-up light power supply	Back-up light switch	Ignition switch at ON		B+	• Back-up light switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-01 I	—	—	—		—	—
J-01 J	—	—	—		—	—
J-01 K	Parking light (RH) control	Parking light (RH)	Ignition switch off	Light switch at TNS position	B+	• Parking light (RH) • Related wiring harnesses
				Light switch at OFF position	1.0 or less	
J-01 L	Front turn light (RH) control	Front turn light (RH)	Turn switch (RH) on / Hazard warning switch on	Front turn light (RH) flashes	Alternates between 1.0 or less and B+	• Front turn light (RH) • Related wiring harnesses
			Other		1.0 or less	
J-01 M	High beam (RH) control	Headlight (RH) (high beam)	Ignition switch off	Light switch at high position or flash-to-pass	B+	• Headlight (RH) (high beam) • Related wiring harnesses
				Other	1.0 or less	
J-01 N	Heated outer mirror power supply	Rear window defroster relay	Rear window defroster switch on		B+	• Rear window defroster relay • Related wiring harnesses
			Rear window defroster switch off		1.0 or less	
J-01 O	High beam (LH) control	Headlight (LH) (high beam)	Ignition switch off	Light switch at high position or flash-to-pass	B+	• Headlight (LH) (high beam) • Related wiring harnesses
				Other	1.0 or less	
J-01 P	—	—	—		—	—
J-01 Q	Power supply	Main fuse block	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-01 R	PJB power supply	Main fuse block	Under any condition		B+	• Related wiring harnesses
J-01 S	—	—	—		—	—
J-01 T	—	—	—		—	—
J-01 U	—	—	—		—	—
J-01 V	Brake switch signal output	PCM	Brake pedal depressed		B+	• Brake switch • PCM • Related wiring
			Brake pedal released		1.0 or less	

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-01 W	—	—	—		—	—
J-01 X	—	—	—		—	—
J-01 Y	—	—	—		—	—
J-01 Z	—	—	—		—	—
J-01 AA*1	Headlight (LH) control	Headlight (LH) (low beam)	Light switch at headlight position		B+	• Headlight (LH) (low beam) • Related wiring harnesses
			Light switch off		1.0 or less	
J-01 AB	—	—	—		—	—
J-01 AC	Parking light (LH) control	Parking light (LH)	Ignition switch off	Light switch at TNS position	B+	• Parking light (LH) • Related wiring harnesses
				Light switch at OFF position	1.0 or less	
J-01 AD*1	Headlight (RH) control	Headlight (RH) (low beam)	Light switch at headlight position		B+	• Headlight (RH) (low beam) • Related wiring harnesses
			Light switch off		1.0 or less	
J-01 AE	Back-up light switch signal	• Back-up light switch (MTX) • TR switch (ATX)	Ignition switch at ON	Transaxle in reverse	B+	• Back-up light switch (MTX) • TR switch (ATX) • Related wiring harnesses
				Other	1.0 or less	
J-01 AF	—	—	—		—	—
J-01 AG	Windshield washer motor control	Windshield washer motor	Ignition switch at ON	Windshield washer switch on	B+	• Windshield washer motor • Related wiring harnesses
				Windshield washer switch off	1.0 or less	
J-01 AH	Rear window defroster relay control	Rear window defroster relay	Ignition switch at ON	Rear window defroster switch on	1.0 or less	• Rear window defroster relay • Related wiring harnesses
				Rear window defroster switch off	B+	
J-01 AI	Autostop switch signal	Autostop switch	Ignition switch at ON	Windshield wiper moving	B+	• Autostop switch (windshield wiper motor) • Related wiring harnesses
				Windshield wiper stopped	1.0 or less	
J-01 AJ	—	—	—		—	—
J-01 AK	Front turn light (LH) control	Front turn light (LH)	Turn switch (LH) on Hazard warning switch on	Front turn light (LH) flashes	Alternates between 1.0 or less and B+	• Front turn light (LH) • Related wiring harnesses
			Other		1.0 or less	
J-01 AL	Brake fluid level signal	Brake fluid level sensor	Ignition switch at ON	Brake fluid level above MIN.	B+	• Brake fluid level sensor • Related wiring harnesses
				Brake fluid level below MIN.	1.0 or less	
J-01 AM	PJB power supply	Main fuse block	Under any condition		B+	• Related wiring harnesses
J-01 AN	—	—	—		—	—
J-01 AO	Windshield wiper motor control	Windshield wiper motor (low speed)	Wiper switch at low position		B+	• Windshield wiper motor • Related wiring harnesses
			Other		1.0 or less	
J-02 A	—	—	—		—	—
J-02 B	—	—	—		—	—
J-02 C	—	—	—		—	—
J-02 D	—	—	—		—	—
J-02 E	—	—	—		—	—
J-02 F	—	—	—		—	—

CONTROL SYSTEM

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-02 G	—	—	—		—	—
J-02 H	—	—	—		—	—
J-02 I	—	—	—		—	—
J-02 J	—	—	—		—	—
J-02 K	—	—	—		—	—
J-02 L	—	—	—		—	—
J-02 M	—	—	—		—	—
J-02 N	—	—	—		—	—
J-02 O	—	—	—		—	—
J-02 P	—	—	—		—	—
J-02 Q	—	—	—		—	—
J-02 R	—	—	—		—	—
J-02 S	—	—	—		—	—
J-02 T	—	—	—		—	—
J-02 U	—	—	—		—	—
J-02 V	—	—	—		—	—
J-02 W*1	DRL control (high beam)	DRL relay	DRL mode		1.0 or less	• DRL relay • Related wiring harnesses
			Other		B+	
J-02 X	Front fog light relay control	Front fog light relay	Light switch at headlight position	Front fog light switch on	1.0 or less	• Front fog light relay • Related wiring harnesses
				Front fog light switch off	B+	
J-02 Y	Hood latch switch signal	Hood latch switch	Hood open (Hood latch switch off)		B+	• Hood latch switch • Related wiring harnesses
			Hood closed (Hood latch switch on)		1.0 or less	
J-02 Z	—	—	—		—	—
J-02 AA	—	—	—		—	—
J-02 AB	—	—	—		—	—
J-02 AC	—	—	—		—	—
J-02 AD	—	—	—		—	—
J-02 AE	—	—	—		—	—
J-02 AF	—	—	—		—	—
J-03 A	Shift lock solenoid control	Selector lever component	Selector lever shifted to P position and brake pedal depressed		B+	• Selector lever component • Related wiring harnesses
			Other		1.0 or less	
J-03 B	Washer switch signal	Windshield wiper and washer switch	Ignition switch at ON	Washer switch on	B+	• Windshield wiper and washer switch • Related wiring harnesses
				Washer switch off	1.0 or less	
J-03 C	PJB GND	Body ground	Under any condition: Inspect for continuity to ground.		Continuity detected	• Related wiring harnesses
J-03 D	—	—	—		—	—
J-03 E	—	—	—		—	—
J-03 F	—	—	—		—	—
J-03 G	Shift lock control	Selector lever component	Ignition switch at ON	Selector lever shifted to P position	1.0 or less	• Selector lever component • Related wiring harnesses
				Other	B+	
J-03 H	Illumination power supply	Illumination bulb	Light switch at TNS position		B+	• Related wiring harnesses
			Light switch at OFF position		1.0 or less	
J-03 I	TNS signal	Light switch	Light switch at TNS position		1.0 or less	• Light switch • Related wiring harnesses
			Light switch at OFF position		B+	

Terminal	Signal	Connected to	Measurement condition	Voltage (V)/ Continuity	Inspection item (s)
J-03 J	DLC-2 power supply	DLC-2	Under any condition	B+	• Related wiring harnesses
J-03 K	—	—	—	—	—
J-03 L	—	—	—	—	—
J-03 M	—	—	—	—	—
J-03 N	Washer motor power supply	• Windshield wiper and washer switch • Rear washer motor	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-03 O	—	—	—	—	—
J-03 P	Power supply	• Audio unit • Keyless control module • Car-navigation unit • Ignition key illumination bulb	Under any condition	B+	• Related wiring harnesses
J-03 Q	—	—	—	—	—
J-03 R	Climate control unit power supply	Climate control unit	Under any condition	B+	• Related wiring harnesses
J-03 S	—	—	—	—	—
J-03 T	Power supply	• Instrument cluster • Key interlock solenoid	Under any condition	B+	• Related wiring harnesses
J-03 U	—	—	—	—	—
J-03 V	—	—	—	—	—
J-03 W	—	—	—	—	—
J-03 X	PJB GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	• Related wiring harnesses
J-03 Y	Power supply	Ignition switch	Ignition switch at ACC	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-03 Z	—	—	—	—	—
J-03 AA	Power supply	• Audio unit • Car-navigation unit	Ignition switch at ACC	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-03 AB	Ignition key illumination control	Ignition key illumination	Ignition switch off and driver-side door opened.	1.0 or less	• Ignition key illumination bulb • Related wiring harnesses
			15 s or more after driver-side door closed.	B+	
J-03 AC	Power supply	Instrument cluster	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-03 AD	Power supply	Climate control unit	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-03 AE	—	—	—	—	—
J-03 AF	—	—	—	—	—
J-03 AG	—	—	—	—	—
J-03 AH	—	—	—	—	—

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-03 AI	Panel light control	Illumination bulb	Panel light control switch turned to the brightest setting		1.0 or less	• Each illumination bulb • Related wiring harnesses
			Panel light control switch turned to the darkest position	(See 09-40-13 Inspection using an oscilloscope (reference).)		
J-03 AJ	Panel light control input	Panel light control switch	Panel light control switch turned to the brightest setting		Approx. 4.5	• Panel light control switch • Related wiring harnesses
			Panel light control switch turned to the darkest position		1.0 or less	
J-03 AK	—	—	—		—	—
J-03 AL	Headlight leveling switch power supply	Headlight leveling switch	Light switch at headlight position		B+	• Headlight leveling switch • Related wiring harnesses
			Light switch at OFF position		1.0 or less	
J-03 AM	SAS control module power supply	SAS control module	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-03 AN	Cigarette lighter power supply	Cigarette lighter	Ignition switch at ACC		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-03 AO	Power supply	Ignition switch	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-03 AP	Power supply	Ignition switch	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-03 AQ	—	—	—		—	—
J-03 AR	—	—	—		—	—
J-03 AS	Headlight switch signal	Light switch	Light switch at headlight position		1.0 or less	• Light switch • Related wiring harnesses
			Light switch at OFF position		B+	
J-03 AT	—	—	—		—	—
J-04 A	—	—	—		—	—
J-04 B	CAN_L	—	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		—	• Related wiring harnesses
J-04 C	Windshield wiper switch signal (high)	Windshield wiper and washer switch	Ignition switch at ON	Windshield wiper switch at high position	1.0 or less	• Windshield wiper and washer switch • Related wiring harnesses
				Other	B+	
J-04 D	CAN_H	—	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		—	• Related wiring harnesses
J-04 E*3	Sensitivity adjustment volume	Windshield wiper and washer switch	Ignition switch at ON	Sensitivity adjustment volume turned from + position to – position	0 → 0.8 → 1.5 → 2.5 → 2.7	• Windshield wiper and washer switch • Related wiring harnesses
J-04 F	Keyless entry signal	Keyless control module	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		—	• Keyless control module • Related wiring harnesses
J-04 G	Windshield wiper switch signal (low)	Windshield wiper and washer switch	Ignition switch at ON	Windshield wiper switch at low position	1.0 or less	• Windshield wiper and washer switch • Related wiring harnesses
				Other	B+	
J-04 H	—	—	—		—	—

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-04 I	Rear window defroster signal	Climate control unit	Rear window defroster switch on		1.0 or less	• Climate control unit • Related wiring harnesses
			Rear window defroster switch off		B+	
J-04 J	—	—	—		—	—
J-04 K	Turn switch input (RH)	Turn switch	Ignition switch at ON	Turn switch at right position	1.0 or less	• Turn switch • Related wiring harnesses
				Other	B+	
J-04 L	Headlight switch signal (high beam)	Light switch	Light switch at high position or flash-to-pass		1.0 or less	• Light switch • Related wiring harnesses
			Other		B+	
J-04 M	—	—	—		—	—
J-04 N	Horn control	Horn relay	Transmitter LOCK button is pressed twice **within 5 s**.		B+ → 1.0 or less → B+	• Horn relay • Related wiring harnesses
			Other		B+	
J-04 O	Turn switch input (LH)	Turn switch	Ignition switch at ON	Turn switch at left position	1.0 or less	• Turn switch • Related wiring harnesses
				Other	B+	
J-04 P	—	—	—		—	—
J-04 Q	—	—	—		—	—
J-04 R	Rear wiper switch signal (on)	Rear wiper and washer switch	Ignition switch at ON	Rear wiper and washer switch at ON position	1.0 or less	• Rear wiper and washer switch • Related wiring harnesses
				Other	B+	
J-04 S	Rear wiper switch signal (INT)	Rear wiper and washer switch	Ignition switch at ON	Rear wiper and washer switch at INT position	1.0 or less	• Rear wiper and washer switch • Related wiring harnesses
				Other	B+	
J-04 T	—	—	—		—	—
J-04 U	Windshield wiper switch signal (INT)	Windshield wiper switch	Ignition switch at ON	Windshield wiper switch at INT position	1.0 or less	• Windshield wiper switch • Related wiring harnesses
				Other	B+	
J-04 V	Rear washer switch signal	Windshield wiper and washer switch	Ignition switch at ON	Rear washer switch on	1.0 or less	• Windshield wiper and washer switch • Related wiring harnesses
				Rear washer switch off	B+	
J-04 W	Front fog light switch signal	Front fog light switch	Front fog light switch on		1.0 or less	• Fog light switch • Related wiring harnesses
			Front fog light switch off		B+	
J-04 X	—	—	—		—	—
J-04 Y	—	—	—		—	—
J-04 Z	—	—	—		—	—
J-04 AA	—	—	—		—	—
J-04 AB	Parking brake switch signal	Parking brake switch	Ignition switch at ON	Parking brake switch on	1.0 or less	• Parking brake switch • Related wiring harnesses
				Parking brake switch off	B+	
J-04 AC	Hazard warning switch signal	Hazard warning switch	Hazard warning switch on		1.0 or less	• Hazard warning switch • Related wiring harnesses
			Hazard warning switch off		B+	
J-04 AD	Rear window defroster signal	Climate control unit	Rear window defroster switch is pressed		1.0 or less	• Climate control unit • Related wiring harnesses
			Rear window defroster switch is released		B+	
J-04 AE*3	Light switch signal (AUTO)	Light switch	Ignition switch at ON	Light switch at AUTO position	1.0 or less	• Light switch • Related wiring harnesses
				Other	B+	

Terminal	Signal	Connected to	Measurement condition		Voltage (V)/ Continuity	Inspection item (s)
J-04 AF	A/C operation signal	Climate control unit	A/C operating		1.0 or less	• Climate control unit • Related wiring harnesses
			A/C not operating		B+	
J-05 A	Rear turn light (LH) control	Rear turn light (LH)	Turn switch (LH) on	Rear turn light (LH) flashes	Alternates between 1.0 or less and B+	• Rear turn light (LH) • Related wiring harnesses
			Hazard warning switch on			
			Other		1.0 or less	
J-05 B	—	—	—		—	—
J-05 C	Back-up light control	Back-up light	Ignition switch at ON	Transaxle in reverse	B+	• Back-up light • Related wiring harnesses
				Other	1.0 or less	
J-05 D	—	—	—		—	—
J-05 E	Power outer mirror power supply	Power outer mirror	Ignition switch at ACC		B+	• Power outer mirror • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-05 F	Sunroof power supply	Sunroof	Under any condition		B+	• Sunroof • Related wiring harnesses
J-05 G	Tail light (LH) control	Tail light (LH)	Light switch at TNS position		B+	• Tail light (LH) • Related wiring harnesses
			Light switch at OFF position		1.0 or less	
J-05 H*3	Rain sensor GND	Rain sensor	Under any condition: Inspect for continuity to ground.		Continuity detected	• Related wiring harnesses
J-05 I*3	Auto stop switch signal	Rain sensor	Windshield wiper moving		B+	• Auto stop switch (windshield wiper motor) • Rain sensor • Related wiring harnesses
			Windshield wiper stopped		1.0 or less	
J-05 J	—	—	—		—	—
J-05 K	—	—	—		—	—
J-05 L	Driver-side door unlock control	Driver-side door lock actuator	Driver-side door lock actuator unlocking		1.0 or less → B+ → 1.0 or less	• Driver-side door lock actuator • Related wiring harnesses
			Other		1.0 or less	
J-05 M	Brake switch signal	Brake switch	Brake pedal depressed		B+	• Brake switch • Related wiring harnesses
			Brake pedal released		1.0 or less	
J-05 N	—	—	—		—	—
J-05 O	—	—	—		—	—
J-05 P	—	—	—		—	—
J-05 Q	—	—	—		—	—
J-05 R	—	—	—		—	—
J-05 S	Interior light power supply	• Map light • Interior light • Trunk compartment light • Cargo compartment light	Under any condition		B+	• Related wiring harnesses
J-05 T*3	Rain sensor power supply	Rain sensor	Ignition switch at ON		B+	• Ignition switch • Related wiring harnesses
			Ignition switch off		1.0 or less	
J-05 U	Interior light control	• Map light • Interior light	**Within 5 min** after any door is opened.		1.0 or less	• Map light • Interior light • Related wiring harnesses
			5 min or more after any door is opened.		B+	
			All doors closed		1.0 or less	

Terminal	Signal	Connected to	Measurement condition	Voltage (V)/ Continuity	Inspection item (s)
J-05 V	—	—	—	—	—
J-05 W	—	—	—	—	—
J-05 X	—	—	—	—	—
J-05 Y	Door unlock control	Door lock actuator	Door lock actuator unlocking	1.0 or less → B+ → 1.0 or less	• Door lock actuator • Related wiring harnesses
			Other	1.0 or less	
J-05 Z	Heated outer mirror control	Heated outer mirror	Rear window defroster switch on	B+	• Heated outer mirror • Related wiring harnesses
			Rear window defroster switch off	1.0 or less	
J-05 AA	—	—	—	—	—
J-05 AB	—	—	—	—	—
J-05 AC	SWS power supply	SWS	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-05 AD	—	—	—	—	—
J-05 AE	—	—	—	—	—
J-05 AF	—	—	—	—	—
J-05 AG	—	—	—	—	—
J-05 AH	—	—	—	—	—
J-05 AI	—	—	—	—	—
J-05 AJ	—	—	—	—	—
J-05 AK	Rear turn light (RH) control	Rear turn light (RH)	Turn switch (RH) on / Hazard warning switch on — Rear turn light (RH) flashes	Alternates between 1.0 or less and B+	• Rear turn light (RH) • Related wiring harnesses
			Other	1.0 or less	
J-05 AL	Sunroof power supply	Sunroof	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-05 AM	—	—	—	—	—
J-05 AN	Power window power supply	Power window switch (RH)	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-05 AO	Power window power supply	Power window switch (LH)	Ignition switch at ON	B+	• Ignition switch • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-05 AP	Door lock control	Door lock actuator	Door lock actuator locking	1.0 or less → B+ → 1.0 or less	• Door lock actuator • Related wiring harnesses
			Other	1.0 or less	
J-05 AR	Rear wiper control	Rear wiper motor	Rear wiper moving	B+	• Rear wiper motor • Related wiring harnesses
			Rear wiper stopped	1.0 or less	
J-05 AS	Tail light (RH) control	Tail light (RH)	Light switch at TNS position	B+	• Tail light (RH) • Related wiring harnesses
			Light switch at OFF position	1.0 or less	
J-05 AT	Rear wiper power supply	Rear wiper motor	Ignition switch at ON	B+	• Rear wiper motor • Related wiring harnesses
			Ignition switch off	1.0 or less	
J-06 A	—	—	—	—	—
J-06 B	—	—	—	—	—
J-06 C	—	—	—	—	—
J-06 D	—	—	—	—	—
J-06 E	—	—	—	—	—
J-06 F	—	—	—	—	—
J-06 G	—	—	—	—	—
J-06 H	—	—	—	—	—

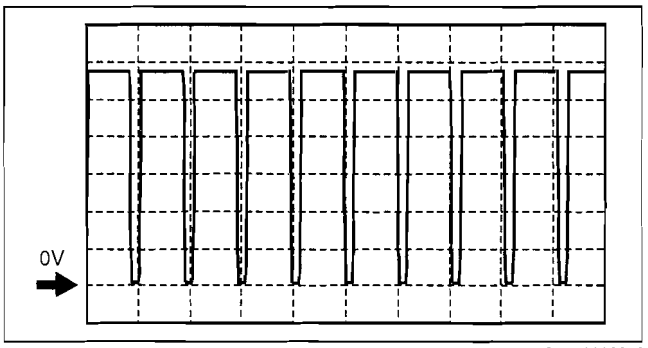
Terminal	Signal	Connected to	Measurement condition	Voltage (V)/ Continuity	Inspection item (s)
J-06 I	—	—	—	—	—
J-06 J	—	—	—	—	—
J-06 K	—	—	—	—	—
J-06 L	—	—	—	—	—
J-06 M	—	—	—	—	—
J-06 N	—	—	—	—	—
J-06 O	—	—	—	—	—
J-06 P	Trunk lid lock/unlock signal	Trunk lid key cylinder switch	At the moment key cylinder is unlocked	1.0 or less	• Trunk lid key cylinder switch • Related wiring harnesses
			At the moment key cylinder is locked	Approx. 3	
			Key cylinder at neutral position	B+	
J-06 Q	Rear door latch switch (RH) signal	Rear door latch switch (RH)	Rear door (RH) open (Rear door latch switch (RH) off)	B+	• Rear door latch switch (RH) • Related wiring harnesses
			Rear door (RH) closed (Rear door latch switch (RH) on)	1.0 or less	
J-06 R	—	—	—	—	—
J-06 S	Rear door latch switch (LH) signal	Rear door latch switch (LH)	Rear door (LH) open (Rear door latch switch (LH) off)	B+	• Rear door latch switch (LH) • Related wiring harnesses
			Rear door (LH) closed (Rear door latch switch (LH) on)	1.0 or less	
J-06 T	Lock/unlock signal	Door lock switch	Door lock switch is pressed to lock.	Approx. 2	• Door lock switch • Related wiring harnesses
			Door lock switch is pressed to unlock.	1.0 or less	
			Other	B+	
J-06 U	Front door latch switch (RH) signal	Front door latch switch (RH)	Front door (RH) open (Front door latch switch (RH) off)	B+	• Front door latch switch (RH) • Related wiring harnesses
			Front door (RH) closed (Front door latch switch (RH) on)	1.0 or less	
J-06 V	Unlock input (Driver-side door lock-link switch)	Driver-side door lock-link switch	Driver-side door locked	B+	• Driver-side door lock-link switch • Related wiring harnesses
			Driver-side door unlocked	1.0 or less	
J-06 W	Front door latch switch (LH) signal	Front door latch switch (LH)	Front door (LH) open (Front door latch switch (LH) off)	B+	• Front door latch switch (LH) • Related wiring harnesses
			Front door (LH) closed (Front door latch switch (LH) on)	1.0 or less	
J-06 X*5	Liftgate latch switch signal	Liftgate latch switch	Liftgate open (Liftgate latch switch on)	1.0 or less	• Liftgate latch switch • Related wiring harnesses
			Liftgate closed (Liftgate latch switch off)	B+	
J-06 Y	Lock input (Driver-side door key cylinder switch)	Driver-side door key cylinder switch	At the moment key cylinder is locked	1.0 or less	• Driver-side door key cylinder switch • Related wiring harnesses
			Other	B+	
J-06 Z*4	Trunk lid latch switch signal	Trunk lid latch switch	Trunk lid open (Trunk lid latch switch on)	1.0 or less	• Trunk lid latch switch • Related wiring harnesses
			Trunk lid closed (Trunk lid latch switch off)	B+	
J-06 AA	Unlock input (Driver-side door key cylinder switch)	Driver-side door key cylinder switch	At the moment key cylinder is unlocked	1.0 or less	• Driver-side door key cylinder switch • Related wiring harnesses
			Other	B+	
J-06 AB	—	—	—	—	—
J-06 AC	Lock input (Driver-side door lock-link switch)	Driver-side door lock-link switch	Driver-side door locked	1.0 or less	• Driver-side door lock-link switch • Related wiring harnesses
			Driver-side door unlocked	B+	

Terminal	Signal	Connected to	Measurement condition	Voltage (V)/ Continuity	Inspection item (s)
J-06 AD	Wiper or headlight operation request	Rain sensor	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.	—	• Rain sensor • Related wiring harnesses
J-06 AE	—	—	—	—	—
J-06 AF	—	—	—	—	—

*1 : With DRL
*2 : Without DRL
*3 : With auto light and auto wiper system
*4 : 4 door
*5 : 5 door

Inspection using an oscilloscope (reference)
Panel light control

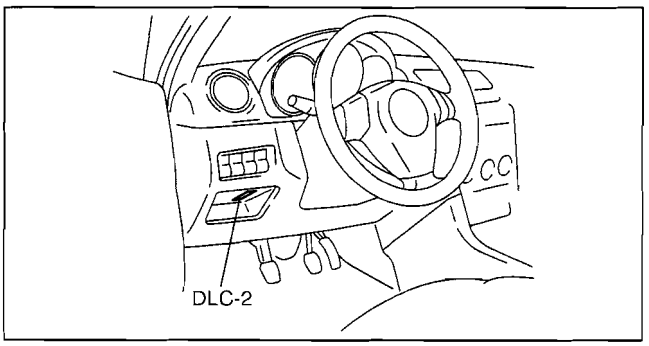
- Terminal connected: J-03 AI (+)—Negative battery terminal
- Oscilloscope setting: 2 V/DIV (Y): 5 ms/DIV (X), DC range
- Measurement condition: Panel light control switch turned to the darkest position.



am3uuw0000052

Using SST (M-MDS)

1. Connect the M-MDS to the DLC-2 connector.
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     — Select the "Toolbox" tab.
     — Select "DataLogger".
     — Select "Modules".
     — Select "GEM".
   - When using the PDS (Pocket PC)
     — Select "Module Tests".
     — Select "GEM".
     — Select "DataLogger".
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.



am3uuw0000052

Note

- The PID data screen function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually.

×: Applicable

PID/data monitor item	Unit/ Condition (Tester display)	Input/output part	PJB terminal	Parts No.			M-MDS menu										
				BN8D	BN8B	BN8S	Body - Glass - Heated Backlight	Body - Instrument Panel and Console - Warning Lamps / Chimes	Body - Latching - Power Door Locks	Body - Security - Perimeter	Electrical - Crimate Control	Electrical - Interior Lighting - Illuminated Entry	Electrical - Exterior Lighting	Electrical - Washer / Wiper - Front	Electrical - Washer / Wiper - Rear	Module - GEM
ACSW	On/Off	Climate control unit (A/C switch)	J-04 AF		×	×					×					×
ALARM1	*1	Last alarm trigger	—		×	×				×						×
ALARM2		Previous alarm trigger 1	—		×	×				×						×
ALARM3		Previous alarm trigger 2	—		×	×				×						×
ALARM4		Previous alarm trigger 3	—		×	×				×						×
AT_HORN	On/Off	Horn relay	J-04 N		×	×				×						×
AUTOLMP	On/Off	Light switch (AUTO)	J-04 AE		×	×		×					×			×
B_AJAR	Open/ Closed	Bonnet switch	J-02 Y		×	×			×	×						×
BACKUPLMP	On/Off	Back-up light switch	J-01 AE		×	×							×			×
BRK_FLUID	Low/Normal	Brake fluid level sensor	J-01 AL	×	×	×		×								×
C_LOCK_SW	Active/ Inactive	Door lock switch	J-06 T	×	×	×			×	×						×
C_UNLOCK_SW	Active/ Inactive	Door lock switch	J-06 T	×	×	×			×	×						×
CCNT_GE	—	DTC	—	×	×	×	×	×	×	×	×	×	×	×	×	×
DD_LOCK	Active/ Inactive	Driver-side door lock-link switch	J-06 AC	×	×	×			×	×						×
DD_UNLK	Active/ Inactive	Driver-side door lock-link switch	J-06 V	×	×	×			×	×						×
DD_UNLOCK	On/Off	Door lock actuator (driver-side)	J-05 L	×	×	×			×	×						×
DLIDLKSW	Active/ Inactive	Trunk lid key cylinder switch	J-06 P		×	×			×							×
DLIDULKSW	Active/ Inactive	Trunk lid key cylinder switch	J-06 P		×	×			×							×
DRL_L	On/Off	Headlight (LH)	J-01 AA			×							×			×
DRL_R	On/Off	Headlight (RH)	J-01 AD			×							×			×
DRLK_RLY	On/Off	Door lock actuators (lock)	J-05 AP	×	×	×			×							×
DRUNLK_RLY	On/Off	Door lock actuators (unlock)	J-05 Y	×	×	×			×							×
F_FOG_LMP	On/Off	Fog light switch	J-04 W		×	×		×					×			×
FOGRLY_F	On/Off	Fog light	J-02 X		×	×		×					×			×
GEM_VBAT	Volt	Battery	J-01 F, J-03 AP	×	×	×	×	×	×	×	×	×	×	×	×	×
HAZARD	On/Off	Hazard warning switch	J-04 AC	×	×	×		×								×
HBEAMSW	On/Off	Light switch (high beam)	J-04 L	×	×	×		×					×			×
HEADLAMP	On/Off	Light switch (low beam)	J-03 AS		×	×							×			×
IGKEY_ILLU	On/Off	Ignition key illumination	J-03 AB	×	×	×						×				×
INTLIGHT	On/Off	Interior Lights	J-05 U	×	×	×						×				×
LBEAM_AUTO	On/Off	Headlight	J-01 C, J-01 D		×	×							×			×

PID/data monitor item	Unit/ Condition (Tester display)	Input/output part	PJB terminal	Parts No.			M-MDS menu									
				BN8D	BN8B	BN8S	Body - Glass - Heated Backlight	Body - Instrument Panel and Console - Warning Lamps / Chimes	Body - Latching - Power Door Locks	Body - Security - Perimeter	Electrical - Crimate Control	Electrical - Interior Lighting - Illuminated Entry	Electrical - Exterior Lighting	Electrical - Washer / Wiper - Front	Electrical - Washer / Wiper - Rear	Module - GEM
LBEAMSW	On/Off	Headlight	J-01 C, J-01 D			×							×			×
LF_AJAR	Open/ Closed	Front door latch switch (LH)	J-06 W	×	×	×		×	×	×		×				×
LHTURN_IND	On/Off	Turn light (LH)	J-01 AK	×	×	×		×								×
LHTURN_SW	On/Off	Turn switch (LH)	J-04 O	×	×	×		×								×
LR_AJAR	Open/ Closed	Rear door latch switch (LH)	J-06 S	×	×	×		×	×	×		×				×
PARK_LAMP	On/Off	• Parking light • License plate light	J-01 K, J-01 AC, J-05 AS, J-05 G		×	×							×			×
PARK_SW	On/Off	Light switch (TNS)	J-03 I	×	×	×							×			×
PNLCON_SW	Ohm	Panel light control switch	J-03 AJ	×	×	×		×				×				×
PRK_BRK	On/Off	Parking brake switch	J-04 AB	×	×	×		×								×
PWM_ILLU	On/Off	Illumination lights	J-03 AI	×	×	×		×				×				×
RDEF_IND	On/Off	Climate control unit (rear window defroster indicator)	J-04 I	×	×	×	×	×							×	×
RDEF_SW	On/Off	Climate control unit (rear window defroster switch)	J-04 AD	×	×	×	×	×							×	×
RDEFRLY	On/Off	Rear window defroster relay	J-01 N	×	×	×	×	×							×	×
RESET_SW	Active/ Inactive	Driver-side door key cylinder switch	J-06 AA	×	×	×			×							×
RF_AJAR	Open/ Closed	Front door latch switch (RH)	J-06 U	×	×	×		×	×	×		×				×
RHTURN_IND	On/Off	Front turn light (RH)	J-01 L	×	×	×		×								×
RHTURN_SW	On/Off	Turn switch (RH)	J-04 K	×	×	×		×								×
RR_AJAR	Open/ Closed	Rear door latch switch (RH)	J-06 Q	×	×	×		×	×	×		×				×
SET_SW	Active/ Inactive	Driver-side door key cylinder switch	J-06 Y	×	×	×			×							×
T_AJAR	Open/ Closed	Liftgate latch switch	J-06 X		×	×			×	×		×				×
TRUNK_AJAR	Open/ Closed	Trunk lid latch switch	J-06 Z		×	×			×	×		×				×
WASH_FRT	On/Off	Windshield wiper and washer switch (washer)	J-03 B	×	×	×								×		×
WPFAST_FRT	On/Off	Windshield wiper and washer switch (high)	J-04 C		×	×								×		×
WPINT_FRT	On/Off	Windshield wiper and washer switch (INT or AUTO)	J-04 U	×	×	×								×		×
WPINT_REAR	On/Off	Rear wiper and washer switch (INT)	J-04 S		×	×									×	×

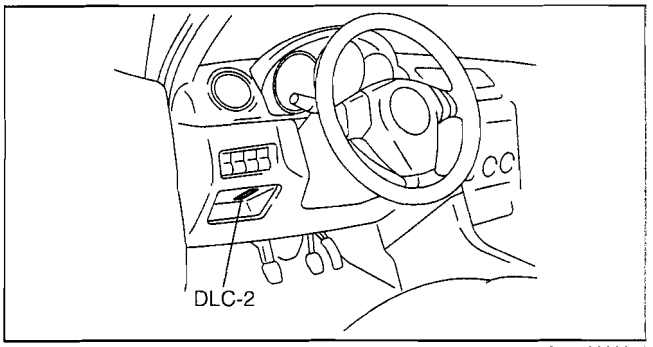
PID/data monitor item	Unit/ Condition (Tester display)	Input/output part	PJB terminal	Parts No.			M-MDS menu									
				BN8D	BN8B	BN8S	Body - Glass - Heated Backlight	Body - Instrument Panel and Console - Warning Lamps / Chimes	Body - Latching - Power Door Locks	Body - Security - Perimeter	Electrical - Crimate Control	Electrical - Interior Lighting - Illuminated Entry	Electrical - Exterior Lighting	Electrical - Washer / Wiper - Front	Electrical - Washer / Wiper - Rear	Module - GEM
WPRLY_FAST	On/Off	Windshield wiper motor (high speed)	J-01 E		×	×								×		×
WPRLY_LOW	On/Off	Windshield wiper motor (low speed)	J-01 AO	×	×	×								×		×
WPRLY_REAR	On/Off	Rear wiper and washer switch (on)	J-04 R		×	×									×	×
WPRPRKSTS	Open/ Closed	Windshield wiper motor (auto stop switch)	J-01 AI	×	×	×								×		×
WPSW_FRT	On/Off	Windshield wiper and washer switch (low)	J-04 G	×	×	×								×		×

*1 :

- BAT_CONN: Battery reconnection
- IGON_WOKEY: IG on without the key
- KEYCYL_UNLK: Key cylinder unlock
- LKKNOB_UNLK: Lock knob unlock
- CLKSW_UNLK: Central lock switch unlock
- RR_AJAR: Right rear door ajar
- RL_AJAR: Left rear door ajar
- PASS_AJAR: Passenger door ajar
- DRV_AJAR: Driver door ajar
- T_AJAR: Trunk/liftgate ajar
- B_AJAR: Hood ajar
- INTR_SENS: Intruder sensor
- BBS_TAMP: Battery backup siren tamper

PASSENGER JUNCTION BOX (PJB) CONFIGURATION

id094000800500



am3uuw0000051

1. Connect the M-MDS to the DLC-2 (16-pin).
2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
   When using the IDS (laptop PC)
   - Select "Module Programming".

   When using the PDS (Pocket PC)
   - Select "Programming".
   - Select "Module Programming".
3. Then, select items from the screen menu in the following order.
   1. Select "Programmable Module Installation".
   2. Select "GEM".
4. Perform the configuration according to the directions on the screen.
5. select items from the screen menu in the following order.
   1. Select "Programmable Parameters".
   2. Select "GEM".
   3. Select "Module Reset".
6. Perform procedures according to the directions on the screen.
7. Retrieve DTCs using the M-MDS and verify that there is no DTC present.
   - If any DTC is present, perform applicable DTC inspection. (See 09-02E-2 DTC TABLE (PJB)[CONTROL

09-50 TECHNICAL DATA

BODY ELECTRICAL SYSTEM

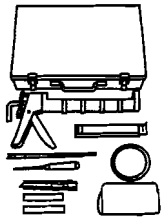
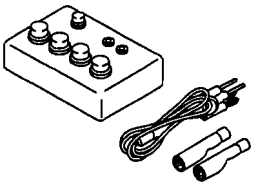
id095000800200

Item		Specifications (W) × number
Exterior light bulb capacity	Headlight bulb (high-beam)	60 × 2
	Discharge headlight bulb (low-beam)	35 × 2
	Halogen headlight bulb (low-beam)	55 × 2
	Front turn light bulb	27 × 2
	Parking light bulb	8 × 2
	Front fog light bulb	55 × 2
	Front side turn light bulb	5 × 2
	Brake/taillight bulb (LED)	21/5 × 2 (4/0.4)
	Rear turn light bulb	21 × 2
	Back-up light bulb	21 × 2
	Rear side marker light bulb	0.57 × 2
	License plate light bulb	5 × 1
	High-mount brake light bulb	18 × 1
Interior light bulb capacity	Map light bulb	5 × 2
	Interior light bulb	10 × 1
	Trunk compartment light bulb	5 × 1
	Cargo compartment light bulb	5 × 1
	Glove compartment light bulb	1.7 × 1
	Ignition key illumination bulb	1.4 × 1
	Ashtray illumination bulb	1.4 × 1

09-60 SERVICE TOOLS

BODY AND ACCESSORIES SST

id096000800100

49 0305 870A Window Tool Set 	49 N088 0A0 Fuel & Thermometer Checker 	-

ALPHABETICAL INDEX

AI SECTION

A

ALPHABETICAL INDEX

B

C

AI

ALPHABETICAL INDEX

D

E

F

AI

G

H

I

J

K

L

M

N

O

P

ALPHABETICAL INDEX

Q

R

S

T

U

V

W

AI

ALPHABETICAL INDEX